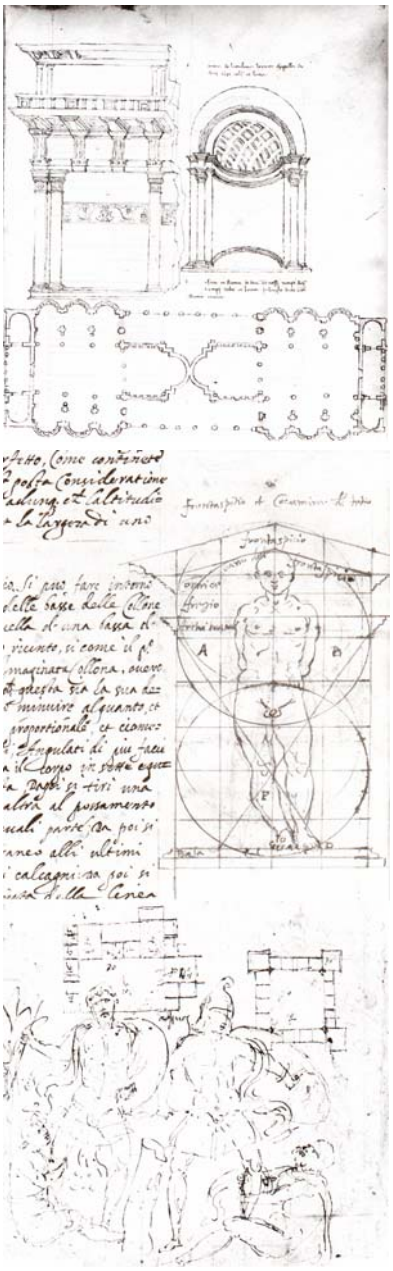
ARS ET INGENIUM:
THE EMBODIMENT OF IMAGINATION IN THE ARCHITECTURAL DRAWINGS OF FRANCESCO DI GIORGIO MARTINI



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ARS ET INGENIUM: THE EMBODIMENT OF IMAGINATION IN THE ARCHITECTURAL DRAWINGS OF FRANCESCO DI GIORGIO MARTINI

This study focuses on the work of the Renaissance architect and theorist Francesco di Giorgio Martini (1439-1501), particularly on his *Trattati di architettura, ingegneria e arte militare* (1475-1490). The characteristics of the act of drawing and its connection to architectural imagination as defined by Francesco are the two themes that structure the inquiry.

In addition to an abundant number of captivating drawings which accompany the text, Francesco writes about the reason why drawings are to be used, and what role they have in conveying ideas and images to the reader of his theories. While in the context of the Quattrocento Francesco's use of drawings is not necessarily a novelty, his formulation of drawing as the main vehicle for architectural thought is distinctive. He offers a unique format for architectural theory, rooted in classical and medieval traditions, and yet original in its annexation of text and drawings. His thoughts on *disegno* (connoting both design and drawing) prove him vocal in highlighting the role of drawing in an architectural process.

Francesco suggests that creativity, invention and imagination are all quintessential elements at work in *disegno*. He identifies both intellect and the senses, especially sight, as providing the criteria of judgment in architecture. His drawings combine elements of the past, insights of the present and anticipations of things yet to come by engaging memory, sense, the intellect and the imagination. In the *Trattati* drawing becomes a fertile field for infinitely dynamic investigations, by acting as a vehicle for the architect's inquires as well as a vessel for conversations with others.

Examining Francesco's work within the two frequently intersecting lines of drawing and imagination enable us to better formulate our expectations of architectural drawings, in the midst of a significant shift in architectural practice caused by the proliferation of digital media.

ARS ET INGENIUM: L'INCARNATION DE L'IMAGINATION DANS LES DESSINS ARCHITECTURAUX DE FRANCESCO DI GIORGIO

Cette étude se concentre sur les travaux de l'architecte et théoricien de la Renaissance, Francesco di Giorgio Martini (1439-1501), en particulier sur son traité: *Trattati di architettura, ingegneria e arte militare* (1475-1490). Les caractéristiques de l'acte de dessiner et de sa connexion à l'imagination architecturale telle que définie par Francesco sont les deux thèmes qui structurent cette étude.

En plus d'un grand nombre de dessins fascinants qui accompagnent le texte, Francesco décrit les raisons pour lesquelles les dessins doivent être utilisés, et le rôle qu'ils jouent dans la transmission des idées et des images au lecteur de ses théories. Dans le contexte du Quattrocento, l'utilisation des dessins par Francesco n'est pas nécessairement une nouveauté, par contre la mise en valuer du dessin comme médium principal de la pensée architecturale est unique. Francesco crée un format unique pour sa théorie architecturale, ancré dans les traditions classiques et médiévales, et pourtant original dans son annexion des dessins au texte. Ses réflexions sur *disegno* (portant à la fois sur la conception et le dessin) en font un partisan de la mise en évidence du rôle du dessin dans un processus architectural.

Francesco suggère que la créativité, l'invention et l'imagination sont toutes des éléments essentiels à l'œuvre pour parvenir à *disegno*. Il identifie à la fois l'intellect et les sens, surtout la vue comme fournissant les critères de jugement pour l'architecture. Ses dessins combinent les éléments du passé, le savoir du présent et les anticipations du futur en mettant en jeu la mémoire, les sens, l'intellect et l'imagination. Les dessins du *Trattati* deviennent un terrain fertile pour des recherches infiniment dynamiques, en agissant comme un vecteur pour les investigations de l'architecte ainsi qu'un médium pour des conversations avec d'autres.

Etudier le travail de Francesco selon les deux lignes, qui se coupent fréquemment, du dessin et de l'imagination, nous permettra de mieux formuler nos attentes vis-à-vis du dessin architectural, dans le contexte d'une transformation majeure liées au développement des médias numériques.

ACKNOWLEDGEMENTS

My first reaction to Francesco di Giorgio's drawings was a mixture of amazement and disbelief, since they seemed utterly different from the works of more familiar Renaissance artists and architects. During the time it took me to articulate my understanding of his work, I had to educate myself by undertaking a journey through the Renaissance, departing many times from Francesco before I returned to focus on him once more.

Throughout this journey, I have benefited from the guidance of Prof. Alberto Pérez-Gómez. I took his courses as an undergraduate, and returned to McGill for the Master's degree program, at which point I realized that I longed to benefit from his wisdom and insight. As my advisor, he had a central role in directing me and ensuring that I completed the journey, and for this I am much indebted to him. I will cherish the memory of our discussions in his sun-lit office. His understanding of history and theory of architecture resonates deeply with my preoccupations and questions, and I cannot thank him enough for his inquiry, advice and erudition.

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The presence of my friends and peers at McGill has been invaluable during the early phases of my study. Among them, I must thank Diana Cheng, Nicholas Roquet, and Kalandar Kamalkhan, who at different stages provided moral and intellectual support. My departure from Montreal made me long for their presence and comments exceedingly. My friend and colleague Negin Djavaherian has been a constant support in the past six years. Each time we reminisced about the past, we rediscovered our friendship anew. Her help and friendship are priceless to me.

In the last three years of my PhD studies, I had the privilege to teach part-time at the Rhode Island School of Design. I am grateful to Prof. Lynnette Widder, who trusted me to teach critical courses focused on drawing and design, and I have much appreciated my exchanges with Prof. Kyna Leski, Prof. Silvia Acosta, and Prof. Shayne O'Neil on architectural drawings. The experience of teaching the many students who participated in my drawing and studio classes was an intense and vital one. During my stay in Cambridge, I audited an MIT seminar on architectural drawing taught by Prof. David Friedman. Prof. Friedman's patience and generosity, together with his knowledge and interest in drawings, were a sanctuary for me. Prof. Mark Jarzombek at MIT and Prof. James Ackerman at Harvard University both discussed my subject matter with me in the early phases of my PhD and have been kind and generous with their time.

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My colleague Dr. Lawrence Bird polished the English and commented on the final version of the dissertation. I have much enjoyed his comments and am thankful for his help.

Ultimately, this journey was made possible by the love and support of three people, who are the treasures of my life. Thanks go to Zarvan, for his wit and his oblique encouragements. Although not a Renaissance enthusiast, our many discussions on literature and life were a constant source of pleasure. Yahya gave his love and support. He read over my manuscripts many times and commented on the content, and often turned my tears to smiles. As this dissertation is as old as our life together, I can only wish the latter will continue for a lifetime. To him goes my love and affection. My deepest love and gratitude goes to Fereshteh, without whom I would have never done any of the things I have undertaken. Her trust in me, her encouragement and the sense of the world that she has instilled in me, make for the most precious gift I have received next to the gift of life she gave me.

PREAMBLE

PREAMBLE

The exceptional position of Francesco di Giorgio Martini (1439-1501) in recognizing the act of drawing as the main medium and impetus for generating and fortifying architectural thought during the Italian Renaissance has often been overlooked. Besides his paintings, sculptures, fortifications, and architectural projects, his critical contribution to the theory of architecture, *Trattati di architettura, ingegneria e arte militare*, incorporates a regular pairing of text with drawings. The abundance and uniqueness of drawings in the *Trattati* reveal that Francesco recognized the potential power of drawing beyond mere illustration, and used drawing both as a creative mode of inquiry and a vehicle for communication. Some of his drawings in the *Trattati* empower his theories while exposing us to a complex and challenging worldview that highlights specific architectural elements, and engages our imagination by the superimposition of multiple elements and layers. Although his use of drawings in itself is not a novelty, the fact that he used drawings to embody architectural thought is original. Compared to his theoretical counterparts Alberti and Filarete, Francesco promoted the primacy of draftsmanship explicitly and effectively.

The manifold nature of the term *disegno* in the context of Quattrocento is the primary subject of the first chapter. On one hand *disegno* pertains to draftsmanship and means drawing in some instances, on the other hand *disegno* has the connotation of designing or drawing an idea in the mind, and sometimes it only refers to the pure idea. In other words, in the context of the Quattrocento *disegno* is either verbal or visual or both; it sometimes is a means to an end or the end itself, the process or the product, or a combination of the two. Uniting the themes of drawing and imagination in the title of the present dissertation suggests a twofold cycle of events. One is the conception of the

disegno in the mind of the architect and its translation into drawing, which is an intermediary state between the idea and the built work. The other is the potential of *disegno*, be it the reader's understanding of the theory or idea, or the functional role of the drawing as the medium through which the act of building becomes realized. That is: *disegno* in its capacity to convey or communicate. Instead of tending to Francesco's entire body of work, the present dissertation focuses on these particular aspects of his work. Building upon previous studies, dissertations, and articles on Francesco, the choice of narrowly focusing on the subject of his drawings and their connection to imagination seems appropriate. The dissertation argues that Francesco's unique position as a theoretician, draughtsman and architect sets him apart from his counterparts in this respect – a fact which has been largely unnoticed.

Francesco's major contribution to the architectural theory of the Renaissance is neither his translation of Vitruvius, nor his theory of human analogy, nor even his machine designs as separate entities. Rather, his greatest accomplishment is his use of drawing, combined with text, as the primary means for the architect to investigate, advance, and realize a project. The propagation of Francesco's drawings, which were copied, transformed, and adopted in the Renaissance, and surpassed his theoretical work in both longevity and status, confirms this argument. The present work is not an historical survey but rather an interpretive study that undertakes a reading of Francesco's *Trattati* and other works of the *Quattrocento* in the hope of retracing what made drawing so relevant and central to the process of imagining architecture.

The present work demonstrates how Francesco and his contemporaries explored and used drawing outside the boundaries of mere illustration. Their endeavours are particularly useful for us to remember, since architectural drawings are generated these days in such a way that the architect has partially lost control over the imaginative process. The gradual loss of working with the most tangible medium, through which architecture has thrived for centuries, is alarming and worthy of close study. Our moment of uncertainty vis-à-vis the propagation of digital media resonates with the time of the Renaissance, with its postulation of *perspectiva artificialis* and all the debates that the new method unleashed. In parallel with *perspectiva artificialis*, orthographic modes of projection attained a certain level of precision and became part of the process of designing and building during the Renaissance. As well, parallel three-dimensional projections, manifested in architectural drawings and extensively in drawings of machines and fortifications, became more sophisticated and significant in representing and exposing qualities and characteristics of objects and spaces.

This work is an investigation of the fertile field of architectural theory during the Quattrocento, a time during which many things were tested, tried, and developed with regard to drawing. Thus, the Quattrocento is understood as an intermediary period between the intuitive attitude of architects' and artists' towards drawing during the Trecento, and the more established poise and certainty of the Cinquecento architects and artists. Looking at this era of change will help us comprehend our current dilemmas about the potentials and possibilities inherent in the act of drawing and retrieve its essence, which has become lost amid ever-changing new means of representation.

The dissertation comprises a preamble, four chapters, and a postscript, through which the subject matter is studied from different angles. The dissertation essentially is divided into two different parts. Part one aims at presenting Francesco's impact as the writer of text (chapter one), and a text that has a unique format as it is accompaniment by drawings (chapter two). Part two dwells on the drawings themselves. It establishes the connection between thoughts and their manifestation in drawn form (chapter three), the intention and form of drawings as part of the page and engages in a closer study of a series of drawings and their effect in illustrating the author's thoughts (chapter four). From the first chapter to the last, the work is approached from far to near, starting with the broader edges of Francesco's written work and steadily penetrating into the fantastic world of his drawings.

The **first** chapter gives an overview of Francesco's life and work, offers the review of secondary literature, and forms a hypothesis about the particularity of Francesco's theory. The chapter focuses mainly on Francesco's ideas and intentions as an author. By looking at practices of medieval reading and illumination the chapter aims at framing Francesco's *Trattati* as a new form of theory, rooted in classical and medieval understanding and traditions, and yet embodying a new format and sense for the theory of architecture.

The **second** chapter renders the landscape of architectural theory during the Quattrocento from the standpoint of drawing and locates Francesco in his time and place. In a broader context, Francesco's work is situated in the lineage of the medieval formats of books that carried through the Renaissance, varying from sketchbooks, to pattern books, model books, note books and ultimately resulting in Francesco's own book: one of theory with drawings. The chapter refers to those of Francesco's written words and drawings that call specifically upon the notion of *disegno*, placing them in the immediate context of the Quattrocento by comparing them with the two other major treatises of the century, Alberti's *De Re Aedificatoria* and Filarete's *Dell'Architettura.*

The **third** chapter focuses first on expanding on and pointing to the elements that lead to the making of *disegno*. These elements, *ingegno, inventio* and *fantasia* are considered in the context of *Trattati*. A discussion establishes what constitutes the criteria of judgment, *giudizio,* which is much affected by Francesco' s notion of our intellect and our senses, specifically sight, as the primary sense that governs our understanding of the world. The second part of the chapter focuses on following how one of Francesco's sketches matured from his sketchbook to his *Trattati*, speculating on how elements of sense, memory and *fantasia* come together in his drawings and make them at once powerful tools of *disegno* and communication.

The **fourth** chapter divides Francesco's drawings into categories based on content. As an alternative to dividing the drawings according to their type, chronology, or authenticity, this chapter attempts to understand the drawings of *Trattati* through overlapping intentions, reinforcing the main premise of this study. In tandem with organizing drawings by content (intention), there is also an emphasis on their form, both of them inseparable in the *Trattati*. By coming full cycle, in analyzing content and form, the chapter offers a distinctive image of Francesco's achievements in drawing, and elaborates on his drawings' unique qualities. Then Francesco's theory of human analogy is studied through the hypothesis that the anthropomorphic drawings of *Trattati* become the point of convergence between theory and practice. By looking closely at a number of drawings and texts pertaining to this subject, the observation is made that in most cases theory is mainly expressed by drawings, and the text compliments the powerful associations that the images bring about. As Francesco's cast of characters animate and embody architectural thought and space through the pages of *Trattati*, to the point of an often oversaturated insistence sometimes bordering on the literal, the examination proves rewarding about the role of drawing and its potential.

The **postscript** makes an analogy between Francesco's time — a highly complex and stimulating period during which architects struggled with the phenomenon of *perspectiva artificialis*, and were preoccupied with setting standards and raising the status of architecture to one of the liberal arts — and our current dilemmas created by the propagation of digital media. As the development of *perspectiva artificialis* and the advancement of architectural drawings on the whole eventually contributed much to the art of architecture, hope exists that understanding anew the potentials, drawbacks, and limitations of architectural drawings may help us reclaim our priorities and reshape our expectations concerning the use of digital media.

Every chapter terminates with a drawing selected from Francesco's work, and a brief commentary that offers a re-reading of the selected drawing in relation to the themes of each chapter. As these re-readings are more interpretive and are written as a way to recapture the essence of the discussion by referencing the drawing, they appear at the edge of each chapter to be read as interpretations independant from the main body of work.

CHAPTER ONE
WRITING THE PROJECT OF ARCHITECTURE

"There are four ways of making a book. There are some who write down the words of others, without adding or changing a thing, and he who does so is a scribe, (*scriptor*). There are those who write down other's words and add something, however not their own additions. One who does that is a compiler (*compilator*). Then there are those who write down both others' and their own things, but materials of others predominate, and their own is added like an annex for clarification. Who does this is a commentator (*commentator*), rather than an author. But he who writes both what comes from himself and the others, with the material of others annexed for the purpose of confirming his own, ought to be called author (*auctor*)."[1]

Bonaventure

WRITING THE PROJECT OF ARCHITECTURE

OVERTURE

In an autobiographical tale, The Vision, Lucian (ca. 125 AD- ca. 180 AD)[2] recounts the story of his early adolescent years and the incident that determined his fate. Upon finishing school, his father gathers a council in order to determine which profession would best suit his son. The members of the council agree that a life of culture would be challenging for a family of limited resources, and therefore they guide him toward a life of handicraft work. Eventually, they select Lucian's uncle, a sculptor, to take him as apprentice as the young child had previously demonstrated some talent in making wax figures. Due to a first-timer mishap, Lucian falls into an argument with his uncle, gets beaten, runs back home and falls asleep in tears. In a life-altering dream, he finds himself divided between two women, each holding on to one of his hands and pulling him in her direction. One woman appears as a "working woman, masculine looking, with untidy hair, horny hands, and dress

1 Bonaventure, "Proemium" in Commentarum in Libris Sententarium, Opera Omnia (Claras Aquas 1882-1902), I, 14-15. I first came across Bonaventure's passage in Illich's work. Illich argues that Bonaventure's identification of the author presents the modern concept of the author as authentic. Cf. Ivan Illich, In the Vineyard of Text, a Commentary to Hugh's *Didascalicon* (Chicago: The University of Chicago Press, 1996), 106, 106 (35).

2 Lucian, The Works of Lucian of Samosata, Tr. by H. W. Fowler and F. G. Fowler, (Oxford: The Clarendon Press, 1905), "The Vision", 1 – 7.

kilted up … all powdered with plaster…"[3] reminding Lucian of his sculptor uncle. The other woman, on the contrary, possesses "a beautiful face, a comely figure, and neat attire."[4] As they fight over the young Lucian, neither succeeds in physically pulling him toward herself. They ask him to listen to their pleas and choose for himself. They aim at winning him over by describing the future that awaits him.

The woman in untidy clothes and rough appearance is Statuary (*Statua*). Speaking in a "strange jargon, stringing her arguments in a very earnest manner,"[5] she pleads with Lucian to join her and remain faithful to his maternal family's profession. Promising him a steady life, fame, and the notice of his fellow citizens, she specifically emphasizes the value of being rewarded for one's works over words. She confirms that if Lucian chooses her he will never experience spite and has no need to leave his country and people under any circumstances. She names Phidias, Polyclitus, Myron, and Praxiteles, all members of her entourage, all admired for their art. Then the well dressed, beautiful, eloquent Culture (*Cultura*) attempts to persuade Lucian to join her. She first reminds him that being a sculptor will bring him a life of manual labour. Instead, she claims that many rewards and privileges will be granted to Lucian if he chooses her over Statuary. Culture reminds him that influence, distinction from the masses, and a higher rank than the common craftsmen are attributes of her company. She enumerates the benefits of such an alliance in understanding ancient wisdom, the love of beauty, the yearning for all things great, and in attaining all human and divine knowledge. She boasts about her dependents by naming Demosthenes, Aeschines, and Socrates.

Cultura warns Lucian that in joining Statua, "you will be bowed over your work, with eyes and thoughts bent earthwards, abject as abject can be, with never a free and manly upward look or aspiration; all your care will be to proportion and fairly drape your works; to proportioning and adorning yourself you will give little heed enough, making yourself of less account than your marble."[6] Determined to avoid living such an interminable life and seduced by the charms of Culture, Lucian eagerly joins her and abandons the "clumsy mechanical woman."[7] To reward him for his excellent choice and right mind, *Cultura* then takes Lucian for a ride in her chariot to show him his future life, his admirers, his fame, and his status. Lucian concludes that all the hardships and difficulties he encountered in the course of pursuing Culture are indeed worth the rewards for

3 Ibid., 3.
4 Ibid.
5 Ibid.
6 Ibid., 5.
7 Ibid., 5-6. Lucian concludes by reminding the readers of his intent in telling the story: "I had an object in telling you my dream. It is that the young may be guided to the better way and set themselves to Culture…"

making the right decision. The Vision, written in the second century to articulate a distinction between *Cultura* and *Statua*, can also be understood as contrasting intellectual activity to manual work.

Over 1300 years later, the dream that determined Lucian's destiny took a much more complex turn in Italy, in the case of another man of modest upbringing and artistic inclinations. Francesco di Giorgio Martini (1439-1501), a Sienese artist, architect, sculptor and engineer lived an eventful life and produced work in each of the aforementioned domains. Moving between the poles of culture and craftsmanship with ease, Francesco operated as a craftsman as well as an artist and architect; he never lost the company of Cultura. He steadily sculpted himself into a theorist of architecture, a writer.

In *Architectural Representation and the Perspective Hinge*, Alberto Pérez-Gómez and Louise Pelletier remind us that the architectural drawings of the Renaissance should not be understood as "neutral artifacts that might be transcribed unambiguously into building"[8]. They state that the process of transfer from the abstract idea to built work is less systematic than what is often perceived in our contemporary understanding. By reminding us that, on the one hand, the practice of building was rooted in the medieval tradition; and on the other hand, architecture was understood as liberal art, they draw our attention to the complexity of the context of the early Renaissance.

Investigating the work of Francesco reveals such complexity by manifesting the different potentials/capacities of architecture at work. Even at the scale of the individual, Francesco's work and life appear as a challenge that defies categorical identification. The fact that the borders between the domain of the craftsman and the world of the artist are blurred only adds to the difficulty of negotiating a ground for Francesco as a writer. In the paragraphs that follow, Francesco's course of life and specifically the body of his written and drawn oeuvre are reviewed. My aim is to make a case for Francesco as an author who deliberately selected a certain process of writing - one that involves drawing. To be able to see his efforts in that light and look at his books from this vantage point, the present chapter aims to examine Francesco's life and work in light of his infatuation with the theory of architecture.

8 Alberto Pérez-Gómez and Louise Pelletier, Architectural Representation and the Perspective Hinge (Cambridge, MA: The MIT press 1997), 8-9.

In order to review Francesco's life, we begin with a brief biography based on a selected translation of Flavia Cantatore.[9] Then a few of the secondary sources, which suggest specific traits of Francesco's character and practice, are examined to gain a better understanding of the facts at hand.

Francesco di Giorgio was born to a modest family in Siena on September 23rd of 1439. According to Cantatore, Francesco's father, Giorgio, abandoned his paternal tradition of being in service of the *Comune di Siena* to become a property owner in Siena and the surrounding area. Francesco might have known Mariano Jacopo, il Taccola, through his father. Taccola was an engineer of sorts and was commonly referred to as the Archimedes of Siena. Francesco's interest in machines, mechanics and waterworks is either directly or indirectly related to him. Gustina Scaglia mentions that Francesco was in possession of Taccola's books and copied some of his machines into his own books[10]. Francesco's first official training began with his role as a painter in the *bottega* of Bartolomeo Alefi di Montalcino. Francesco might have traveled to Rome some time between 1460 and 1470; during this time he might have also come in contact with yet another Sienese Master, Lorenzo il Pietro, known as il Vecchietta. Cantatore states that from around 1469 to 1475, Francesco had a joint partnership with another Sienese painter, his brother-in-law Neroccio di Bartolomeo de' Landi. Their partnership was dissolved in 1475. A possible date for the start of a project by Francesco for the church of San Bernardino dell' Osservanza in Siena is 1476. The life-changing date in Francesco's life was some time in May 1477, when he met with the Duke of Urbino, Federico da Montefeltro, and Federico's childhood friend and advisor, Ottaviano Ubaldini. The dedication of the *Opusculum di architectura* to the Duke of Urbino was the precursor of extensive future collaborations including the Palazzo Ducale in Gubbio, the Palazzo Ducale in Urbino, and the fortifications of Sassocorvaro. In November of the same year Francesco moved to Urbino, now officially in the service of the Duke. He started to work on the Ducal Palace, picking up where Luciano Laurana had left off. Corrado Maltese suggests some time between 1479 and 1486 as the date of the early iteration of the two surviving copies of The *Trattati di architettura, ingegneria e arte militare*. A later addition of the drawings of antiquity was made by 1486. Maltese offers the period between 1485 and 1492 as the time during which Francesco revised his earlier treatise and wrote a manuscript – now lost – that

9 Among the other sources, Flavia Cantatore's "Biografia Cronologica di Francesco di Giorgio" offers a more recent account of the established facts of his life, in Francesco di Giorgio Architetto, A cura di Francesco Paolo Fiore, Manfredo Tafuri, (Milan: Electa, 1993), 412-413. I have translated and paraphrased some elements of this chronological biography.

10 Gustina Scaglia, Francesco di Giorgio, Checklist and History of Manuscripts and Drawings in Autographs and Copies from ca.1470 to 16887 and Renewed Copies, (1764-1839) (Bethlehem: Lehigh University Press, London: Associated University Presses, 1992), 15.

became the source for the two later copies of the *Trattati*. Between the years 1469 and 1492 Francesco was in charge of the works in the *bottini* – the underground Sienese aqueducts system – that provided water for all the fountains in the city. Around 1484 Francesco was paid for the design of the Church Santa Maria delle Grazie in Calcinaio. In 1485 he was elected as *supremo magistrate* by the *Comune di Siena* and in 1489 he made the two bronze angels which are located in the altar of the Duomo in Siena. Although he had made sculptures earlier in his life, the angels are quite exceptional – considering that he had dedicated most of his time to architecture and fortifications. In 1490 Francesco was summoned to Milan upon the insistence of Galeazzo Maria Sforza for the preparation of the Milan Duomo's *tiburio* (lantern). We know that he was also in Pavia with Leonardo da Vinci, to give advice on the dome under construction. In 1495 Francesco returned to Milan to do more fortification works and by 1500, he was called to inspect the cupola in Loreto and was commissioned to work on the fortifications in the same city. His *Raccolta di Macchine e Fortificazioni* also dates from this time. Francesco died on November 29th, 1501.

In his account of the lives of the artists, Giorgio Vasari praises Francesco as an excellent sculptor and architect, first and foremost for the two sculpted angels made for the Altar of the Duomo of Siena.[11] He then states that Francesco's paintings never equaled his sculpture. Regarding architecture, Vasari identifies Francesco as the architect of the Ducal Palace in Urbino, and admires the palace's beauty, especially its "bizarre staircases."[12] He further names Francesco as an able military engineer, particularly for the Urbino frieze depicting war machines. Vasari's mention of Francesco's theoretical work only hints at the fortification drawings. Referring to Francesco's interest in the architecture of antiquity, he regrets that the time Francesco spent on those could have been used to make more sculptures; however, he admits that the study of ruins would still bring Francesco honour. He cites Pope Pius II - in addition to Federico da Montefeltro - as Francesco's patron and the palace in Pienza as one of Francesco's projects. Vasari expresses gratitude for Francesco and emphasizes that no other man since the time of Brunelleschi had done so much to advance the art of architecture.

Allan Stuart Weller's dissertation on Francesco di Giorgio is a detailed description of Francesco's oeuvre.[13] The text, one of the first critical monographs on Francesco's works, is divided

11 Giorgio Vasari, Lives of the Most Eminent Painters, Sculptures and Architects by Giorgio Vasari Trans. by Gaston du C. de Vere (London: Macmillan and co., 1912-1915).
12 Ibid., 129.
13 Allan Stuart Weller, Francesco di Giorgio, 1439-1501 Ph.D. diss. University of Chicago (Chicago: University of Chicago Press, 1943). Within each section, Weller includes paintings, sculpture, architecture, and drawings and verifies the attribution of each piece to Francesco, followed by a description of each work in question.

into three different sections: "Siena 1439-1475," "Urbino, 1475-1485," and "Siena, Milan, Naples and Siena 1485-1501." Regarding the characteristics of Francesco's figural work, Weller points to the differences between the Sienese and Florentine schools of draftsmanship. He identifies the Florentine school with a "ceaseless search for plastic form and space relationship,"[14] an ongoing investigation since the time of Giotto, and opposes it to the Sienese school which had a "willful linearity"[15] leading to inconsistencies. He goes on to state that the Florentine school is much more advanced in the understanding and development of perspective than the Sienese.[16]

In comparing Francesco's ability in sculpture and drawing during the second period, Weller claims that his handling of the plastic medium is much stronger than his drawings. He qualifies Francesco's sketches as unsure and unconfident, with "poor proportions, illogical details and a curious timidity in execution."[17] Overall, Weller characterizes this late period - one in which Francesco's sculptural achievements have already become paramount in his production and in which he willingly expresses demanding and dramatic ideals - as a period that does not conform to standard Sienese qualities. In describing drawings in the *Taccunio Di Viaggio*, Weller considers them as preparatory work for the composition of the *Trattati*. This argument is further developed by Ericsson and will be discussed later.

Under "Francesco's reputation", Weller refers to passages from a poem by Giovanni Santi (Raphael's father);[18] wherein Francesco is considered a great architect who restored ancient ruins, built 130 fortresses and designed, yet did not succeed in building (due to the death of his patron) a magnificent church and sepulchral chapel. As a sculptor he is named as the creator of histories in bronze sculptures, as a speedy and lofty painter and an inventor of instruments, perhaps referring to his military activities. Santi's poem is of interest to us as it specifically points to Francesco's role in "restoring ancient ruins". Whether this is a literary device or a specific reference, the emphasis of

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Weller's descriptive account of Francesco's paintings, cassoni, sculptures, and architectural works is also accompanied by biographical investigations.

14 Ibid., 117.

15 Ibid.

16 This is a recurrent theme in many other sources of scholarship that compare the two schools. Similarly, Frommel refers to certain backwardness in Siena with regard to perspective. Christoph Luitpold Frommel, "Reflections on the Early Architectural Drawings" in The Renaissance from Brunelleschi to Michelangelo: the Representation of Architecture Edited by Henry A. Millon and Vittorio Magnago Lampugnani (New York: Rizzoli, 1994), 101-122.

17 Weller, Di Giorgio, 178.

18 The codex is No. 1305 of the *Ottoboniana* manuscripts in the Vatican. The poem was written after Federico da Montefeltro's death and dedicated to his son Guidobaldo, ca. 1490. According to Weller, the most interesting part of the poem is when the Duke of Urbino visits Federico I, Marquis of Mantua, coinciding with Santi's account of the principal contemporary artists from Gentile da Fabriano to Leonardo da Vinci.

Francesco's involvement in drawing ruins calls for further inquiry and will be discussed at length in chapter four.

Francesco made a number of *cassone* (wedding chest) paintings. These *cassoni*, which were made for noble families' weddings, traditionally depicted scenes of love. As such, themes like purity, chastity, and even those related to erotic love were to accompany a bride to her new home. According to Luke Syson, the production of cassone paintings was frequent in Siena during the 1470s and early 1480s, and Francesco was the most sought after artist among the Sienese artists who made *cassone*.[19] Benjamin David points to the Triumph of Chastity, one of Francesco's early *cassoni* which is based on Petrarch's *Trionfi.* [20] Discussing the complexities of Petrarch's references to a classical text, David qualifies the relationship between the image and text as a "tissue of quotations."[21] David explains that while Francesco referred to Petrarch's narrative as the main source, he took the liberty of adding other classical motifs. As classical elements these would seemingly reinforce the narrative - similar to the way that round temples were a recurring motif in some of his paintings. David speculates that the *cassone* narratives emanated from "eclectic and adaptable representational practice,"[22] including elements of Francesco's drawings of ancient ruins. He claims that the occurrence of similar elements in both Francesco and Neroccio's *cassoni* proves that they used illuminations, pattern-books, and prints.

In hypothesizing that Francesco and Neroccio might have used pattern-books, David also points out that their *cassone* painting motifs, in turn, became sources from which other people copied. He points to both tension and influence between Francesco and Neroccio as collaborators, but also to the presence of Liberale da Verona and Girolamo da Cremona in Siena and their influence on Francesco's work. David calls for understanding the *cassone* paintings not with a conventional focus on a single author, but on the contrary, in a way that recognizes their complex weaving of multiple narratives, voices and styles. For us the interesting point of David's argument is his recognition of the complexity of Francesco's work and its woven texture.

19 Luke Syson et al., Renaissance Siena Art for a City (London: National Gallery Company, 2007), 213- 219.
20 Benjamin David, "Narrative in Context, The Cassoni of Francesco di Giorgio" in Renaissance in Siena Art in Context, edited by Lawrence Jenkens, Sixteenth Century Essays and Studies, Vol. 71. (Kirksville, MO: Truman State University Press, 2005), 109-137.
21 Ibid., 112.
22 Ibid., 120.

Scaglia[23] defines the engineering facet of Francesco's carrier as the start of his collaboration with *bottini*, in which his mandate was defined to provide more water for the fountains in Siena. She also hints at the complexities of the diplomatic operations; Francesco as a citizen of Siena was constantly called to inspect existing structures or to recommend improvements to new projects. This made him some enemies. Scaglia refers to a letter – written to the Sienese government from Urbino – in which Francesco expresses his disappointment at accusations upon his integrity toward his hometown and reaffirms his patriotism and faithfulness towards his native city. Apart from his long association with Federico da Montefeltro, the Duke of Urbino, and later his son Guidobaldo, Francesco did some work for Alfornso, Duke of Calabria. Evidence of calls by Virginio Orsini, in 1490 and Ludovico Sforza in 1491 proves that Francesco's fame in the field of military and engineering expertise had spread throughout Italy. Regarding the connections between Francesco and the Duke of Urbino, Scaglia points to the fact that Francesco had previously illuminated a manuscript of Albertus Magnus, *de Animalibus*, for Maestro Alessandro Sermonata, who taught at the Studio in Siena (also known as the *Domus Sapientiae*). During the visit of the Duke of Urbino and the Duke of Calabria to Siena in 1478, the Duke of Urbino stayed in Sermonata's house, and might have met Francesco at that time.

In *Bearers of Meaning*, John Onians dedicates a chapter to Francesco as one of the major theorists of the Quattrocento alongside Alberti and Filarete.[24] Onians distinguishes two characteristics of Francesco's life that set him apart from his predecessors: a much deeper involvement with the architectural profession; and his Sienese background, distancing him from Florence and its affiliations. With regards to Francesco's education, Onians refers to his humble background and qualifies his progressive improvement as the "efforts of a man self-taught in his mature years"[25]. Onians argues that Francesco belonged to the first generation of artists and architects that benefited from printed press extensively in their education. Onians specifically refers to three major published works which influenced Francesco's work: Valturius' *De Re Militari* published in Verona in 1472, Alberti's *De Re Aedificatoria* in 1485, and Vitruvius's *De Architectura* in 1486. Onians' argument is valid: most of the transformation of Francesco's thought over the years was not a result of having real mentors as much as it was due to his thirst for learning and understanding philosophical and architectural works with which he had affinity, such as Aristotle's and Vitruvius' works.

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23 Scaglia, Checklist, 13.
24 John Onians, Bearers of Meaning, The Classical Orders in Antiquity, the Middle Ages, and the Renaissance (Princeton, New Jersey: Princeton University Press, 1988). In Onions' book about orders a chapter is dedicated to Francesco entitled: "Francesco di Giorgio Martini". 171-181.
25 Onians, Bearers, 172.

In a special feature of *Domus* magazine dedicated to Francesco, Carlo Palazzolo[26] comments on his profession. By referring to Galeazzo Maria Sforza's invitation to Francesco for the examination of the Milan cathedral's *tiburio* (lantern) in 1490, Palazzolo maintains that Francesco, at the height of his fame, was "the most esteemed and sought-after builder" of his time.[27] In enumerating the obstacles of identification and attribution, aside from the typical dilemma of repeated demolition and construction through time, Palazzolo points to the common predicament of Renaissance architectural practice – as in many cases the architect would visit the site and give instruction to the workmen, often accompanied by a wooden model, and the rest of the work would be carried forward by master masons. Regarding Francesco's built projects, Palazzolo claims that these are not direct transfers of his ideas as presented in the *Trattati*, but rather, the outcome of a "method that adapted the principles to the specific conditions." He claims that Francesco's Sienese origin and his interest in Roman architecture had a great influence on his work. He also refers to Francesco's knowledge of bronze casting – necessary for different casting purposes, from medals to cannons – that along with other elements of expertise nourished his architectural projects. Hydraulic knowledge and military engineering, yet other components of his professional life, allowed him to understand and therefore resolve particular site conditions and challenges. Palazzolo concludes by stating that ultimately Francesco's fusion of all these skills was always subordinated to his painterly interests in "creating subtle visual equilibrium" which "optically" harmonized the distortions and adaptations that had to be applied to the models in the treatises in order to realize them.

THE WRITER'S OEUVRE

The brief selection of the above-mentioned biographical accounts and anecdotes, though fragmented and divergent, prove one important point: Francesco's range of works is diverse enough that one could associate him with painting and sculpture on the one hand, and with military architecture and engineering projects on the other. As the focus of this chapter is on Francesco as an author, a theorist of architecture, an overview of his theoretical work is in order. To do so, a list of Francesco's work will follow.[28]

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26 Carlo Palazzolo, "Francesco di Giorgio Martini Architetto di Siena", Domus, No. 750, (June 1993), Itinerario N 91, As part of the events generated by the publication of Francesco di Giorgio Architetto, that special edition of Domus magazine offers an addendum with a foreword by Carlo Palazzolo, as well as a project-related timeline by Luigi Spinelli that offers a well documented geographical and detailed map and definition of the architectural projects by and attributed to Francesco di Giorgio.

27 Ibid. First page of the addendum. (The addendum does not have page numbers.)

28 For the most extensive listing of Francesco's oeuvre, Scaglia's work offers the most recent and extensive details pertaining to different works. Scaglia, Checklist, 25-39.

Two subtle distinctions are to be made. First, all of Francesco's works remained in manuscript format during his life and later on, yet in this study they are referred to as books[29]. This seemingly problematic appellation responds to the fact that most of his oeuvre had a format and a presupposed audience that suggested a clear interest in establishing a dialogue. In other words, these are not private notebooks, but books addressed to an audience. Second, the drawings of the following works are identified as Francesco's drawings; however some of the works are original manuscripts - such as the *Codicetto* and the *Opusculum* – and some are copies done by scribes or copyists. In particular, the important *Trattati* drawings are done by intermediary hands. As the purpose of this dissertation is not to establish authorship, all the drawings are understood to represent Francesco's intentions and originate from his own hand. Here, then, the genealogy is not established as a matter of direct provenance, but as a matter of intellectual authorship.

The list and brief description of Francesco's oeuvre correspond to Scaglia's Table of Autographs and Affiliated Copies[30], which offers the most detailed and accurate study of the manuscripts and their histories.

- *Opusculum de architectura*: (Autograph, ca. 1470-75) [31] This book contains drawings of machines and a few plans of fortresses and military apparatus as well; it is considered a partial copy of some of Mariano Taccola's machines[32]. The *Opusculum* is a compendium of machine drawings, one of the categories in which Francesco invested his talent and became well known. One should consider that the *Opusculum* is likely to have been Francesco's first book of drawings. Its importance is paramount, for it shows the young artist in a process of study and examination that includes absorption of other people's work and his own thoughts equally.

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29 See chapter two, 47-51, for the variations on the different types of books, such as sketchbook etc. will be discussed.

30 Scaglia, Checklist, 27.

31 Francesco di Giorgio Martini, Opusculum di Architectura, Codex 197 b 21, London, British Museum from Urbino. Most of the drawings are executed with a great deal of care, traces of erasing or re-drawing are rarely manifest. The only text that accompanies the drawings is a brief dedication by Francesco di Giorgio to the Duke of Urbino.

32 Mariano Taccola (1382 – c. 1453), the Archimedes of Siena, was an engineer and expert in water works. His books contain drawings of machines, and carry drawings of his own works, and recording of others'. He is known to have drawn some of Brunelleschi's machines out of memory or based on other witnesses' description. For references on Taccola see Mariano Taccola, Liber tertius de ingeneis ac edifitiis non usitatis, A cura di J. H. Beck, Testi e Documenti 1 (Milano: il Polifilo, 1969). Also see Mariano Taccola, De Machinis, Ed. Gustina Scaglia, (Weisbaden: Reichert, 1971) and Mariano Taccola, De ingeneis, Liber primus leonis, Liber secundus draconis, et addenda, Ed. Gustina Scaglia, Frank D. Parger and Ulrich Montag, (Weisbaden: L. Reichert Verlag, 1984); and Frank D. Parger and Gustina Scaglia, Mariano Taccola and his book "De Ingeneis" (Cambridge, MA: MIT Press, 1972).

- Il Codicetto: (Autograph, ca. 1470-90) [33] This sketchbook, which is what Francesco most likely carried with hims in order to get work at Urbino, contains machines that are copied after Taccola's *de ingeneis* and plans of fortifications. Except for one little drawing in this book, which will be discussed in chapter three, the content of this sketchbook is similar to that of the *Opusculum.* [34] However, the small format makes it a portable book that would have most probably accompanied the architect on many of his travels.[35]

- Uffizi Sketches, **also known as** ***Taccunio di Viaggio:*** (Autograph ca. 1470-1480) [36] These are detached sheets of sketches that Francesco made of ruins of classical architecture in Rome, Naples and the surroundings. Some of these sketches were then used in *Monumenti antichi* (see below); some were copied by other artists and architects.

- Selezioni da Vitruvio: (Copy ca. 1475-1480) [37] Scaglia names the fragments that Francesco translated from Vitruvius and included in his *Trattato I* as *Selezioni*, therefore this is not a manuscript per se, but fragments of Vitruvius's work that Francesco inserted in his *Trattato I*. In a publication entitled *Il "Vitruvio Magliabechiano" di Francesco di Giorgio Martini,* Scaglia searched and gathered fragments of Francesco's translations of Vitruvius from *Trattato I*, (See also *Traduzioni di Vitruvio)*

Trattato I: (Copy, ca. 1475-80) [38] is one of the two treatises that make up Francesco's major work of architecture theory, which found a finished form ca. 1475-80. *Trattato I* is the young architect's most ambitious undertaking. Francesco wrote what is known as *Trattato II* ca. 1490, in which he incorporated many of his ideas from *Trattato I*; however the two works differ significantly in language, form and content. Both the earlier and later originals are lost. Only copies made by scribes

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33 Francesco di Giorgio Martini, Il Codicetto Codex Urb. Lat. 1757, Vatican, from Castel Durante, Urbino. This sketchbook has been faithfully reproduced in format and size and published: Francesco di Giorgio Martini, Das Skizzenbuch des Francesco di Giorgio Martini (Zurich: Belser Verlag, 1989).

34 The sketch in question is discussed in chapter three.

35 Although the book has a very small format, in comparison to Francesco's other books, the drawings have great details, and the small size has not compromised the drawings' quality.

36 Francesco di Giorgio Martini, Taccunio di Viaggio Uffizi, Gabinetto dei Disegni e Stampe, Florence.

37 Il Vitruvio Magliabechiano di Francesco di Giorgio Martini, A cura di Gustina Scaglia, Documenti inediti di cultura Toscana, Volume VI, (Florence: Edizioni Gonnelli, 1985). As these are extracted from T1, refer to T1 in the footnote 38.

38 As Francesco's authentic work has been lost, the two remaining copies, commonly referred to as Codex Ashburnham 361 and Codex 148, are cited based on Maltese's edition in the subsequent text. The Ashburnham 36 Number 1 is a copy by scribes done at Monte Oliveto Maggiore in Siena; drawings in this codex are attributed to an anonymous copyists and a follower of Neroccio di Landi, Biblioteca Medicea- Laurenziana, Florence. Codex 148 Saluzzo is also done by a scribe at Monte Oliveto Maggiore; the drawings are by an anonymous disciple of Neroccio and another anonymous copyist. Biblioteca Reale, Turin. Cf. Scaglia, Checklist, 154, 189.

and artists survive. The two earlier copies are known as *Trattato I*, and the two later ones as *Trattato II*. Two copies of *Trattato I* were made by the monks of Monte Oliveto Maggiore and Sienese artists:

-Codex 148 Saluzzo, Turin

-Codex Ashburnham 361 (This version is annotated by Leonardo Da Vinci, when he was at the scriptorium in 1503.)

Trattato I and *Trattato II* were published in a compendium edited by Corrado Maltese under the title of ***Trattati di architettura, ingegneria e arte militare*** in 1967, which is referred to here as the *Trattati*.[39]

- Traduzione di Vitruvio: (Autogrph, ca. 1485) [40] Part of the Magliabecchianus I. II.141 Codex, this series contains Francesco's tranlsation of Vitruvius. This iteration follows an earlier attempt, referred to by Scaglia as ***Selezioni di Vitruvio***, containing the fragments of Vitruvius' text inserted in his *Trattato I*.

- ***Opera di Architectura:*** (Copy, Ca. 1484)[41] It consists of illustrated text copied by a scribe from a lost original, commonly referred to as the Spencer Codex. This copy is identified with Francesco's name as author and his Patron Alfonso, Duke of Calabria.

- ***Monumenti Antichi:*** (Copy, Ca. 1490)[42] This series consists of drawings copied by an anonymous Sienese artist, of which two are annotated by Francesco. Many structures are finished copies of Francesco's sketches. (See *Taccunio*) These drawings make for an additional chapter in *Trattato* I.

- ***Trattato II:*** (Copy, ca. 1490) [43] This represents Francesco's major work of architecture theory in its mature iteration. It was most probably copied from a lost original by scribes in Siena.

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39 Francesco di Giorgio Martini, Trattati di Architettura Ingegneria e Arte Militare, A cura di Corrado Maltese, trascrizione di Livia Maltese Degrassi, (Milan: Il Polifilo, 1967). The two volumes represent the earlier and later version of Francesco's treatises.

40 Part of the Codex Magliabechiana II 1 141, Biblioteca Nazionale, Florence.

41 Codex Spencer 129, New York Public Library, Spencer Collection, New York City; the text is attributed to a scribe at Monte Oliveto Maggiore and drawings are done by an anonymous copyist. Cf. Scaglia, Checklist, 210-211.

42 Codex 148 Saluzzo, Biblioteca Reale, Turin.

43 There is an earlier version of T2, done by anonymous scribes and copyists in Domus Sapientia of Siena, Codex IV 4, Biblioteca Comunale, Siena. The later version of T2 is in Codex Magliabechiana II 1 141, Biblioteca Nazionale , Florence. The work is copied by anonymous scribes and drawings are attributed to Giacomo Pacchiarotti. Cf. Scaglia, Checklist, 221 and 251.

- Codex S IV 4, Siena (ca. 1490) Francesco's text on architecture and forts was copied by scribes probably at the Studio of Siena; the editor instructed the scribes in Hebrew in this first version:

- Codex Magli. II I 141, part 1, Florence (ca. late 1490) Second version by editors and scribes at the Monte Oliveto Maggiore: it is revised over the first Trattato II.

- Raccolta di Città e machine: (Copy circa 1490s)[44] The series is in Codex Magl. II I 141, part 3, and is a copy book of drawings, with no text, by the so-called 'Raccolta Artist' of Siena. Some machines and fort plans adopted from *Trattato I*; most forms are entirely new with no basis in *Trattato I* or *Trattato II*.

- ***MS 09.2690: Codex Zichy:*** (Adaptation of Francesco's text and copies of his drawings ca. 1490s.)[45] Known as Codex Zichy, it includes Francesco's *Trattato I* text, rewritten, and its drawings copied with other drawings added to this manuscript by Angelo dal Cortivo in Venice.

Album Codex coll. E. e. I 28, Firenze: (Adaptation of Francesco's text and drawings ca 1500-20)[46] The copybook-treatise is written and illustrated by Lorenzo Donati in Siena, borrowing his fort designs from Francesco's *Trattato I*, Vitruvian texts from his *Traduzione di Vitruvio*, partial wording of Francesco's preface for the *Monumenti Antichi*, forts from *Trattato II*, and forts from *Raccolta*.

Referring to the large corpus of Francesco's manuscripts, Alina Payne[47] suggests that his works expose future architects, specifically his contemporaries, to "a complex thinking process"[48]. By pointing to the multiplicity, overlap and self-referential nature of Francesco's manuscripts, Payne calls his oeuvre one of a "vexed chronology" [49] and points to its "accretive and self-editing character"[50]. On the other hand, Scaglia identifies Francesco as an "author of illustrated text"[51], while

44 Part of Codex Magliabechiano II 1 141, part 3, Biblioteca Nazionale, Florence. Scaglia does not recognize it as authentic, and claims it is done by the Raccolta Artist. Cf. Scaglia, Checklist, 267.
45 Commonly known as Codex Zichy, this is an adaptation in parts by Angelo da Cortivano. Szabo Ervin Municipal Library, Budapest. Cf. Scaglia, Checklist, 274-276.
46 Album Codex Coll. E. 2. I. 28 (Accademia Mauscript), Biblioteca dell'Academia di Belle Arti, Florence.
47 Alina Alexandra Payne, The Architectural Treatises in the Italian Renaissance Architectural invention, Ornament, and Literary Culture (Cambridge: Cambridge University Press, 1999). Payne has dedicated a chapter to Francesco entitled: "Francesco di Giorgio, Visual and textual patterns". Her book is a vertical study of the question of ornament during the Renaissance, and covers the theoretical works of Alberti, Francesco di Giorgio, Serlio, Spini, Palladio and Scamozzi. Payne argues Francesco had a more 'visual' treatment of theory, in contrast to Alberti's more 'tectonic' work, 89-112.
48 Ibid., 89.
49 Ibid.
50 Ibid.

examining his work in relation to the study of Vitruvius. I propose that the connecting thread in relating all these works are Francesco's drawings, which are not images, but rather remnants of Francesco's thoughts and imagination: evolving, and ultimately outliving the architect.

As a possible first step, one might distinguish the purpose, format, and content of Francesco's various works. Alternatively, one might decide to understand them as parts of a whole. In this manner Francesco's body of work can be understood as manifestations of the architect's thoughts during different phases of his life. What stands out as a remarkable characteristic linking all these works, from the earliest phase to the latest period, is the continuous flow of drawings associated with the texts. Autograph and copied texts and drawings developed in the 1470s to 1490s as a certain part of Francesco's activities are significant as they indicate a constant preoccupation with carrying on the project of writing and drawing on architectural matters. Aside from the multiplicity of the works created, the variety of inquiries and forms of thought designates the boundaries of Francesco's investigation and manifests an elaborate structure of the work in its totality.

Based on a suggestion by Scaglia that argues for recognition of Francesco's earlier work as preparatory, I would like to extend the argument and propose a division of his theoretical work. I believe Francesco's theoretical texts are divisible into three different segments: foundation, body, and extensions. In the foundation group, I would place the earlier work, the depiction of the machines, the translation of Vitruvius and the recording of ancient ruins. The body of his work is comprised of the two versions of The *Trattati*, as they represent Francesco's ideas in a structured format. The extensions include other copies, partial or whole, which assemble either the collection of machines, ruins, translations of Vitruvius or sections of the *Trattati*.

Foundation

For what concerns the foundation of Francesco's work, three main themes emerge as significant: the machine drawings, the drawings of Antiquity, and the translation of Vitruvius. Concerning the machines, Scaglia [52] offers background, attributing their origins in the early Quattrocento in Italy and Germany. She states that the machines would be understood as "illustrated" by the drawings, rather than the drawings being a precursor for the actual building of the

51 Scaglia, Vitruvio, 16- 25. Scaglia has selected this title or one of the chapters in her book, indicating the importance of drawings in Francesco's work. However I believe these drawings are not just illustrations but drawings, in that they delve deeper in their intentionality to connect between the architect's mind and his ultimate objective. See chapter two, 55, for more elaboration on this theme.
52 Scaglia, Checklist, 9.

machines.[53] Scaglia considers Francesco's drawings as entirely imaginary because of the intricate combination of their different wheels, valves, pumps, and so on. Even though Francesco's drawings of machines are largely copies of Taccola's machines, Scaglia believes that they expand on the quantity of examples for each type. In addition, there is great creativity in Francesco's combinations of the different elements of the machines, together with an entirely new set of cars, obelisk haulers, and column lifts.

Scaglia states that Francesco's main aim in producing such drawings was to gain employment, as had been the case for Taccola. She further points to Federico da Montefeltro's interest in Francesco's paper inventions. Scaglia then gives an account of the further reception of Francesco's machines by the younger generation. By reminding us that architects like Antonio da Sangallo il Giovane called Francesco's drawings largely inoperable machines, Scaglia states that nevertheless artists and architects copied his machines extensively. She identifies the drawings not as blueprints or an intermediary medium, but as a final product, important in conveying the author's imaginative power.

While Scaglia is correct in giving value to the machines as they are seen rather than for depicting reality, I believe the power of the machine drawings cannot be underestimated as a way to record, remember and potentially to communicate to others. While the drawings of Brunelleschi might have been studies for his own understanding, I believe Francesco's drawings of machines would still make sense, not as blueprints, but as visual evidence for master masons or military crew to make sense of how the machines were to function. On the other hand, I interpret Scaglia's emphasis on the life of machines in drawings as yet another window that opens up on the potential role of drawings for Francesco's contemporaries. Other motives such as a fascination with motion-mechanisms aimed at mimicking organic life, or an understanding of motion as real change based on an Aristotelian philosophy, are among the possible motives behind Francesco's interest in machines.

With regards to the sketches of Antiquity, Christopher Ericsson's examination of a series of 20 sketches of Francesco at the Uffizi is interesting.[54] Ericsson believes that Francesco was not

53 Ibid.

54 Christoffer H. Ericsson, Roman Architecture Expressed in Sketches by Francesco di Giorgio Martini: Studies in Imperial Roman and Early Christian architecture (Helsinki: Societas Scientiarum Fennica, 1980). The sketches document Francesco's observations and comments, mainly on ancient monuments he visited, including some of his own projects. Ericsson has limited his study to those sketches pertaining to Antiquity or early Christianity. Together with these series, Ericsson also attempts to trace the relationship between these sketches and those he calls folio drawings that are added to the *Saluzzianus*. The main purpose of Ericsson's study is to find correspondence between Francesco's drawing and the actual ruin or

successful in re-creating the Vitruvian principles, but his work succeeded in being "freely composed of factors of interest studied, resulting in a stern Roman style and in volumes cut and hollowed from masses."[55] He notes Francesco's creative freedom, and maintains that in general the appropriation of ancient material during the Renaissance was not "an act of copying, but of creating anew, yet discovering and analyzing the formal canons of antiquity."[56] Further study of Francesco's intentions with regards to these series of drawings in chapter four confirms Ericsson's assessment.

Ericsson points to the mixed orders and styles in Francesco's drawings, stemming from the artist's lack of ability in distinguishing the different epochs – such as some anachronistic mistakes which associated later projects to earlier times. He claims that these sketches lack a general attention to detail, being executed with great freedom in depicting outlines as opposed to tectonic interrelationships. It seems that Francesco's method is less precise than sketches made for architectural or sculptural decoration. They lack accurate measurements, yet at the same time demonstrate Francesco's imagination in visualizing ancient architecture. Ericsson claims that the folios appended to *Saluzzianus* are the earliest collected depictions of architecture gathered to record the works of antiquity.[57] Pointing out the amount of freedom taken in their documentation, the absence of a scale beyond *piedi* (naturally undermining smaller proportions), the absence of heights in many cases, and Francesco's selection of certain details and neglect of others, Ericsson claims Francesco's drawings lack historical accuracy. At the same time, he notes an avid interest on Francesco's part for sculptural decoration or ornament, demonstrating a formal curiosity that disregards specific measurements.

Similar to his attitude toward machines, Francesco's studies of ruins are a combination of observation and imagination. Ericsson's point that Francesco may have copied the buildings by drawing them and then set to analyze them through drawing is significant. While Ericsson criticizes Francesco's drawings of ancient buildings for their lack of historical accuracy, I would argue that accuracy might not have been an issue. As will be demonstrated in the next chapter, it was customary for itinerant artists to travel in search of works that might serve them as models throughout the

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monument in question. Ericsson identifies Francesco's preference for non-classical principles and his interest in round polygonal structures as a gradual approach of Byzantine forms.

55 Ibid., 231.

56 Ibid. In this respect he was joined by younger artists and architects, such as Giovan Antinio Dosio, the Sangallo brothers, and the Sienese, Baldassare Perruzi. The perspective of city prospects by Perruzi closely resembles those by Francesco in which we meet the round façades of theatres and amphitheatres, superimposed arcades of archivolts, or the strict Vitruvian orders of pilasters observed in the coliseum or in the theatre of Marcellus. All these had been previously noted and formulated by Francesco.

57 It is known that others had compiled such images previously, but Ericsson may have a point that this was the earliest substantial body of drawn material that has survived.

Middle Ages and the Renaissance. Such behaviour appears to yield a more precise explanation of Francesco's interest in drawing ruins than the notion that they were mere records. I believe Francesco drew to understand: the act of drawing was a way to comprehend and eventually to remember the principles of Classical architecture.

On Francesco's attitude towards Vitruvius, Richard Betts' study of Francesco's *Trattati* is informative.[58] Pointing out the gradual change in Francesco's attitude towards ancient sources, Betts indicates that Francesco intentionally omits what does not serve his purpose. According to Betts' assessment, Francesco transformed his first chaotic treatise into a clear and coherent theory of architecture that could be used by a practicing architect. Betts observes that Francesco's primary instinct to borrow concepts from Vitruvius was later transformed into his lifelong effort to undertake a thorough education in what we would call the humanities. On Francesco's reliance upon Vitruvius, prominent in the first version and much reduced in the later version, Betts states that Francesco realized the shortcomings of ancient authority for what was essentially his own development of the theory of human analogy. Consequently he turned to sources other than Vitruvius, specifically to Aristotle, in order to formulate his ideas within a philosophical framework and keep his distance from the initial influence of Vitruvius.

In a passage that demonstrates his relation to Vitruvius,[59] Francesco describes his own work method. He emphasizes that he, for his own satisfaction, has examined several volumes and writings of the ancient author and has investigated in many different locations many ruins of ancient palaces and temples. Francesco states that among all authors, it is Vitruvius who has treated the matters of building the most abundantly and minutely. Here we are faced with a formulation of Francesco's process of work, which Scaglia identifies as an "avocational interest".[60]

Francesco's extended efforts in each of these domains eventually came together and paved the way for the *Trattati*. The translation of Vitruvius and an effort to relate his sayings to ancient

58 Richard Johnson Betts, "The Architectural Theories of Francesco di Giorgio" Ph.D. diss. Princeton University, 1971.

59 Scaglia, Vitruvio, 22 (21). "Pure per satisfare a me medesimo ho voluti ricierchare alcuni volumi e scriti degli antichi. Inde apreso, non senza fatiga, né con picola solecitudine ho cierchò investigando in diversi paesi e cità infinite ruine di mirabili edefiti di palazi e tempi, e le misure e proportioni d'esse. E sicondo queste simetrie di tempi e case, ho preso ogniuno fondamento de le quali le ragioni e misure loro spricherò. E perché la fama diei primi inventori, e di quelli che in tale parte anno descrita, per la longheze del tempo in tuto oscurata e spenta non sia, ò [de]terminato in parte suscitare. Sicome innanzi è dito, non t[r]uovo da Vitruvio in qua alcuna tale arte più copiosamente abbi tratato, per bene che molti sieno stati."

60 Scaglia, Vitruvio, 25. Scaglia identifies the search for books together with Francesco's study of Vitruvius and ruins as outside the range of professional activities of the architect and argues that they become the foundation upon which Francesco built his theoretical work.

ruins, as well as the copying of machine drawings, all seem to fit within what Bonaventure has qualified as the task of the compilator and that of the commentator. Scholars such as Betts, Scaglia, and Payne almost unanimously agree that Francesco gained a better understanding of Vitruvius as he advanced through life. This maturation process was partly influenced by the company of the Duke of Urbino and his courtiers on the one hand, and Francesco's access to the Duke's library on the other hand. Yet the impact of Francesco's own working methods – which I call "field work" – should not be underestimated. Francesco's attempts to collect and reproduce machine drawings, as well as his effort to incorporate Vitruvius' work, is well within the tasks of a compilator. By first understanding and establishing a rapport with these different bodies of work, he then slowly set to transform them, establishing a dialogue with the works and gradually acquiring the status of the commentator. This "field work" is what Francesco advanced in both text and drawing. His effort to absorb and translate Vitruvius's works and ultimately transform them is similar to his act of recording ruins and slowly modifying them. I believe the emergence of Francesco as a commentator is manifested in this early phase.

Body

The main body of Francesco's theoretical work is comprised of the two iterations of his *Trattati*, as they represent his ideas at their best. The second version, T2, is distinguished as a more mature text. It is more structured, it draws upon works of philosophy, and it follows a more systematic pattern of introduction, body, and conclusion. I maintain, however, that T1 is in no way less significant than T2. Many of the critical ideas are already present in the earlier work. One might argue that T2 shows evidence of more theoretical development than T1: hence the more abstract nature of the drawings, which can be understood as ideas of buildings rather than illustrations of them. Though this might have been an outcome of the copyists' styles, the drawings of T1 are more elaborate, numerous, and most particularly, more in the style of typical orthographic drawing. For example they demonstrate plans with wall thicknesses, which is not the case for the plans in T2.

In calling Francesco the Sienese counterpart of Leonardo da Vinci, Betts claims that Francesco accomplished more in the field of architecture than Leonardo since his interests were more focused.[61] For Betts, the *Trattati* is neither a source of information for the Renaissance, nor a reiteration of *De Re Aedificatoria* by Alberti. Rather, the work shows Francesco's intellectual journey as an architect, starting as a craftsman and ending as a humanist. While Bett's original assessment of the

61 As concerns the *Trattati*, Richard Betts' critical work is one of the main English sources to examine Francesco's theories in their entirety.

augmentation of Francesco's abilities and his constant improvement of his knowledge and writing is valuable, Francesco never aspired to be a humanist *per se*. His activities remained centered on the practices of art and architecture. Therefore his original intent and his works are different from someone like Alberti who was a humanist first and foremost. Betts claims that Francesco's *Trattati* starts a dichotomy between the art of architecture and the science of engineering.[62] Betts argues that Francesco realized that Vitruvius had failed, since the intellectual status of architecture could not be borrowed from other arts. Therefore Francesco reasoned that the art of drawing would be the source of architecture, as he believed drawing was a liberal art in ancient times. Betts maintains that Francesco's argument is bound to fail, because for Betts architecture and drawing are two different things. However, Betts does admit that Francesco succeeded in advancing the intellectual dimension of architecture through the drawings in his *Trattati*.

Following Scaglia's lead, Payne states that Francesco's manuscripts were well-known and well-circulated. She identifies Pietro Cataneo, Peruzzi, Leonardo da Vinci, Raphael, Diego de Sagredo, Dosio, Ignatio Danti, Barbaro, and Scamozzi[63] as artists who might have come in contact with Francesco himself or his work. Payne states that even though these architects might not have embraced all of Francesco's ideas, "at the very least, his images and words have entered and swelled the Vitruvian thesaurus."[64] The transmission of Francesco's work, which was done mainly through copying his drawings, distinctly indicates the importance of his work.

Payne declares Francesco's literary output as important as Alberti's, yet qualifies it as a visual or textual recuperation, rather than a finished book. In relation to their connection to Vitruvius, Payne identifies Francesco's work as the more significant of the two for incorporating a much more direct and extensive 'annexation of Vitruvius."[65] Payne rightly acknowledges that Francesco's deliberate work of assimilation of the Vitruvian text was not so much that of "the reclaiming project of the humanist, but of the architect who needed answers to specific questions and literally wanted to use Vitruvius."[66] She also foregrounds the specificity of Francesco's work "harnessing the visual

62 The emphasis on the terms of the "art" of architecture and the "science" of engineering is from Betts. I am not certain the distinction is really as pronounced as Betts emphasizes. I believe Francesco is still operating in a realm where these different activities do not dictate, as of yet, separated disciplines.
63 Payne, Architectural Treatises, 90.
64 Ibid.
65 Ibid.
66 Ibid. Although Payne's assessment is not wrong, one might argue the more open-ended exegesis might have been also an outcome of Francesco's style of working, because he undertook a similar process for the drawings from ruins.

domain to the textual one."[67] By arguing that ultimately the visual material, together with the open annexation of Vitruvian text and the remaining ruins, makes for a compendium: one weaved together so that "whichever manuscript reached his [Francesco's] readers, it would have displayed and promoted this blend of genres as an essential ingredient for making theory, just as it would have contained his own brand of Vitruvianism." [68] Payne believes that while Francesco's attempt at the assimilation of the Vitruvian text might have "its rhetorical motivations and may be inscribed in the contemporary effort to establish and display architecture as a liberal art, and the architect as a man of learning, it also constituted a literal model of how to theorize architecture."[69]

Regarding the *Trattati*, Scaglia takes the same route as previous authors by stating that while Francesco's train of thought and clear classification of subjects already existed in his *Opusculum* and in the first version of his *Trattati*, the later versions seem to have benefited from his exposure to the atmosphere of the Studio in Siena, the flourishing intellectual scene of Urbino's court, and his battlefield experiences. In T2 each chapter starts with a pertinent philosophical argument with reference to intellectual figures like Aristotle, Eupompo of Macedonia, and Pliny the Younger. Scaglia also hints at the double-sided nature of Francesco's position by the end of his life: on the one hand he was associated with the liberal arts and thus related to humanists; on the other hand, his artist-craftsman background pulled him towards the mechanical arts.

As previously mentioned,[70] John Onians confirms Maltese's original suggestion that the two codices of M and S, making up T2, were both in reaction to the first printed texts of Alberti in 1485 and Vitruvius in 1486. With regards to the differences between T1 and T2, Onians distinguishes an increase in both the coherence of the written material and the amount of text dedicated to architectural topics. He argues that T1 contains many disconnected sections with subjects that vary from architectural elements to machine components. He reads a clear order in T2, composed in seven segments, identifying a much more structured and mature manifestation of Francesco's thought. Onians confirms that in tandem with the textual content the drawings, while larger in number in T1, have greater importance in T2: they are larger and sometimes occupy the whole page.

By referring to Francesco's emphasis on sight, the visual nature of memory and on the role of imagination, Onians argues that Francesco's interest in drawing parallels precisely the growth of

67 Ibid., 91. She then points to Maltese's archeologist architect comment. See chapter four, 135, where I will explain the reason why I disagree with that qualification.
68 Ibid.
69 Ibid., 93.
70 Onians, Bearers, 171-181.

his knowledge of Aristotle. While this argument is hard to prove, Onians favors Francesco's written activity and negates his early training as well as his active hand in painting and sculpture. Francesco used drawing as a primary means of expression as a painter and a sculptor. Onians' claim could be modified to articulate that Francesco's theoretical arguments about drawing might have found a more articulate formulation thanks to his understanding and interpretation of Aristotle's ideas. By counting the number of references to Aristotle between T1 (one) and in T2 (ten in S, similar to M), Onians also postulates that in T1 Francesco was most likely to have come across Aristotle through Saint Thomas Aquinas, while in T2, he refers to Aristotle, as well as Averros and Avicenna, the Arab commentators on Aristotle. Overall, Onians argues that similar to the role of Cicero for Alberti, and Plato for Filarete, Aristotle became the guide for Francesco's *Trattati.*

While scholars grant Francesco's *Trattati* different values from the point of view of eloquence and articulation, almost all agree on the potency of his drawings as well as their character. I believe that the importance of the *Trattati* is not merely that they represent theoretical essays in architecture from the time of the Renaissance. Nor does their value derive from any role as a clear and applicable design manual. The *Trattati* are noteworthy in that they occur in two different points in the life of Francesco. Therefore T1 and T2 reveal very different views of Francesco's preoccupations. Nevertheless, while the tone and the quality of the prose evolved from one work to the other, the presence of drawings, and their number, did not change drastically. The appearance of the drawings changed from T1 to T2, and this subject will be discussed in Chapter Four.

Extensions

The partial and derivative works I have called extensions, which include the copies of manuscripts done during Francesco's life as well as the later partial copies of Francesco's drawings, are not within the framework of the present work. Suffice to say that Scaglia enumerates an overall number of 131 for the existing manuscripts and – full or partial – copies related to Francesco di Giorgio.[71] This proliferation of Francesco's drawings and ideas is not without interest, since its main objective is always the reproduction of his images. The proliferation of his thoughts through the vehicle of copying his drawing, and often without text, is another indication of the new importance of drawing as a central component of theory.

71 Scaglia, Checklist, 25-282.

In an introduction to the theoretical work of Aldo Rossi, *The Architecture of the City*, Peter Eisenman employs the term architect-writer for Rossi.[72] He further expands on the term by claiming that the tradition of architect-writer as a type is one that has deep historical roots in Italy. By referring to Alberti as the Renaissance representative of that type, following Vitruvius, Eisenman identifies Serlio and Palladio as the following generation of this particular type of architect. He claims that the ultimate value of Serlio's projects in his book is not as much in their potential realizability, but rather as "models which begin to elaborate many of the types to which Palladio would refer."[73] Eisenman recognizes Palladio's *Quattro Libri*[74] – written a decade before his death – as an epitome of his oeuvre, qualifying as much a "record of his intentions as of his actual works."[75] Eisenman emphasizes that regardless of the subject matter, varying from Roman ruins to redrawing of one's own projects, Palladio's main preoccupation was the "derivation, invention and distortion of types from existing models."[76] He concludes by affirming that the interrelationship between drawing and writing became a part of an architectural tradition thanks to Palladio's work.

The lineage traced by Eisenman in that brief introduction relates to our discussion of Francesco's work in two ways.[77] First, the coming about of the architect-writer or writer-architect as a particular type of the architectural practice frames Francesco's work from the vantage point of a writing project. Second, the emergence of a new type of architectural writing - one that employs both drawing and text - is worth investigating. While, in true Renaissance spirit, Francesco's prolific carrier covered a vast array of fields, his lifelong investment in his written works remained the central focus of his life.

In order to look at Francesco's impetus behind the making of these books, I will examine two instances. On of them is the preamble of his *Opusculum de Architectura*, which was dedicated to the Duke of Urbino. At first Francesco refers to Alexander the Great and his support of architecture,

72 Aldo Rossi, The Architecture of the City, Introduction by Peter Eisenman, Translation by Diane Ghirardo and Joan Ockman, Revised for the American Edition by Aldo Rossi and Peter Eisenman, (Cambridge, MA: The MIT Press, 1982), Editor's Preface, vi-vii.
73 Ibid., vi.
74 Andrea Palladio (30 November 1508 – 19 August 1580)'s *I Quattro Libri dell'Architettura* was published in Venice in 1570. Andrea Palladio, The four books on Architecture, Translated by Robert Tavernor and Richard Schofield, (Cambridge, MA: MIT Press, 1997).
75 Rossi, Architecture, vi.
76 Ibid.
77 Eisenman's identification is more of an episodic one than a faithful historical analysis of the writer-architects in Italy. But his argument is nonetheless important, as it recognizes both a specific kind of architect and a particular type of theory.

specifically the projects undertaken by Dinocrates; then he refers to Julius Caesar and his patronage of Vitruvius. He then likens the Duke to Alexander and Caesar, and himself to Dinocrates and Vitruvius. Fragments from Scaglia's translation of the dedication letter from Latin to English follow.[78] Francesco points out that Alexander did "appreciate this action of eager genius," as he identifies it necessary to the attack and defense of the cities, and therefore the empire. Francesco continues by claiming that "…since I have by my own genius invented various things, most worthy to be remembered but unknown to the world (if I may say so without arrogance)…" Therefore Francesco has deemed that it would be right to offer these inventions to a prince; among the princes, Federico has proved to be the most worthy. The reason for such a gift would be neither Federico's power nor his wealth, nor his wisdom, but his genius (*ingegno*)[79]. Francesco refers to the Duke's intellect twice, once by claiming that he is intelligent, and therefore would appreciate other people's brightness; then by emphasizing that the duke should accept the gift with a happy mind: "As you mainly shine by your own genius, you can not forego loving the genius of others. Therefore, accept this little gift with a happy mind."[80] Francesco then offers to undertake many projects in the future, projects that "will not be little conductive to the furtherance of your dominions, and whereto much attention is to be given."[81]

The most enticing part of the dedication however lies in Francesco's final revelation. He discloses to the Duke that "not everything which is contained in this codex should be exactly declared by means of the stylus."[82] He admits that what is drawn is only an indication of his ideas as "much resides in the mind and the intelligence of the architect rather than it can be disclosed by delineations." [83] Francesco confesses to the Duke that during the process of building many unexpected events happen, and that those are unexpected to the 'artificer' of the project. He calls on the architect's "long working experience", a habit of "daily reading" and most importantly his "agile genius" so that he can face every unexpected event that might befall."[84] That he identifies the Duke by his genius and relates himself to him by the same attribute is not accidental at all. The primacy of the cerebral nature of architecture looms large in the above-mentioned lines. Unlike knowledge and experience, genius is not something that one can acquire. Francesco implicitly urges the Duke to

78 Scaglia, Vitruvio, 42- 44.
79 Here Scaglia's translation of *ingegno* to genius seems appropriate. Francesco is in fact referring to the ingeniousness of the Duke, as he was commonly known as a very bright *condottiere* of his time. In the second chapter I will offer explanation and my translation of the term *ingegno*. However for the purpose of this chapter, it is fair to stay with Scaglia's "genius".
80 Ibid.
81 Ibid.
82 Ibid.
83 Ibid.
84 In chapter two, I will discuss *ingegno* at length which Scaglia calls "genius" and I translate as "creativity".

recognize his unique attribute and grant him an opportunity, because he, like the Duke, has an agile mind and the power to create.

Some significant traits emerge by reading Francesco's letter. Francesco traces a historical lineage, in which he likens the Duke to Greco-Roman emperors and himself to the architects of Antiquity. Therefore he argues for a space for the architect, both historically and politically. This in itself is in line with his later attempts to raise the status of architecture as mentioned in his *Trattati*. He also names his sheer genius as the impetus behind the whole corpus. Considering that the work is comprised of drawings only, the genius should be sensed by a strictly visual reading of the drawings. It is important to emphasize that this reading is not only didactic, but one that is also related to the experience of marveling at the drawings. If we pay attention to the choice of words in a passage in Francesco's *Trattati*, in which he uses the combination of "… and in the minds of the wise marvel is born"[85], the idea of looking at drawing is in line with the experience of awe. Therefore drawings are not solely descriptive. Even though the passage in question is not directly related to drawing, I believe the nature of Francesco's drawings also belongs to the realm of marvel.

Scaglia rightly argues that the drawings in the *Opusculum* are not blueprints of machines to be built, and she speculates that they are visual devices for enticing the patrons to get work and obtain commissions.[86] While I believe that the first part of her argument is correct, the role of the drawings cannot be reduced to simply an element of a shrewd strategy for finding work. Clearly, Francesco's ability to conceive those drawings would give him bargaining power. Considering that he started copying machines much earlier in his life - for a better understanding of their functions - as well as the fact that machines occupied a significant portion of his T1 and T2, Scaglia's argument about them being visual ploys is not entirely convincing. I would argue that the drawings are to be understood as portals which, once entered visually, enable the viewer to partake in the imagination of

85 Di Giorgio, Trattati, T2, 294. In referring to Vasari's account of Leonardo's cartoon of *The Virgin and Child with Saint Anne* (1501), lost and seemingly opposite in many ways to the one currently exhibited in the Louvre, David Summers suggests that the closest image to it would be the Burlington House cartoon in the National Gallery, London. In that description Vasari suggests that the simple fact of looking at Leonardo's cartoon induced *maraviglia*. Summers then refers to Ripa's description of *maraviglia*, which describes the human reaction to something new as both incorporating admiration and stupor. Summer states that to incite the experience of marveling falls within the boundaries of art, because "the artist could contradict sense through skill, disguising the relation between cause and effect, by moving great weight with little efforts, by making us see something we cannot understand how we can see." David Summers, The Judgment of Sense, Renaissance Naturalism and the Rise of Aesthetics (Cambridge: Cambridge University press, 1987), 125-127.

86 Scaglia, Checklist, 10. Scaglia simply states that "Franccesco's aim in drawing such [by referring to the machines Francesco conceived himself, such as the cars, obelisk haulers, column lifts,….] mechanisms were employment."

the architect. As such, the drawings are not mute figures. They are signs and symbols pointing to the power of the architect's creativity and allowing us to enter the realm of the work.

We do know that the drawings of the *Opusculum* were in part copies of Taccola and others as demonstrated by Scaglia[87]. Yet, similar to his use of Vitruvius' text, Francesco goes through a process of absorption, assimilation, and then transformation from the primary material of Taccola's machines to those that he claims as his inventions. Going back to Bonaventure's classification, I believe the younger writer of the *Opusculum* stands in between the boundaries of *compilator*, *commentator* and *auctor*.[88] He claims a space for drawing not as a series of visual objects, but as a medium which informs the Duke of his power of imagination by eliciting the experience of wonder.[89]

Here, I like to insist on the proximity of Francesco's drawings to a process of writing. The similarity arises as the body of machines presented in the *Opusculum* provides not a single narrative, but a multitude of narratives in each one of the depictions, as the drawings animate one's imagination with regards to how things might work. I point to the fact that Francesco does not emphasize the functional aspects of the machines but insists on their capacity to make the power of his imagination tangible for the Duke. Francesco demonstrates a well-thought and well-structured articulation of his ideas presented in drawing format. This makes me think of Francesco's drawings as a project of writing, a transfer of a mental construct to a substantial form.

I believe that in the preamble of T2, in which Francesco explains his motives in writing a book on architecture, the emergence of the *auctor* is not only tangible but definitive.[90] Here Francesco indicates that his "goal is to establish some true and founded knowledge in regards to the arts of drawing and architecture…not giving in to any fatigues."[91] While the dedication letter to the Duke renders preliminary traits for what the motives behind such works would be, the preamble of T2 is the mature articulation of Francesco's will. My two arguments, the one about authorship, related to Bonaventure's term, and the one about wonder, which relates to the role and quality of drawing,

87 Ibid, 19.
88 Ibid. Here Francesco clearly uses the word invent for his machines, but evidence suggests that part of the work was either transformed or faithful copies of Taccola's machines, the notion of invention and the variations on this theme are further dealt with in chapter three.
89 I have used the term wonder. Francesco's own term is *meraviglia*, which would be directly translatable in marvel.
90 Di Giorgio, Trattati, T2, 295, Preambolo. "|...M 1v| e desiderando in l'arte del disegno e d'architettura, parte dell'antigraficie, venire a qualche [vera e fondata] cognizione, feci fermo proposito di non perdo'nare a fatiga alcuna la quale io vedevo necessario per pervenire a questo fine,"
91 Ibid.

coincide in the notion of *ingegno*. By *ingegno*, I intend the quality specific to an author, and the capacity which can impart wonder on an object.

As mentioned previously, Eisenman refers to Palladio's work as a precursor of a new typology of architectural theory, one that binds writing and drawing. I would argue that the origin of this pattern lies in the books of Francesco, most specifically in his *Trattati*. [92] The shift that happened in transferring the locus of theory to one that employs drawings as a medium on par with text should be identified as Francesco's major contribution to the theory of architecture. Obviously, the purpose of discussion is not to establish a mere historical precedent but to recognize the power of Francesco's drawings and his intentional expressions. [93]

In this regard it would be worthwhile to point to Eric Michael Wolf's dissertation on the ecclesiastic projects of Francesco. [94] In concluding his dissertation, Wolf recognizes Francesco's earlier counterparts such as Brunelleschi and Alberti as architects who adapted the principles of Antiquity in architecture. Wolf underlines Francesco's theoretical body of work as the first illustrated work to be written in the vernacular. He states that Francesco's problematic interpretation of Vitruvius does not disqualify him from any possible merit with regard to his understanding and synthesis of Vitruvius' text. Calling Francesco's work experimental, he underlines its superiority in its formulation and presentation of architectural theory for the 16th century. Wolf qualifies Francesco's architecture as transitional, as it does not offer the highest architecture of the Quattrocento, but acknowledges its contribution in advancing avenues of interest such as geometry and proportions in ecclesiastical design.

Similarly, in his dissertation's epilogue, Betts takes Serlio's *Sette libri*, published in 1537, as the first completed treatise on modern architecture after Francesco's *Trattati*. He declares Serlio's treatise a first in the era of model books, consisting of drawings with brief paragraphs intended for the instruction of fairly intelligent men. Betts qualifies Serlio's work, not as illustrations of a theory of architectural composition, but rather as models suitable for immediate application to a building site.

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92 The similarity of attitude towards drawing in Francesco di Giorgio and Andrea Palladio's works should not obstruct a major difference in their manner of using drawing. Palladio used his own drawing as a basis for his theoretical ideas, which Eisenman rightly refers to. Francesco never ventured so far, yet his use of drawing as a vehicle for theory is one that foregrounds later works such as Palladio's.

93 For example, Francesco's drawings that manifest his theory of human analogy have often been credited as literal by most scholars. In chapter four, I will give a more extended reasoning as to why, in my opinion, beyond the literalness of drawings, there is a deeper, more meaningful connection between the drawing and the architect's idea.

94 Eric Michael Wolf, "The Ecclesiastical Architecture of Francesco di Giorgio Martini: A Study of Theory and Practice", Ph.D. diss. Harvard University, 1998.

He affirms that Serlio and his contemporaries did not feel the same obligation to investigate theoretical problems involved in reviving the practices of the ancients. Solutions to these problems were offered in the works of Alberti and Francesco; thus the following generation concentrated their effort on giving substance, in form, to the theoretical ground already prepared by these two authors.

Betts' view does not do full justice to Serlio's oeuvre, as his drawings are not immediately applicable models. To re-examine this train of thought, I suggest Francesco gave a voice to the act of drawing by juxtaposing it to the text, bestowing an equal importance to both. While he also made books with illustrations without accompanying text, as Scaglia argues, Francesco's *Trattati* offers text and drawings next to each other. I believe Betts's and Wolf's arguments can be combined, so that Francesco's work will be understood as the precursor of a new format, and therefore transitional. In this light, if Francesco's work is understood as negotiating a ground for drawing, then Serlio's work can be understood as an experimental testing of the limits of the new medium. By using drawing as the major means of communication, Serlio's work can be perceived as an indicator of the supremacy of the drawn medium. It might be helpful to borrow Onians' definition of Serlio's focus as one of setting the "principles not of architecture but architectural drawings", positing that the architect's undertaking is to "conceive and then put down on paper the design for a building."[95] Therefore Palladio's work, about a century later than Francesco's, might be understood as a phase in which the balance is regained, and drawings have found their place alongside the text.

To elaborate on these transformations of architectural theory, it is important to look at Ivan Illich's[96] critical commentary on the *Didascalicon*[97] of Hugh of Saint Victor. He discusses the phenomenon of reading as a major force influencing the process of writing. He argues for recognizing a turning point in the history of reading and writing that came about with what he calls 'the technology of alphabet' that enabled the making of the portable book. At the core of this shift, Illich identifies the transfer from reading aloud to silent reading. He argues that silent reading, which is to be understood as a contemplative act, initiated many changes in the history of reading. By referring to the techniques of allowing for space in between the words, in the 7th century BC, Illich recognizes a beginning of the shift that culminated in silent reading during the 12th century. By referring to a technique that devised space between the words as a way to recognize the independence of every word – first developed in Ireland and then spread over the monastic world –

95 Onians, Bearers, 264.
96 Illich, Vineyard, full citation in footnote 1.
97 Hugh of Saint Victor, The Didascalicon of Hugh of St. Victor: A medieval Guide to the Arts, Translated from Latin with an introduction and note, (New York: Columbia University Press, 1961).

Illich identifies a breakthrough in the tradition of writing that turned the scriptoria of the monasteries into silent rooms.

Illich also points to the shift that occurred in the process of making a manuscript, from a simultaneous interaction between the *dictator* (one who dictates) and *scriptor* (one who writes) to the less interactive patterns of writing which were also developing out of silent reading. Illich argues that prior to Hugh's time in the 12th century BC, the book was to be understood as a "record of an author's speech or dictation"; whereas after Hugh, it became "a repertory of the author's thought, a screen onto which one projects still unvoiced intentions."[98] Illich's interpretation of Hugh's work prepares us for a more sensible attention to the process of both the act of writing and the perception of the content or the reading process.

Discussing illuminations – mainly ornamentation of Christian manuscripts – Illich enumerates five different functions. He begins with the magnificence of the illuminations, and states that they embody the words and make the book a celebrated object of beauty. So their first function is to beautify the text. Secondly, he points to the didactic function of images; as the sermon was read, people would follow the images with their eyes and understand the meaning of the text. Illich refers to the third function, in which giving "exegetical and heuristic" cues about the text makes images "nonverbal vehicles for the same revelations which letters transmit as sounds."[99] To further clarify this concept, he points to a caption of a miniature that is: "*Hoc visibile imaginatum figurat ilud invisible verum,"* meaning: "this visible image represents that invisible truth."[100] By contrasting miniatures with contemporary graphs, charts or photographs, Illich identifies the fourth aspect of the illumination as something that does not aim at reducing the subject matter; rather, it invites one to adore the image. He qualifies therefore the process of reading and looking at the miniature as they "interlace ear and eye in the perception of the same delightful symphony."[101] Finally, he points to the mnemonic purpose of images. By referring to Hugh's idea of reading as a journey or an act of pilgrimage, Illich offers the analogy of a physical procession from page to page, in which images come to reinforce the idea of remembrance and become visual markers that guide one through the journey.

Without forgetting that these functions are specifically linked to illuminations of manuscripts, let us examine each of them and see how they relate to Francesco's drawings. It is true that Francesco's drawings could be understood as beautiful; also, some of his books, such as the

98 Illich, Vineyard, 95.
99 Ibid., 109.
100 Ibid.
101 Ibid.

Codicetto, could be understood as precious objects. Nevertheless, I believe the first point falls on a more subjective category and cannot be proven easily. The two other points, the appearance of the images as a complementary element to help in understanding the text - what Illich qualifies as 'didactic' - as well as a more complex set of interactions - which he qualifies as 'exegetical' or 'heuristic' - are indeed related to our discussion. First I suggest we replace the terms 'exegetical' and 'heuristic' with 'interpretative' and 'experimental'. With respect to part of Francesco's work, the drawings in the foundation series - such as the *Codicetto*, the *Opusculum*, the *Taccunio di Viaggio* - the purpose of the drawings can be understood as didactic. They aim to depict or demonstrate a set of objects, machines, and architectural elements. They aim to instruct either the architect himself, or his audience, on specific subject matters. Francesco's aim at depicting and documenting these elements embraces the idea of a didactic relationship as a first level of interaction. However, when it comes to the drawings in the *Trattati* - which have already been redrawn, examined, transformed, and thus transferred from their basis - we notice that they aspire to surpass a didactic end. Besides informing or instructing, the drawings of the *Trattati* excite or encourage interaction with the ideas postulated through the lines and the words. In order to understand them, one has to engage with them.[102]

As Illich identifies the shift from the idea of listening to the book, a sound-based practice, to that of following the contents of a book with the eye, a visual activity, it is worthwhile to dwell on the 'visual' or as called by Palazzolo, the 'optical' nature of Francesco's theory. [103] I suggest that Francesco's theory opens up the possibility of articulating architectural thought through drawings and pushes the boundaries of traditionally written theory further toward visual fields. Illich criticizes the immediacy of images in our contemporary world, due to the speed with which they are scanned and read with our eyes. I would argue that Francesco's drawings emerge from the pages of his *Trattati* and catch one's attention as if competing with the text. In one instance, Illich qualifies the book as a 'visible but intangible' artifact. In combining drawing and writing, Francesco was able to change the attributes of a book in the field of architectural theory, and change it into a visible and more tangible artifact.

With respect to Francesco's theory and the way it is rendered tangible through drawing, I suggest we differentiate between the term 'illustration' and 'drawing'. An illustration relates a

102 Notwithstanding, as Illich has argued is the case with the relationship of drawings to concepts or of drawings to text, one has to argue that Francesco's drawings are in a way also experimental or interpretive. These two categories are related to other discussions and will be discussed at length in chapter three and four. Here it is enough to point out that Francesco's idea of drawing is at core an investigation that implies an experimental process. Illich's fourth point, that illuminations do not reduce the text but rather augment it, is one that is also very important and is discussed in Chapter four.
103 Palazzolo, "Francesco" in Domus. No page number indicated. See footnote 26.

narrative to one or a series of images, and there is coherence between the image and unraveling of the narrative. Illich argues that illustrations do not necessarily depict the narrative faithfully; instead, they can illuminate one's ideas of the narrative. While Francesco's drawings are not entirely outside the boundary of illustration, they do not merely depict specific moments or aid one to remember the text. Rather, by their specificity and articulation they claim an identity of their own. Many of Francesco's drawings can be understood, to a great extent, as articulations of an architectural idea: some can even survive without the text. The tangible aspect of drawings overpowers the presence of text, as the visualization of the drawing precedes the reading of the text.

Illich argues that the difference between reading with "tongue and ear" and reading with the eyes led to the transfer of reading from "sound patterns" to "visual symbols of concepts"[104]. He claims that the practice of reading which was a "vineyard, a garden, or the landscape for an adventuresome pilgrimage" prior to silent reading, became more of a "treasury, the mine, the storage room -- the scrutable text."[105] I would argue that the abundance of drawing in Francesco's *Trattati* provokes a different reaction. The fact that one could contemplate and at least partly understand the drawings in their own right allows the eye to participate in a journey. This journey's pace is not as firmly structured by particular rituals as the pace of a pilgrimage. The act of contemplating Francesco's drawings is akin to exploration. I would argue that the abundance of the drawings allows one to deliberately wander within the fields of Francesco's ideas and marvel at them. It is important to understand that this wandering is not completely random, because the drawings are related to a specific text. Since the drawings are grouped around themes - such as temples, houses and machines - they also make sense in groups and in conjunction to each other. While Illich qualified the idea of listening to a book as a physical and hard pilgrimage, I would associate the visual reading of Francesco's work with a more deliberate and intentional wandering.

Illich explains that the changes which occurred in the structure of the text led to its disruption as a continuous flow: the text underwent an interruption and systematization that were both formal and structural. On the formal level, Illich points to the paragraphs, capital letters, and so on that indicated a visual hierarchy. He also points to the structural changes in content; these include breaking down an argument by enumerating reasons, acting as respondent to a certain argument, and so on. Illich argues that the visual form of the page has a critical impact on one's experience of the text, because the eye scans the page. This is a simple argument; however the notion of a visual reading of the *Trattati* shapes any reader's first encounter with Francesco's ideas.

104 Illich, Vineyard, 95.
105 Ibid.

Illich also talks about the layout, the format of the page, as another factor that reveals much about the nature of the book. In Francesco's *Trattati*, specifically in T1 - which is the compendium of the younger, less-educated, and less-reserved architect - in certain instances the drawings follow the more common pattern of staying in the margins of the text. However in most cases they also travel to the other edges; on occasion they border and almost invade the text, claiming the territory of the page. Unlike the *Codicetto*, the artist's sketchbook, the *Trattati* as we have inherited them are copies done by the hands of artists and scribes. This means that they are not free flowing ideas: they have already been through a filter, and therefore the overpopulation of the page by drawings is not accidental. The abundance of the drawings and their appropriation of all the margins in Francesco's *Trattati* is an indication of their implicit and explicit richness in demonstrating the architect's thought.

As Illich's attention is focused on the center of the page and its layout, it is pertinent to bring another voice to this discussion: a voice of a scholar who examines the text from a different point o view. Michael Camille studies an entirely different phenomenon in a book on the marginal images of the Middle Ages.[106] His examination of the role of margins in relation to the main text, focusing on manuscripts of the thirteenth century, adds another reading to our discussion. Pointing to the rapid growth of marginal art in thirteenth century, Camille relates this growth to "changing reading patterns, rising literacy and the increasing use of scribal records as forms of social control."[107] Camille states that the objects in the margins "add an extra dimension, a supplement, that is able to gloss, parody, modernize and problematize the text's authority" without entirely undermining it.[108] Camille claims that the center is much dependent on the margins, for these extend a continued existence to the text. Resonant with Illich's point of view, Camille refers to the fact that the gradual transformation of manuscript into "a matrix of visual signs" interrupted "flowing linear speech", and therefore the stage was opened up for not merely "supplementation and annotation, but also for disagreement and juxtaposition."[109] In another instance, Camille points out that these motifs do not always refer to the text; sometimes they are connected to each other and the images connect the entire manuscript like a chain.

I would argue that even though Francesco's drawings are typically assigned to the space of the margins, they are not a series of marginal additions to the text; neither are they subservient to the text. Camille identifies the margins' intent as one of dominating the core of the page. This happens in

106 Michael Camille, Image on the Edge the Margins of Medieval Art (London: Reaktion Books, 1992).
107 Camille, Image, 10.
108 Ibid.
109 Ibid., 21.

Francesco's work to a certain extent, but in a different manner. Camille distinguishes a polarity of the mainstream versus the marginal traits of religious or socio-cultural realities of the late Middle Ages. Francesco's drawings do not challenge the content of the text; since they are meant to clarify the textual content, they are in no way in opposition to the text. I like to use the analogy of the river and the stream.[110] The main text in Francesco's *Trattati* represents the river, and the drawings represent the streams which flow into the river. Therefore the supremacy of the text is not exactly challenged; the text is still identifiable as the river. Yet the multitude of the streams and their individual significance overthrow the strict hierarchy between the text and the drawing, while augmenting the authority of the text in question.

It would be important to refer to another work that studies the incorporation of drawings in the *Trattati*. In tending to Francesco's juxtapositions of words and drawings, Margaret Muther D' Evelyn[111] refers to Francesco's identification of "superfluity" as related to excess and wordiness, and argues that he attempted to escape from such symptoms by making the text shorter and by adding drawings. She suggests that Francesco uses the notion of necessities, as incorporating what is appropriate and useful in opposition to the superfluous. D' Evelyn suggest that for Francesco, practicing architecture as well as writing a book of theory consists on coming up with inventions, which should be adjusted through avoiding the excessive and tending to the essential, complete only by "a necessary and natural abundance of Drawing."[112] Overall D' Evelyn likens Francesco' use of drawings, to techniques in rhetoric, by arguing that Francesco transfers part of what had always been the domain of text as a way of conveying meaning to drawing. She suggests that gradually Francesco used less and else text, and supplied more drawings such that that the later version of the second iteration, manifests a "largely technical text" combined with drawings that represent "often mathematically-based facts of that text."[113]

I do not wish to argue for some inverted hierarchy. My sole intention is to demonstrate that Francesco's *Trattati* clearly has destabilized the authority of the text by claiming an equal right of existence for drawings. This is particularly true in comparison to the paradigmatic theory of Alberti, generated in the spirit of Renaissance humanism and its textual basis. The *Trattati* drawings are not meant specifically for patrons, nor are they addressed to master masons. Francesco's drawings dwell

110 In many instances in the *Trattati* Francesco uses water-related analogies to describe his ideas. In Martinian style I deem it appropriate to use a similar strategy.
111 Margaret Muther D'Evelyn, "Word and Image in Architectural Treatises of the Italian Renaissance," Ph.D. diss. Princeton University, 1994. Chapter one is entitled: "Sign and Signified in Defense of Drawing" studies Francesco's use of drawings, 10-49.
112 Ibid., 35.
113 Ibid., 37.

in a middle ground, between medieval building practice and the realm of liberal arts. They belong to a darker, less visible plane in which the imagination of the architect is at work. Similar to figures emerging in day-dreams from forms of clouds, they are not images, but indications of one's thoughts and intentions.

CLOSING

This chapter started with Lucian's recounting of his categorical preference for culture over craftsmanship. In the brief account presented of Francesco's life and works, his attitude appears as more complex and subtly opposed to Lucian's. One of Francesco's drawings can be used as a parable to illustrate that difference. The drawing in question is Atlante[114] (figure 1), or Atlas, drawn circa 1470-1475. The posture of Atlas, manifesting the twist and bend in his body, reflects his physical pain in carrying the weight of the heavens. Captured in an eternally precarious position, Atlas manifests a simultaneous strength and vulnerability. In addition to his body, his facial expression depicts the intensity of his distress.[115] Andrea de Marchi identifies Francesco's depiction of Atlas as a 'humanistic' portrait in opposition to medieval iconography. [116] The tension between the pressure applied to his body and the supposed stability of the cosmos - both heaven and earth are presented in circular forms presented as ellipses due to perspective - creates a dynamic equilibrium. Also his eternally fixed position is in contrast with the shape of his hair and dress, indicating their exposure to an invisible wind. De Marchi alludes to the dichotomy between human rationality and the fatalism of astrological destiny[117] as another level of opposition that can be read in the drawing.

In light of what is discussed in the present chapter, a parallel is to be made with the position of Atlas and the difficult task of the architect. Atlas, impersonating the architect, or the writer-architect, has a foot in practice and a hand in theory. Being aware of the instability of his position, he tries to keep all in balance and assume the consequences of fulfilling such a grave task. Francesco lived his life as an artist; busy with his hand, and 'his gaze directed towards the earth' as Lucian would have put it.[118] Yet from the early years of his adult life, he constantly strived to conceptualize and

114 Braunschweig, Herzog Anton Ulrich Museum, inv. Z 292, Pen on Parchment, mm 330 x 235.
115 Weller, Di Giorgio, 235. Weller confirms the attribution of Atlas to Francesco since it combines "an exceedingly bold design" with inadequate anatomical knowledge.
116 Francesco di Giorgio Martini e il Rinascimento a Siena (1450-1500), A cura di Luciano Bellosi (Milan: Electa, 1993). Catalogue entry by Andrea di Marchi, 306.
117 Ibid., 306. De Marchi references his reading to Francesco di Giorgio's preamble to *Trattato II*, in which he praises the existence of reason in the minds of the virtuous people. Later he explains that his fate has been influenced by being born under the influence of Mercury. See Di Giorgio, Trattati, T 2, 294.
118 Lucian, Works, 5.

render his intelligible thoughts into a structured body of written works – of books. Therefore his intentions are at core different from those artists who produced in only one mode.

Francesco's books – which are not ordinary books but rather books in which drawings abound – populate the span of his life. These books with drawings do not appear as an appendage to the body of his artistic or architectural work, but rather act as a foundation upon which the rest of his work is built. While Lucian presented the writer's dilemma in choosing either the low form of art (one that is concerned with making) or the high form of art (which is the realm of ideas) Francesco's lifework was essentially an extended act of bringing together, closing in, and reuniting the two seemingly opposite sides of his practice. He did so through writing and drawing. In shaping his thoughts into this amalgam of writing and drawing, Francesco ultimately appears as having attained the position of the '*auctor*' as described by Bonaventure.

FIGURE 1. ATLAS CARRYING THE WEIGHT OF THE HEAVENS
CIRCA 1472-5
Pen and brown and red ink, over underdrawn traces on parchment, 33 x 23.5 cm
Herzog Anton Ullrich- Museum Braunschweig, Kunstmuseum des Landes

CHAPTER TWO
DRAWING THE LINES OF THEORY

"Verbal distinctions should be valued, since they stand for mental- intellectual-distinctions."[1]

Jorge Luis Borges

DRAWING THE LINES OF THEORY

OVERTURE

The Quattrocento bore witness to three major works in the theory of architecture: *De Re Aedificatoria*[2] (1452) by Leon Battista Alberti (1404-1472); *L'Archtiettura* [3](ca. 1464) by Antonio Averlino, known as il Filarete (ca. 1400- ca. 1469); and *Trattati di architettura, ingegneria e arte militare* (ca. 1475-1490) by Francesco (1439-1501). Each of these three authors developed a body of architectural theory for their contemporaries and posterity. While they differed in language, focus, and ability, they shared a motivation to lead architecture towards the liberal arts.

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1 Jorge Luis Borges, This Craft of Verse: The Charles Eliot Norton Lectures 1967-1968. Edited by Calin-Andrei Mihailescu (Cambridge, MA: Harvard University Press, 2000), 43.

2 Leon Battista Alberti's *De Re Aedificatoria* has two Italian and two English editions. From now on, any reference to Alberti will refer to the edition by citing that edition. The more recent translation is L. B. Alberti L'Architettura, traduzione di Giovanni Orlandi, Introduzione e note di Paolo Portoghesi, (Milan: il Polifilo, 1989). The other Italian translation is: L. B. Alberti: L'Architettura di Leon Batista Alberti, Tradotta in lingua Fiorentina da Cosimo Bartoli Gentil' huomo & Accademico Fiorentino. Nel Monte Regale Appresso Lionardo Torrentino nel mese di Agosto. Repr. Ed. Venezia 1565, (Sala Bolognese: Forni, 1985). For the English translations there are two versions, first: L. B. Alberti, Ten Books of Architecture, Translated by James Leoni, (1755, Reprint New York: Dover, 1986) and L. B. Alberti, On the Art of Building in Ten Books, Translated by Joseph Rykwert, Neil Leach, and Robert Tavernor, (Cambridge, MA: MIT press, 1988).

3 Antonio di Averlino il Filarete, *Trattato di Architettura*, Testo a cura di Anna Maria Finoli e Liliana Grassi, Intorduzione e note di Liliana Grassi, Classici italiani di scienze, techniche e arti.(Milan: Il Polifilo, 1972). For the English translation: Filarete, Treatise on Architecture; Being the Treatise by Antonio di Piero Averlino, Known as Filarete, Translated with an introd. and notes by John R. Spencer, Yale publications in the History of Art, 16 (New Haven: Yale University Press, 1965).

Reviewing the Albertinian tale of '*Fatum e Fortuna'* from the first book of *Intercenales*[4], provides some insight into the world of the above-mentioned writer-architects. The story strives to demonstrate the superiority of impartial *Virtù* over the capricious moods of *Fortuna.* In the dedication letter that precedes the first book, Alberti reiterates that "even though virtue should forever prove inimical to fortune, still we must never abandon virtue."[5] In *Fatum e Fortuna*, the landscape of a *somnium* juxtaposes a visual allegory and a moralizing theme. The narrator of the story, a philosopher, who is truly an author (read "architect"), recounts his dream by taking us to the after-world. The philosopher awakens in a mountainous area, where he sees a turbulent river and notices that some indistinct shadows fall into it and in doing so they turn into human beings.

While the river represents life, the river banks signify death. The shadows, knowing that clinging to the banks will make them die, are to 'live' in the river. They tell the philosopher about the perilous fate each swimmer will face. Some people decide to swim and rely only on their own strength. They are "industrious, venerable, studious, prudent, active, and temperate."[6] Another group, relying on floating on top of anything that they can cling into, are the unworthy. They favour wealth or status and commit "perfidy, thefts, impiety, and dishonesty."[7] Some board boats of various sizes, some ride in the stern, and some repair the boats. These boats represent empires. The gods will respond well when the boats' passengers behave with "moderate desires, just behaviour, upright wisdom, honourable deeds, and splendid thoughts."[8] Each boat has a ruler, who is characterized by degrees of character and virtue. People in the boats, however, are no more immune from the swift currents than the ones in the river. The shadows reveal to the philosopher that people "who… cling wholeheartedly to planks and by looking freely in every directions seek the safest course" are among the most virtuous. The planks to which these swimmers trust their lives are called "liberal arts." [9]

At that point, the story takes a different turn and focuses on the nature of the planks and the work that is done on them. Eventually, the philosopher is encouraged to pay his respect to one

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4 Leon Battista Alberti, Dinner Pieces, A translation of Intercenales by David Marsh, Medieval and Renaissance Text & Studies V. 45. (Binghampton, NY: Medieval & Renaissance Texts & Studies, in conjunction with the Renaissance Society of America, 1987). *Intercenales* is a collection of moralistic stories meant for delighting the audience at the table. I first found a reference to the tale found in a book on Alberti. Cf. Mark Jarzombek, On Leon Baptista Alberti, His Literary and Aesthetic Theory (Cambridge, Mass.: MIT Press, 1989).

5 Alberti, Dinner, 15. Alberti's preface to Paolo Toscanelli emphasizes the main undertone of the first book, as the constant human grappling with virtue and fortune.

6 Ibid., 24.

7 Ibid.

8 Ibid., 25.

9 Ibid.

particular group. Separated from others, this group is made of shadows with wings and winged sandals that "glide nimbly and easily over the waves."[10] People of this group are "perfectly candid and uncorrupt, their wings signifying truth and candor and their winged sandals contempt for transitory things."[11] They are considered gods not only for their divine traits, but also because they first offered aid to swimmers by inscribing the names of the liberal arts on the planks. Others, though similar, do not rise as high, and their wings and sandals are imperfect: "these are demigods who enlarge the planks by adding fragments to them, and delight in gathering them from between the rocks and from the farther bank, in fashioning new planks of similar shape and purpose, and in offering all their works to those who swim."[12] Alberti advises us to "pay them honour… and give them due thanks, for by these planks they have lent excellent aid for completing the toilsome journey of life."[13] At this instance, the writer-philosopher-architect becomes the one who provides an alternative to the harshness of life. This alternative alleviates the burden of life, and therefore makes journey possible. The writer-philosopher-architect strives for virtue through working on the planks and making others' lives more virtuous.

As such, this brief tale, although it appears to be primarily intended as a commentary on fate and fortune, reflects Alberti's concern about the philosopher-writer's role - his own role indeed - in relation to the liberal arts.[14] The main theme of Alberti's tale of fate and fortune gravitates around the writer's role and position. Alberti classifies the planks into two kinds, those created ex-nihilo, and those modified and added to by demigods. Significantly, his most virtuous shadows are those who contribute to the liberal arts, either by "adding to the planks or creating whole new ones."[15] Alberti's tale vividly renders the backdrop for an investigation of written works of architecture in 15th century. The image of the demigods, working on the rafts of liberal arts, is what we should keep in mind when we look at the three above-mentioned architectural treatises.

In the story, the writer-philosopher, whose fixed gaze remains on the group working on the planks, claims that he distinguishes a distant shade in the category of demigods—perhaps referring to Alberti himself.[16] In fact, looking carefully at the tumultuous river of Quattrocento, one can see at

10 Ibid., 26.
11 Ibid., 27.
12 Ibid.
13 Ibid.
14 I believe the architect belongs to the same category, as Alberti identifies with the writer and also with the architect-writer. Another reason for such an inclusion is that he recognizes all that work in different fields of liberal arts as the ones working on the planks.
15 Ibid.
16 In Marsh's translation, after having heard about the gods and demigods, the philosopher (Alberti) claims that he "felt a wondrous desire to be counted among the winged gods." Alberti, Dinner, 27. In Jarzombek's

least three shades who dedicated their efforts to other swimmers. These three figures are: Alberti himself; Antonio Avrelino, il Filarete; and Francesco di Giorgio Martini. With a shared aspiration of raising the status of architecture, they each, relying on their own 'virtues', worked on their own 'planks'. The main aim of this chapter is to describe the specific characteristics of Francesco's *Trattati*, from the point of view of drawings, followed by an investigation of his formulation of the role of drawing in contrast to his contemporaries.

A NEW FORMAT

In order to qualify Francesco's *Trattati* from the standpoint of format, his work is to be understood in relation to its historical precedents. On one hand, Francesco's *Trattati* is placed within the larger category of books with drawings, which existed from the Middle Ages all through the Renaissance. This field includes a wide range of books with different purposes, varying from illuminated manuscripts, to the different variations of artists' books (such as model-book, pattern-book, and sketchbook). On the other hand, in the immediate context of the Quattrocento and in the field of architectural theory, Alberti and Filarete authored their treatises on architecture in a very close span of time to Francesco's *Trattati*. Consequently the inquiry into Francesco's contribution to a new mode of expression in architecture is followed along these two specific paths, one of them looking at how drawings evolved through the hands and minds of artists, and the second at more specific manifestations of drawings – or lack thereof – in areas particular to architectural theory.

Writing about the drawing practices of the Renaissance, Francis Ames-Lewis distinguishes two kinds of books that contain artists' drawings: the model-book and the sketchbook.[17] He suggests that the model-book originated from the medieval artists' pattern-book. By referring to R. W. Scheller's work entitled *Exemplum: model-book drawings during the Middle Ages*[18], Ames-Lewis explains that some drawings in these pattern-books were not destined for any particular purpose, nor were they sketches in pursuit of specific concerns. They were copies that constituted an essential element

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interpretation Alberti confesses: "I seemed, in a marvelous way, to have somehow managed to be numbered among the winged gods." Jarzombek, Alberti, 132, 132(2).

17 Francis Ames-Lewis, Drawing in Early Renaissance Italy (New Haven: Yale University Press, 2000). The book investigates the act of drawing and its transformation, from being in service of painting to its gradual gain of autonomy and character as an 'art from' during the second half of 15th century. It expands on practices pertaining to painting primarily. Ames-Lewis later adds another species to these categories which he names drawing-book.

18 Robert W. Scheller, Exemplum: Model-Book drawings and the practices of Artistic Transmission in the Middle Ages, (ca. 900-ca.1470), Translated by Michael Hoyle, (Amsterdam: Amsterdam University Press, c1995), 1-7.

in the artist's workshop and were copies of others' work. To make such copies of works in different locations, the artist had to travel and record works that interested him. The most well-known series of the sort is the pattern-book of the medieval architect and master mason, Villard de Honnecourt, which was made during a journey he made circa 1230.[19]

Villard's book, containing a variety of subject matters such as human and animal figures, architectural drawings, mechanical devices, machines and automata, is the most established example of early pattern-books.[20] The similarities of the later generation of pattern-books to Villard's book suggest that his work was indeed a precursor of this particular type of investigation common to the following generations of artists and architects. While Villard's drawings included some of the more accurate accounts of architectural drawings on Laon and Rheims Cathedrals, they also paved the way for the inclusion of machines, figures, and other elements, which in turn were reflected in the works of Mariano Taccola, Francesco and Leonardo da Vinci. Ames-Lewis remarks that the travel observations of the artist were later "augmented by the theoretical and practical studies done in the workshop", which made the pattern-book "a cumulative record of artistic experiences to be consulted for ideas when new projects were being planned or executed."[21]

As for model-books, Ames-Lewis claims that the type was generated from the idea of pattern-book and had an analogous purpose, but the main difference lay in the style of execution and format. He states that model-books often provided "a collection of studies of individual formats or motives... intended as a stock of exemplars for the transfer to finished work."[22] He observes that the more systematically organized the model-books were, the more restrained their field of investigation would become _ as opposed to their forefather, the pattern-book, which demonstrated more freedom during the documentation and use period. He also points out that the model-book became more removed from real life, as the practice of copying and collecting more copies of others' drawings became more common, not only among the apprentices but also among the artists.[23]

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19 Villard de Honnecourt, Hahns R. Hahnsholer Kritische Gesamtausgabe des Bauhüttenbuches ms. Fr. 19093 der Pariser Nationalsbibliothek (Wien: A. Schroll, 1935).

20 Perhaps it is necessary to emphasize that while Ames-Lewis considers Villard's book a pattern-book, others might categorize it as a model-book. As far as this particular study is concerned, the importance lies in the more significant difference between the sketchbook and either pattern- or model-book. Therefore the over-specific determination should not eclipse the main purpose of the discussion.

21 Ames-Lewis, Drawing, 63. Ames-Lewis later offers an example of Giovannino's leopard and the later copies, by suggesting that the farther the copies were from the original source, the more they would decline and become less authentic in their depiction of the original source. The same issue is true with regards to Francesco's drawings.

22 Ibid.

23 Ibid., 65-66. Ames-Lewis also points to the fact that model–books were understood as a significant tool in the beginning of the 15th century, as they became an established element in the artist' workshop. They

From the model-book evolved a new type: the sketch-book. Ames-Lewis enumerates two factors with regards to that shift: a greater range of subject matter, and a more deliberate treatment. As well, through looking at Jacopo Bellini's drawing-book, he refers to randomness and unfinished quality of the work. He states that the more experimental sketchbooks were particularly developed in central Italy, where he identifies Pisanello's drawings, the most elaborate and extensive drawings prior to Leonardo Da Vinci's notebooks. He believes that Pisanello's drawings manifest careful studies of subjects at hand. Ames-Lewis also refers to another series of drawings by Pisanello, which seem to have been hastily executed and arbitrarily placed on the page, arguing that they might have happened in a much more spontaneous fashion. Further, he discusses another significant archetype, called *Taccuino di Viaggio*, emanated from Gentile da Fabriano's Rome workshop, and inherited by Pisanello in the late 1420s. Ames-Lewis suggests that this *Taccuino* is an amalgam of model-book and sketch-book, as it manifests a constant annexation and addition, wherein an experimentational quality is presented quite strongly.

To sum up, the model-book and the sketchbook share the role of recording an artist's observations; however, they differ from each other in terms of the nature of the recording process. Essentially the model-book represents a more systematic collection of specific subject matters, such as animals, architectural fragments, and figural studies. A sketchbook, in turns, documents elements in a more spontaneous and selective manner. The other difference is a more subtle one[24]: while both model-books and sketchbooks were part of an artist's workshop, the model-book appears as a more general and public object in face of the more personal and private nature sketchbook. Most importantly, in terms of time-frame, the sketchbook comes across as a more liberated successor of the model-book as shown by Ames-Lewis.

This brief genealogy acts as prelude to examine Francesco's work. His body of written work, as introduced in the first chapter, includes a substantial and somewhat overwhelming quantity of drawings. These drawings vary from quick sketches – perhaps executed on site, in Francesco's travels to study ancient ruins – to presentation drawings, which demonstrate the mastership of his hand and

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indicated the workshop's prestige by their size, variety and content. He points to the Bergamo book, known to have belonged to the Lombard artist Giovannino de Grassi, indicating that some drawings' accuracy and level of detail suggest a direct study from nature.

24 They were both circulating in the workshops, and even occasionally got in the hands of other people. There are accounts of Francesco having owned Taccola's book. The best exemplification of a sketchbook might always be Leonardo da Vinci's notes, which manifest the most profound secrecy, along with the desire to keep the notes as private as possible. Francesco's Codicetto is also an apt candidate for the type.

were done as samples for potential clients[25]. In the scholarly realm, Francesco's work, and specifically his architectural drawing, has been described with terms that vary from "architectural picture-book"[26] by Joseph Rykwert to "textbook" by John Onians.[27] The somewhat perplexing variety in Francesco's works is worth studying.

In essence, Francesco's books (as we have called them) carry traces of all the above-mentioned types in them. While Francesco's drawings of Antiquity can be understood as sharing the same ambitions of itinerant artists/architects of the Middle Ages, his *Codicetto* clearly shows the traits of a sketchbook, and his *Opusculum* could be understood as a specific model-book of sorts as it documents and investigates the theme of the machines and their purposes. These works can be understood in continuity with the lineage of artists and architects reaching as far back as Villard's sketchbook.

We find similar uses of the sketchbook format by Francesco's counterparts such as his mentor Mariano di Jacopo, Il Taccola (1382-c. 1453) and, more prominently, Leonardo da Vinci (1452-1519).[28] The practice of using sketchbooks in order to record, investigate, and document ideas was not a novelty during the Renaissance. Yet the sketchbooks were primarily private notebooks. The private nature of sketchbooks and the one-dimensional nature of picture books can be distinguished from Francesco's drawings in *Trattati*. Leonardo da Vinci's notebooks, which are a unique example, offer a juxtaposition of writing and drawing and reveal an ongoing investigation by the author. Nonetheless, their very nature suggests secrecy and makes them largely inaccessible to a general audience. They can be called conversations with oneself. On the other hand, the sketchbooks of the Renaissance, playing a prominent role in recording thought, served as a means of reflection, inquiry, and research. Thus, while the picture-book simply acts as a visual *aide-memoire*, the sketchbook acts as an intellectual fertile field, wherein the artist or architect would plant seeds of his ideas and go back to reflect on the evolution of his thoughts.

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25 These presentation drawings are printed in Bellosi's Rinascimento.).
26 Rykwert's position will be discussed shortly. See footnote 29.
27 Onians, Bearers, 171. Onians has used this expression as the title for one the sub-chapters in his chapter on Francesco, entitled: "The manuscripts: from notebook to textbook". However there are no specific elaborations on the reasons why he calls *Trattati* a text-book. I believe his terms demonstrate Francesco's willingness to move beyond the personal realm and attain a public character, which is also part of the argument I have made. Onians is very specific about the importance of Francesco's drawings, as he identifies the issue of drawing as a very unique character of Francesco's work.
28 Mariano di Jaccopo, il Taccola, De Machinis, The engineering treatise of 1449 (Wisebaden: Reichert, 1971) and Leonardo Da Vinci, Leonardo da Vinci's Note-books, arranged and rendered into English with introductions by Edward McCurdy (New York: Empire State Book Company, 1923).

The format of the *Trattati* is close to that of a sketchbook, because it contains text and drawings. Nonetheless, it is of outmost importance to bear in mind that the *Trattati* were meant for an audience. As well as being a mode and means of reflection for the author, they established a dialogue between him and his readers. While the format of the sketchbook was convenient for Francesco and has been embraced by his intended audience – architects and other people interested in *arti del disegno* – the public agenda takes the *Trattati* beyond a mere picture-book or even a sketchbook, as the pairing of images and text manifests an intentional sophistication that a picture-book lacks. However to simply qualify Francesco's *Trattati* as following one or another category of drawing book, or as a text book, results in overlooking the most specific characteristic of his work: the presence of drawings, and the role they play with regards to his theoretical formulations. Francesco's insistence on the importance of drawing is consistent with the place they occupy in his *Trattati*. His undertaking is to put forward a comprehensive body of theoretical work that sheds light on his practice; as such, the pairing of drawing to text should be understood as aspiring to a much higher destiny for his *Trattati* than that of an architectural picture or sketchbook.

Now that the terminology has been briefly reviewed it is time to look at Francesco's work in relation to the more specific range of architectural treatises of his time. The first point of comparison is the work's format. While Alberti's treatise does not call for drawings, Filarete's work, following the medieval tradition, uses drawings as illustrations. On the other hand, Francesco's work would be meaningless or incomprehensible without drawings. To judge the attitude of each writer solely on the work's format may seem simplistic, but the choice of format is deeply related to their ideas about drawing as I will demonstrate in the following passage. In tandem with this position, Onians also points to the singularity of Francesco's *Trattati* from the standpoint of the presence of drawing.

Comparing the treatises of Alberti and Francesco, Rykwert[29] recognizes that Vitruvius's work, as a model, is the common point of departure for both authors. Rykwert distinguishes Alberti's work as "a rhetorical exercise, a plain un-illustrated text which owed as much to Cicero and Quintilian as it did to Vitruvius."[30] He also characterizes Francesco's work as more of "an architectural picture book, in which, engines, war machines, and fortifications are as prominent as buildings and their history."[31]

29 Joseph Rykwert, "On an (Egyptian?) misreading of Francesco di Giorgio", Res, Peabody Museum of Archaeology and Ethnology, Harvard University, No.1, (1981): 78-83.
30 Ibid., 78.
31 Ibid.

Going back to Rykwert's observation, one should say that his argument about Alberti is fair: *De Re Aedificatoria* draws upon intellectual ideas, history, and philosophical observations to create a full body of architectural theory. Alberti did not intend to address only architects, for his work was for "princes and merchants, for the patrons – perhaps for them primarily."[32] The type of audience is crucial, since Alberti did not deal with the detailed process of design so much as he elaborated other issues to impress his learned audience with his erudition and knowledge of Greek and Roman literature. As such the book, undertaking to educate on the art of building, primarily acts as an intellectual discourse and aims to make architecture meaningful with the help of history, philosophy, and poetry and imagination. *De Re Aedificatoria* is not a 'how to design' book; rather, it aims to cultivate the audience's capacity for understanding, developing judgment about, and enjoying architecture as a high form of liberal art that creates pleasure, makes our life commodious, and responds to our utilitarian needs. While Rykwert is obviously right about the nature of Alberti's work as a humanist text, his assessment of the *Trattati* is problematic. In the *Trattati* drawings spill over from page to page as if the author were anxious he might run short of space. They populate the theoretical text as either prominent elements or inseparable counterparts of it. The theoretical premise of *Trattati*, meant to inform and instruct, negates an immediate use. To make this argument clear, it is necessary to go through the pages of *Trattati* to see in what manner the drawings are referred to in the text.

In his book, *Architecture in the Age of Printing*,[33] Mario Carpo speculates that Francesco "returns…to the humanistic topos of architecture as the child of drawing."[34] Carpo emphasizes that Francesco's insistence on drawing, not only fortifies the role of drawing in design but also rationalizes its use in an architectural discourse. In contrasting the treatises of Alberti and Francesco, Carpo speculates that Alberti's theories did not need images, as they were about establishing rules. In turn, he identifies Francesco's drawings of the orders as giving the impression of "creative or capricious disorder, as in a personal sketchbook."[35] While Carpo's qualification of Francesco's work might not do justice to the nature and scope of the work undertaken in the *Trattati*, his recognition of Francesco's use of drawing as a vehicle for theory is essential.[36]

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32 Alberti, Art of Building, Rykwert Edition. x. (Introduction by Rykwert)
33 Mario Carpo, Architecture in the Age of Printing: Orality, Writing, Typography, and Printed Images in the History of Architectural Theory, translated by Sarah Benson, Cambridge: MIT Press, 2001).
34 Ibid., 125.
35 Ibid., 127.
36 Carpo further extends his argument by explaining that Francesco's drawings were not meant to be reproduced, as he did not have any intent in normalizing a method, while Alberti's theory aimed at providing timeless principles, and therefore did not need drawings. Carpo identifies Alberti's ultimate goal as that of attaining "visual standardization". Without undermining the value of Carpo's investigation, I believe Francesco's aim was providing a theory of architecture just as Alberti's. There are no doubts that each author's

If we flip through any of the pages in either T1, or T2, every paragraph or passage that describes or explicates a specific topic ends with one of the following expressions: "as it appears in figure… /drawing …".(*come appare nella figura… /nel disegno…*, or *come si manifsta nella figura….*). Francesco uses the verbs: demonstrate, show, clarify, manifest, signify and designate (*dimostratre, mostrare, dichiarare, manifestare, segnare, and disegnare*) frequently and interchangeably in both T1, and T2. Most often drawings are referred to as either *figura*, or *disegno*, and sporadically as *pittura* and *esempio*. A subtle yet perceptible change from T1 to T2 is that in the latter these references are sometimes qualified with adverbs such as: better, more sensibly, openly, perfectly, plenty of information (*meglio appare, meglio disegnare, sensibilmente appare, apertamente, perfettamente, piena notizia).* The qualification of verbs by these adjectives bestows a greater degree of importance upon drawings.

In many of those instances, Francesco provides a drawing as a way of either demonstrating or clarifying the topic in question. Therefore Francesco's first and foremost objective should be understood as attaining clarity through drawing. As an example, while describing the house of craftsmen in T2, Francesco states: "as all of this is better described through drawing, I made many in different forms."[37] In many places, Francesco is vocal about his preference for drawings over words because of their ability to render his thoughts, such as the following passage on Temples in T2: "These things [referring to vaults in temples] appear better in detailed drawings that I will immediately present as example, of my invention, so as to not proceed in superfluous words and annoy the readers, as inventions can proceed infinitely."[38]

A second purpose, less often pronounced yet important, is the capacity of drawings to allow one to choose from examples in a way that text does not. In a rare instance, Francesco describes the reason for providing a few drawings for a chandelier. He explains that "even though chandeliers are not a part of the temple, but added ornaments, to avoid unnecessary confusion, in order to describe their ornaments in words, I demonstrate diverse figures in their design and form, from which one

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means, as well as his intentions were different. I have attempted to clarify some of these points in discussing the notion of drawing for each of the three writers in the following passages.

37 Di Giorgio, Trattati, T2, Forme di Rocche e Fortezze, 436. "Molto altre forme in qualche parte da queste differenti netterò nel disegno, per lo quale meglio saranno manifeste."

38 Ibid., T2, I Templi, 411. "...le quali cose meglio apparranno nelle particulari pitture le quali io porrò immediate per semplo, di ia invenzione, per non procedere in parole superflue e dare fastidio alli lettori, peroché le invenzioni posssono procedere in infinito."

could choose any that pleases him/her."[39] Here he is providing drawings so that the reader could select one at will. The fact is that the wide array of drawings to choose from fortifies the primacy of the eye, and tips the balance towards the visual sphere from the textual. Drawing therefore enables one to make up his mind as to which solution to pick. It is inherently related to Francesco's penchant for sight, as our most critical and important sense.[40] At the end of a passage on gardens, Francesco reminds us that by adding more elements to the garden, the garden will be more delightful as "the more there will be variety, the more delighted the eye will be."[41]

A third purpose is for drawing to serve as the basis of invention. In a passage on Fortresses in T2, Francesco refers to the drawing and suggests that: "…departing from this [drawing], one can make many infinite and varied inventions according to the intelligence of those who apply themselves to such exercises."[42] Here Francesco is referring to his drawing as something that would initiate an imaginative process. This emphasizes the role of the drawing not as a fixed image that should be understood at face value, but rather as one that in turn will inspire the reader to start a new series of drawings in relation to the one (s) provided by Francesco.

In a statement in the chapter on Fortresses in T2, Francesco explains very clearly the intention behind his drawings. He states that: "In addition to all the general and specific rules, it is necessary for an ameliorated perfection and clarified information, to give examples in drawings." He argues that these examples will allow "a better judgment to the intellect and more resolution to the manner of building". Therefore Francesco argues that it is a common belief that "examples move the intellect more than common words, especially those who are less expert and erudite"[43]. This passage is selected from S, and Corrado Maltese suggest that in M, Francesco offers a very different and almost contrary opinion by stating that drawings "move enormously the expert men and the non-expert ones." Maltese suggests that this supposed contradiction might have been a result of Francesco sensing that what he is explaining through drawing at that moment would not otherwise

39 Ibid., T2, I Templi, 413. "Benché li candelieri non sieno parte del tempio ma accidentale ornamento, non è però superfluo, senza dichiarare per parole li ornamento loro, ponare diverse figure nel disegno e forme d'essi, delli quali ciascuno porrà eleggiare quella che piacesse."
40 The primacy of sight will be discussed in chapter three.
41 Ibid., T1, Campane, Campanili, Giardini, 246. "Anco di verdure et abori, tempi, laertini, logge, sedie, animali et altre fantasie ordenate seranno. E quanto le cose più varie, anto all'occhio più diletta."
42 Ibid., T2, Forme di Rocche e Fortezze, 444. "...come appare apresso disegnato; et a questi si può fare infinite e varie invenzioni sicondo la intelligenzia di quelli che in tali esercizi sono esercitati."
43 Ibid., T2, Forme di Rocche e Fortezze, 445. "Onde, oltre a tutte le generali e speziali regule [di sopra dichiarate del modo dello edificare le fortezze], è necessario a maggiore perfezione e chiara notizia ponere alcuni esempli di disegno, per li quali megli lo intelletto giudichi e con più feremezza ritenghi [el modo dello edificare], però che [comune opinione è che] li esempli più movno l'intelletto che le parole generali, massime quelli che non sono molto esperti et eruditi."

be comprehensible to all. However Maltese maintains that the ultimate sense of the whole argument is that in Francesco's opinion, drawings are clear enough to be understood by both experts and non-experts.

Similar to Francesco's *Trattati* Filarete's *dell'architettura*, composed as a fable, includes drawings juxtaposed with the text, and gives an essential role to drawing. Through story-telling, Filarete involves us in a narrative of building the ideal city of Sforzinda. The recurring theme of each episode is the act of *disegno* and its development in the shape of dialogues between Filarete, his patron Francesco Sforza, and his son Galeazzo Maria Sforza. As the story unfolds, the dual act of designing-drawing becomes a connecting theme that both symbolically and literally connects the narrative and architectural elements and allows us to follow the story. The recurring cycle of design, discussion, modification, and approval creates variety through each episode as well as continuity through the main plot. Filarete's choice to have the formal structure of the book revolve around the notion of *disegno* can be understood both as an intentional gesture to advance the cause of architecture and raise its rank among the arts and as the artist's natural inclination to recount the story through episodes shaped by *disegno*.

Filarete's concerns and attitude in incorporating *disegno* as the main ingredient of the fable-like story brings him closer to Francesco in some respects, since he gives the same level of attention to the act of design and drawing in writing his treatise. As well, he is as vocal as Francesco about the importance of drawing. Yet his drawings, unlike Francesco's, are much more easily labeled as illustrations. Depicting moments or episodes in the story, they are images that accompany the text and provide snapshots of the story at selected points.[44] To use the term 'finished images', or 'illustrations', begs a clarification: a drawing that is simply depicting an event, a story or a specific moment in a narrative is inherently related to the narrative and does not have an autonomous life on its own. This dependant relationship also affects the notion of time in the drawing, as its time is also bound to the time of the narrative. Hence an illustration completes and complements the text, yet does not allow for an interpretation or an active re-imagining of the subject of drawing itself.

Their penchant for using drawing as a primary medium of expression and exploration can be partly attributed to both writers' backgrounds in, and inclination toward, the figural arts. Nonetheless, it would not be imprudent to claim that the act of drawing received attention and a rise

44 Filarete uses some of his works in Milan and Rome as illustrations for the story, which give his drawings certain autonomy. In using the terms illustration, my emphasis is aimed at distinguishing between Filarete's drawings' inherent relationship to his story in comparison to Francesco's drawings that do not follow a plot, but manifest different ideas in a theoretical context.

in status thanks to Francesco's and Filarete's emphasis. The propagation of their treatises (both in manuscript format) within the circles of the Renaissance had an important impact. This, on its own, could have affected the dissemination of drawing as a more powerful means of expression. In her extensive survey on copies made from Francesco's original work, Scaglia has meticulously classified both full and partial copies of his *Trattati.*[45] The variety and quality of drawings change from codex to codex, and in turn open up doors for widely divergent understandings of the same subject matter. As an example, the drawings of the Zichy Codex,[46] are in high contrast to *Saluzzianus* codex, and do not have the same character.

The brief study of the nuances and subtleties between the different types of drawing books leads to the conclusion that amount of freedom taken by the author and ongoing inquiry were active factors influencing the form of different types of drawing books. It has been possible to qualify Francesco's foundational works such as the *Codicetto*, the *Opusculum*, and the *Monumenti antichi*, within the genre of Renaissance sketchbooks and model-books. But the *Trattati* are more elusive and harder to categorize in terms of previously existing types. While the *Trattati* bear some similarities to illuminated or illustrated works, they differ in two important ways. First, while drawings in the *Trattati* do refer to the specific contents of the text, they do not stop at merely mirroring the text: they sometimes surpass it. Secondly, in the case of the *Trattati,* there is a less of a ruptured or accidental relationship between text and drawing. That is to say, the margins of illuminations often challenged the authority of the text by presenting moments of disconnection or opposition. In contrast, in Francesco's work, text and drawing are to make sense together; therefore their relationship can be described as more structured than is the case in illuminated manuscripts. The *Trattati* presents a specific body of theory next to drawings. This makes for a new genre, one that we may call drawn-theory. The clear manifestation of Francesco's will in devising such a specific relationship between text and image in, so far only discussed in terms of format, merits to be investigated in terms of content and intentionality as well.

LINEAMENTI, DISEGNO AND *ARTE ANTEGRAPHICA*

Having considered differences in format among the works of Alberti, Filarete and Francesco, it is now appropriate to investigate the terms employed by each author regarding issues of drawing. Alberti's use of the Latin term *lineamenti*, Filarete's use of *disegno*, which is in turn broken down into

45 Scaglia, Checklist.
46 See chapter one, 20.

more precise terms *disegno di grosso*, *disegno proporzionale*, and *disegno rilevato*, and Francesco's use of *Arte antegrafica* and *disegno* are examined in the following passages.

The term *disegno* was widely used by architects, painters, and the artists of the Renaissance during the 15th century. Following examples from historical references which appear in *Tresoro della Lingua Italiana delle Origini* (TLIO),[47] the terms *desen, desengno, deseni, desiene, desinno, disegni, disegnio, disegno, disengni, disengno,* and *disegno* stem from the verb *designare*. They compare to the verb "designate" in English, bearing notions of specifying, indicating or characterizing some thing. Evidence suggests that different variations of *disegno* are found in texts of mid- to late-14th century in Italy[48]. Essentially TLIO offers three broad definitions for *disegno*, relating it to the three categories of: visual arts, architecture, and military planning.

The first definition of *disegno* is: ***Rappresentazione grafica di un'immagine, eseguita per fini decorativi***, which means a graphic representation of an image, executed for decorative purposes. To contextualize it, the two following instances are referred to:

> *"Che il desengno facto per li decti maestri e dipintori è più bello e più utile e forte per ongni ragione, che niun'altro. E questo difenderàno da chi il contradio dicesse, per chiare ragioni. Francescho Talenti capomaestro consigliò, che il desengno de' maestri e dipintori è più bello utile e più forte che niuno altro disengno."*[49]

> *"imperò che la prima Chiesa, che si chiamò sinagoga, fu terrena e fu tutta piena di figure e disegni e di cerimonie..."*[50]

In both cases, the terms *desengno*, *disengno*, and *disegni* refer to images implying a visual nature for the work in question. They therefore tie *disegno* to drawing and painting, aspects of the visual arts category introduced above. The fact that the word '*disegno*' is used here in tandem with *capo maestro* (master mason), *maestri* (masters) and *dipintori* (painters) is yet another indicator of the implicit connections of drawings to both architecture and painting. In the same category of visual arts, we are given yet another definition, this time related to geometry: ***[Geom.] Rappresentazione schematica di una figura geometrica***, a schematic representation of a geometric figure.

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47 TLIO stands for Tesoro della Lingua Italiana delle Origini, developed by the Opera del Vocabolario Italiano, a CNR institute based in Florence at the Accademia della Crusca. TLIO is accessible online at: http://tlio.ovi.cnr.it/TLIO/index.html. 01/04/2010.
48 Ibid., Disegno appears in Tuscan texts in: Fatti di Cesare, XIII ex. (sen.); Francesco da Buti, Purg., 1385/95 (pis.), and in Northern texts in Doc. ven., 1362 (3); Doc. venez., 1367. Its manifestation in Southern and central areas dates back to Buccio di Ranallo, Cronaca, c. 1362 (aquil.).
49 Ibid., Doc. fior., 1362-75, [1366] 150, 174.19.
50 Ibid., Francesco da Buti, Purg., 1385/95 (pis.), c. 29, 70-81, 707.26.

"E se tj foxxe data quest' altra ragione quj di sotto chom'è per disegno e per reghola vedraj..."[51]

Here the term *disegno* refers to the visual manifestation of a geometric figure. The abstract geometrical principles are rendered intelligible through the medium of drawing. Although the connection is more subtle, there is nonetheless a parallel to be made with the transfer of an abstract concept to a visible form. This notion of *disegno* is related to architectural practice, as the learning of geometry (specifically through the popular *Trattai dell' Abbaco*, handbooks of all things mathematical), was part of the early Renaissance cycle of learning for many artists and architects.[52]

The second definition of *disegno* belongs to the architecture category; it is defined as: ***[Arch.] Rappresentazione grafica di un progetto da eseguire***, which means graphic representation of a project to be executed. I believe here TLIO's definition falls short of tending to the function of a drawing or an idea preceding a project. The examples cited below prove that *disegno* does not only pertain to the execution of a project:

" E fecesi el disegnio di detta chiesa dove è ogi santo Pietro a Ville, e così si fece poi, quando fu chalonazzato."[53]

" al nome de Dio debiè andare a Stagno cum queste desiene a vui chomesse."[54]

" Et per la Magdalena quisto loco comensone / Et tutto lo desinno da llasù ci recone."[55]

"Per tuti questi deseni dé andar una via carira in ver Ponente dela Liuta, fina a 1 aqua de Smocovenaç ampla passi II."[56]

" I savi e discreti huomini hoperai sopradetti feciono richiedere gran numero di cittadini per avere dal loro chonsilglio, quale de' due disengni fatti e in forma di chiesa murati, chome detto è, più loro piace, e quale fosse da prendere, per bene e onore e mangnificenza de la detta chiesa di Santa Reparata e del chomune di Firenze."[57]

In the above examples, the first meaning of *disegno* in all the cases is strictly architectural; in the first case it accurately refers to the idea of design. In the second fragment, it indicates drawings to be submitted. In the third case we can interpret the text as: this room is designated for Magdalena, all

51 Ibid., Paolo dell'Abbaco, Trattato, a. 1374 (fior.), 54, 54.24.
52 Diane Finiello Zervas, "The Trattato dell'Abaco and Andrea Pisano's Design for the Florentine Baptistery Door", Renaissance Quarterly Vol. 28, No. 4, Studies in the Renaissance Issue (Winter 1975), 483-50 and Nicholas Adams, "The Life and Times of Pietro dell' Abaco, a Renaissance Estimator from Siena (active 1457-1486), Zeitschrift fur Kungstgeschichte, 48 Bd., H3(Munchen, Berlin: Deutscher Kunstverlag GmbH: 1985) 384-395.
53 TLIO., Cronaca sen. (1202-1362), c. 1362, 47.25.
54 Ibid., Doc. ven., 1362 (3), 203.12.
55 Ibid., Buccio di Ranallo, Cronaca, c. 1362 (aquil.), quart. 238, 50.
56 Ibid., Doc. venez., 1367, 334.14.
57 Ibid., Doc. fior., 1362-75, [1367] 190, 199.9.

the drawings of hers are gathered there; therefore the notion of designation, and thus paintings or drawings, is raised. The fourth instance refers to the location of the drawings and their geographical indication. The last instance, interestingly enough, indicates a process of selecting the design for the church of Santa Reparata in Florence. There, people have been invited to select the best designs from the scheme of the two walled churches.

A variation under the same category offers another meaning of *disegno*: ***Progetto di un'opera letteraria da eseguire o da completare***. This means the project of a literary work that is to be executed or completed. The following verses are given as an example to which such a definition applies.

> *"E ben che Venus col vago dissegno / mi fesse pronto già ad ogni verso, / oggi le tempie cane e 'l mondo avverso / m'han fatto de la penna esser indegno."*[58]

Here the dreamlike (*vago*) plan of Venus, which relates to a literary project, could also be interpreted as *disegno* pertaining strictly to the realm of thought and ideation instead of a material representation of an idea. I believe this is also relevant to the realm of architecture, as often understood in modern usage.

Finally, the third and final definitions for *disegno* indicate a strategic plan, whether an idea or a definitive plan to be executed. ***[Milit.] Piano strategico*** means a strategic plan as the following examples show:

> *Come gli Elvezî non lasciarono per la morte di Vergetorige il disegno d'impadronirsi di Francia...*[59]
>
> *Gli Aretini, sdegnati per le parole sue, perchè ogni loro disegno si rompeva, ordinavano di farlo uccidere...*[60]
>
> *E vene lo' fatto ogni loro disegnio, ché preseno nel contado di Lucha molte terre e nel contado di Pistoia e ancho nel contado di Pisa.*[61]

What becomes evident from the above-mentioned examples is that the term *disegno* had broad fields of application. All the above-mentioned uses correspond to the multidisciplinary nature of architecture during the Renaissance. In a range that varies from abstract ideas to strategic war plans, *disegno* integrates the entire field of activities in which Francesco and many other architects

58 Ibid., Sacchetti, Rime, XIV sm. (fior.), 259.5, 311.
59 Ibid., Fatti di Cesare, XIII ex. (sen.), Sal. L. 2, cap. 7 rubr., 51.6.
60 Ibid., Dino Compagni, Cronica, 1310-12 (fior.), L. 1.8, 137.8.
61 Ibid., Cronaca sen. (1202-1362), c. 1362, 51.38.

were active Although the aforementioned passages are not gathered with a particular sensibility for the term and its different connections to architecture during the Quattrocento, they can be used to extrapolate three different facets of *disegno*. Essentially, *disegno*'s first meaning pertains to a one-to-one relationship with an actual image, related to the realm of representation. *Disegno* can be understood as a drawing, either a figural or an architectural one. Second, in its clearest connection to architecture, *disegno* can be both a drawing that represents a project and the idea of a project, manifested in either a drawing or a model. In its literary sense, or in a military context, *disegno* can also be understood as a scheme, a project, or an intention that is tied to an actual work; however, such connections become more implicit rather than explicit, because they are not representations of ideas but ideations of a concept or project.

Going back to the three *trattatiste*, it is appropriate to follow a chronological order and start with Alberti, continue with Filarete, and end with Francesco. Alberti begins *De Re Aedificatoria* with a description of the meaning and function of *lineamenti*. Alberti's use of the term *lineamenti*, has been translated as "lineaments" by Joseph Rykwert. The use of the term *lineamenti* is significant; referring explicitly to lines and their placement, it targets the essence of the act of drawing that is manifested through points, lines, and surfaces. In the specific context of our discussion, however, the Italian translation of Cosimo Bartoli who replaced *lineamenti* with *disegno* in his translation of Alberti's work from Latin in the 1550's is also relevant. James Leoni, who then translated Alberti's work into English from Bartoli's Italian, used the word design as the equivalent of *disegno*. This replacement is historically important. By using *disegno* instead of *lineamenti*, the first sentence of Alberti's treatise could be read as: "architecture is composed of drawing (instead of Design) and structure." My aim is to demonstrate that the change of the word matters because it effectively modifies Alberti's meaning. In fact Bartoli's translation of *lineamenti* as *disegno* is influenced by Filarete's and specifically Francesco's contribution: the emphasis on drawing as central to architectural discipline. I do believe that Rykwert's decision to stay with lineaments is more appropriate, because the abstractness of *lineamenti*, as I will demonstrate, is more consistent with Alberti's idea of design than that associated with visual arts and emanating from Francesco and Filarete's theories.

James Leoni's translation reads: "…the whole art of Building consists in the Design and in the Structure. The whole Force and Rule of the Design, consists in a right and exact adapting and joining together the Lines and Angles which compose and form the Face of the building."[62] This is to be compared with Rykwert's translation which reads as "…The whole matter of building is

62 Alberti, Art of Building, Leoni Edition, Book I, Chapter 1, 1.

composed of lineaments and structure. All intent and purpose of lineaments lie in finding the correct, infallible way of joining and fitting together those lines and angles which define and enclose the surfaces of the building."[63] Alberti continues by describing the function of lineaments as "to prescribe an appropriate place, exact numbers, a proper scale, and a graceful order for whole buildings and for each of their constituent parts, so that the whole form and appearance of the building may depend on the lineaments alone."[64] He emphasizes that the lineaments are immaterial and can be found in many different edifices. Alberti claims that "It is quite possible to project whole forms in the mind without any recourse to the material, by designating and determining a fixed orientation and conjunction for the various lines and angles. Since that is the case, let lineaments be the precise and correct outline, conceived in the mind, made up of lines and angles, and preferred in the learned intellect and imagination."[65]

Alberti's clarity in conferring an abstract existence to *lineamenti* as an autonomous phenomenon shaped and conceived in the mind is paramount in this passage. That an idea can be shaped in the mind certainly forms the first step of every design process. However, here Alberti unequivocally emphasizes a perfect, complete, and almost magical appearance of the *lineamenti* in the mind. He accentuates the mental or abstract nature of it by associating it with the intellect and imagination. To be more explicit, following this passage one would almost expect to have the design of a project be born in an already finished form in the mind[66]. It is as if the drawing of a project were to emerge from one's mind manifesting the building's geometric essence and not as a document bearing the traces of an iterative process. As will be demonstrated below, this notion is to be taken as a critical distinctive element that separates Alberti's position from that of his counterparts. Perhaps in relation to this discussion, it would be worthwhile to refer to a drawing attributed to Alberti.[67] In his drawing of the Baths, we are not faced by a typical plan drawing. We can assert that the drawing establishes a series of proportions and relationships bordering on a geometrical representation which is close to Alberti's notion of *lineamenti*.[68]

The notion of *compartitio* is coupled with *lineamenti* and closely linked by Alberti to the idea of conception; it "alone divides up the whole building into the parts by which it is articulated, and

63 Alberti, Art of Building, Rykwert Edition, Book 1, Chapter I, 7.
64 Ibid.
65 Ibid.
66 In our contemporary language, one can liken the process Alberti explains as the coming about of a plotted page out of one's mind, ready to be implemented as is and built into the wooden model.
67 The drawing is amply discussed in Howard Burns, "A Drawing by L. B. Alberti" Architectural Design Profile 21: Leon Battista Alberti Architectural Design XLIX (1979): 5-6.
68 This is interesting, as Alberti's drawing, is not dissimilar to some of Francesco's drawings in T2, which have similar attributes.

integrates its every part by composing all the lines and angles into a single, harmonious work that respects utility, dignity, and delight."[69] In tandem with these notions, one should also refer to the notions of beauty and ornament, specifically when Alberti elaborates on two kinds of pleasure derived from objects of beauty and ornament. Beauty for Alberti is "the reasoned harmony of all parts." Once again we find that Alberti's notion of beauty resonates with the abstract nature of the *lineamenti*, as ultimately it is rooted in a precisely calculated harmony, from which one could neither add nor subtract. Alberti differentiates between the pleasure that is derived from objects of great beauty and the pleasure that is produced "either by invention and the working of the intellect, or by the hand of the craftsman, or … is imbued naturally in the objects themselves."[70] Alberti clarifies that the intellect is responsible for "choice, distribution, arrangement"[71] which will result in the work's dignity. The hand will be responsible for "laying, joining, cutting, trimming, polishing"[72] therefore allowing the work to have grace. Ultimately, Nature will provide the work with "weight, lightness, density, purity, durability"[73] which will bring the work admiration. Alberti confirms that dignity, grace and admiration should be applied to each and every part of the building.

As we can see in the above passage, Alberti makes a clear distinction between natural objects and man-made objects. Along with admiring the beauty of natural objects, we will be able to marvel at two different sources for man-made beauties – that of the cerebral and that of the manual. Here, Alberti dissects the responsibilities of the hand and the mind. While the hand makes for the material beauties, the mind is at work to give the work its inherent dignity, achieved by *compartitio*, positioning, and *lineamenti*. Alberti's palpable preference for the beauties conceived in the mind, versus ones that emanate from craftsmanship is not dissimilar to Lucian's distinction; his attitude definitely places him in the rank of those who clearly gave superiority to the idea of a work, rather than the work itself. The mention of invention is also critical to us, as Francesco's articulation of the same theme will be discussed later[74].

In Alberti's *De Re Aedificatoria* one comes across the two main phases of the design process: the conception of the idea in the mind, which is a precise and cerebral activity, and the tangible and accessible design in the format of models. For Alberti, drawings seem to be located somewhere between these two extremes. Without dwelling on them extensively, he hints at the discrepancies

69 Alberti, Art of Building, Rykwert Edition, Book One, Chapter II, 27.
70 Ibid. Book Six, Chapter IV, 159.
71 Ibid.
72 Ibid.
73 Ibid.
74 Chapter three expands on invention at length, see the part on invention from 92.

between the idea, the sketch, the scaled drawing, and ultimately his favored mode of study and representation, i.e. the model. Drawing does not seem to be at the forefront of his preoccupation in his book on building; nonetheless, he expresses his preference for projection, as opposed to painterly means of representation. In his book on architecture, he manages to stay as distant as possible from delving deep into the notion of drawing.

The following passage is one of the rare instances in which Alberti expands on the theme of architectural drawings as opposed to painterly drawings. Not surprisingly, once again the discussion initiates with the issue of models, before culminating in drawings: "The presentation of models that have been colored and lewdly dressed with the allurement of painting is the mark of no architect intent on conveying the facts, rather it is a conceited one, striving to attract and seduce the eye of the beholder, and to divert his attention from a proper examination of the parts to be considered, toward admiration of himself. Better then that the models are not accurately finished, refined and highly decorated, but plain and simple, so that they demonstrate the ingenuity of him who conceived the idea, and not the skill of the one that fabricated the model. The difference between the drawings of the painter and those of the architect is this: the former takes pains to emphasize the relief of objects in paintings and diminishing lines and angles; the architect rejects shading, but takes his projections from the ground plan, and, without altering the lines and by maintaining the true angles, reveals the extent and shape of each elevation and side – he is the one who desires his work to be judged not by deceptive appearances, but by certain calculated standards. It is advisable then to construct models of this kind, and to inspect and re-examine them time and time again, both on your own and with others…"[75]

Alberti categorically distinguishes between the practices of painting and architecture by pin-pointing their major means of communication and how this is handled in each field. In elaborating on the differences between drawing in panting and architecture Alberti calls for a sobriety and lack of ornament that will allow reading the architectural ideas without any visual encumbrance. While one can simply deduce that Alberti discredits the practice of painterly drawing in comparison to his preferred architectural drawing, a more subtle understanding of the above-mentioned differentiation is possible. One hypothesis is that Alberti's own way of practice, stemming from his learned and writing-oriented background, could be the major impetus behind such a categorization. Another hypothesis can relate his qualification to the connection between the concept and the audience; certainly the examination of a model would be more comprehensible and immediate for the patrons

75 Alberti, Art of Building, Rykwert Edition, Book 2, Chapter I, 33.

than would be their apprehension of a drawing.[76] It seems that in Alberti's eyes, drawings are nonetheless part of the process, as he refers to plans and elevations (as Rykwert has translated those terms).

In the two following passages we once again are faced with a mention of models and their different parts. Alberti advises us to examine "the design of your whole building through the various parts of your model, until there remains nothing that has escaped your attention and observation."[77] Only then is one allowed to make the necessary steps for the execution of the project In another instance, Alberti advises again: "Using scale models, reexamine every part of your proposal two, three, four, seven – up to ten times, taking breaks in between, until from the very roots to the uppermost tiles there is nothing, concealed or open, large or small, for which, you have not thought out, resolved, and determined, thoroughly and at length, the most handsome and effective position, order, and number."[79] While in the earlier example, he only talks about a model, the second one is even more explicit as it requires scale models, therefore more than one model. Most probably models at different scales would be necessary to examine and reevaluate the design.

In Filarete's book, *disegno* appears in two variations: first in a discussion between the architect and the patron that leads to a drawing, and then in the reverse process through which Filarete first makes the drawing and then discusses it with his patron. While making architecture through the active involvement of the learned and willing patron and the architect might be a partially idealized version of the reality, nevertheless Filarete's stories offer many insights into the thought process and the practice of architecture in his time. Of interest to us are the subtleties associated with the two processes. In some instances, the architect presents an already-made drawing which is then discussed, understood, approved, or modified as the main idea, with the patron exercising his option of making alterations. In other instances it is the patron who has a specific idea that should be translated into drawing by the architect's hand. Of essence is the ever-constant pattern that for an idea to be thoroughly understood, discussed, or approved a drawing is needed. As Filarete claims, "it is impossible to explain clearly this business of building if it is not seen in a drawing. It is even difficult to understand it in a drawing. Anyone who does not understand drawing cannot understand it well, for it is more difficult to understand a drawing than to draw it."[80] A perplexed Filarete then goes on

76 Millon, Brunelleschi to Michelangelo, 19-74.
77 Alberti, Art of Building, Rykwert Edition, Book Two, Chapter II, 37.
79 Ibid., Book Nine, Chapter VIII, 313.
80 Filarete, Filarete's Treatise on Architecture. Facsimile and Translation by J. Spencer (New Haven: Yale University Press, 1965), fol. 40r. Citations from the Italian version would be from: Filarete, *Trattato di*

to criticize those who have drawing but lack insight, thereby pointing at the importance of having both insight and ability in order to perform as an architect. Filarete's fabulous process of architectural conception is also crucial. In Filarete's view, to conceive a building involves both the architect, as the mother, and the patron as the father, and takes seven to nine months, during which the architect should "*fantasticare e pensare e rivoltarselo per la memoria.*"[81] As Kemp has noted,[82] Filarete's coupling of *fantasticare-pensare*, a recurring theme in his book, demonstrates that he understands fantasy as an imaginative formation that complements and extends rationality.

In this light, it seems natural for Filarete to choose drawing as the main mode in giving birth to his conception. His idea of an imaginative process resembles Alberti's, yet its fantasy component allows for a much more malleable and supple process, more in tune with the instantaneous and fluid nature of drawing than that of model-making. Filarete's many allusions to the discrepancy between the idea and the drawing, the drawing and the scaled drawing, and finally the model, demonstrate his allowance for a maturing process, similar to Alberti, yet mainly articulated through the doing and re-doing of drawing. Filarete's background in the figural arts might partly explain his penchant for the spontaneous act of drawing in which the movement of the hand, stimulated by the imagination, allows for the ideal city to slowly take shape through harmonious dialogues between the architect and the patron. Filarete sums up his design process for us in a few telling sentences: "I have already conceived this city with my lord and have examined it many, many times with him. Thought about it myself, and decided on it with him. Then I gave birth to it, that is I made a line drawing of it for him [showing] the foundations, and he was pleased. Before beginning I told him what would be needed. While I struggle to make ready everything necessary for its foundations, I shall make the aforementioned model, or three-dimensional design."[83]

Now let us dwell on Francesco and his use of the term *arte antigrafica*. According to Maltese, the term *antigrafica*, a common misspelling for the *antegraphicem*, should be understood as *arti del disegno*, or the arts of design, as a part of a "general campaign in favor of the emancipation of one's

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Architettura, Introduction and Notes by Liliana Grssi, (Milan: Polifilo, 1972) and will be referred to as the Grassi Edition.

81 Ibid., fol. 7 v, 15.

82 Martin Kemp, "From 'Mimesis' to 'Fantasia': The Quattrocento Vocabulary of Creation, Inspiration and Genius in the Visual Arts", Viator Medieval and Renaissance Studies Vol. 8, (1977): 347-398. 365.

83 Filarete, On Architecture, Spencer Edition, Book 2, 22. and Filarete, L'architettura, Grassi Edition: Libro Secondo, 53. "|…f. 11 r|…io ho già generate questa città col mio Signore, e insieme collui l'ho esaminata più e più volte, e da me pensata e collui diterminata. E poi io l'ho partorita, cioè glie n'ho fatto uno disegno in liniamento secondo che vanno i fondamenti. Ègli piaciuto, ma innanzi si cominci io gli ho detto che bisogna; sì che io, in mentre si pena a' apparecchiare queste cose opportune per lo fundamento d'essa, farò il sopradetto modello, o vuoi dire disegno rilevato..."

own profession conducted by all the major Renaissance artists."[84] While in the *Trattati*, *disegno* is used frequently, Francesco's insistence on using the more encompassing term *arte antigrafica* could be partly due to his background in the visual arts, and partly in response to his intellectual aspirations for the architectural profession. While he identifies the art of architecture as belonging to the domain of *arte antigrafica*, he does not further elaborate on its other components.

In his chapter on temples[85], Francesco names *ingegno* and *invenzione* as the most crucial qualities essential for an architect. In his book on the Renaissance[86], David Summers describes the meaning of *ingegno* as "talent, the natural gift of a person"[87], and defines it as opposite to one's learning from art and experience. I propose the term "creativity" as it embodies the notion of an innate talent, and yet corresponds to a specific talent that would pertain to artistic fields, therefore closer to current language in relation to architecture. For *invenzione*, I believe "invention" is a fair rendition of the term. Francesco also calls architecture a subtle form of imagination conceived in the mind and manifest in the work. Of interest to us is his desire to associate imagination, an abstract and immaterial entity, with the work, a material body. Francesco continues by stating that creativity and invention are activities that should be sought after in the mind rather than seeking them in drawing (*disegno*) and writing, emphasizing once more one's innate gifts as the ultimate force behind architectural creation. Nonetheless, he immediately points to the fact that the architect has to have a good memory and should have been exposed to many examples. Francesco warns that "many things happen in which the architect is involved without actually ever thinking about them"[88] therefore he claims the architect ought to be "practical and knowledgeable, and to have good memory skills"[89].

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84 Di Giorgio, Trattati, T2, 293, 293 (4) by Maltese.

85 Ibid., T1, Templi, 36-37. "|....|Avendo detto delle formazioni della città e fortezze marittime e paludose, da dire pare de'pubrichi e privati edifizi: sì eziandio de'palazzi ed anco delle case de'particulari citadini. I tempi sacri da fare sono di più varie e diverse forme sicondo la invenzione, sottilità, ingegno e ragione dell'archtietto, sepmre osservando le misure e proporzioni a essi appartenenti, le quali dal corpo umano tutte tratte sono. Ma se l'architettore non ha perspicace e singulare ingegno e invenzione, none aspetti mai perfettamente tale arte esercitar potere, imperò che l'architettura è solo un sottile imaginazione concetta in nella mente la quale in nell'opera si manifesta. Anco è da notare che l'ogni e ciascuna cosa non si può la ragione assegnare, perché lo ingegno consiste più in nella mente e in nello intelletto dell'architettore che in iscrittura eo disegno, e molte cose accade in fatto le quali architetto overo opratore mai pensò. E imperò bisogna che esso architettore sia pratico e sciente, memorioso e che abbi letto e veduto molte cose all acosa che segue {alle eventualità che si possano presentare ulteriormente} essare preparato. E non siccome molti arroganti e presentuosi i quali nelli errori fondati sono e per forza della lingnia{lingua} loro el falso dimonstrado el mondo hanno corotto. E per volere in parte {per volere argomento per argomento} le ragioni d'essa architettura sicome seguirà {in L brevemente}discriverò."

86 David Summers, The judgment of Sense, Renaissance Naturalism ad the Rise of Aesthetics, Series: Ideas in Context, (Cambridge: Cambridge University press, 1987).

87 Ibid., 99. Summers defines the term as an innate quality. He explains that for Avicenna, *ingenium* is the place where "material and agent intellect" coalesce.

88 Di Giorgio, Trattati, T1, Templi, 36.

89 Ibid.

Francesco believes that the architect should have read and seen many things, once again emphasizing a pairing of reading theory and first hand observation – a pattern he observed faithfully. The combination of innate gifts and acquired abilities will prepare one for the unexpected things that might befall one following the architect's path.

On what concerns the abilities and requirements an architect must possess, Francesco calls drawing the first skill to be acquired by architects. In his opinion, *disegno* is always paired with the sense of sight and the act of seeing, which sets the tone and guides one through *disegno.* In T2, in the chapter on fortresses,[90] Francesco once again states that for the readers of his *Trattati* it would be "very useful and almost necessary for the architect, or whoever wants to take any advantages of this little work of mine, to have some drawing (*disegno*) skills, since without them it is impossible to understand well architectural composition." But immediately after, he adds that even the text and drawings provided by his book would not enable one to become an architect, as there is a need for invention, which he argues "is necessary to the perfection of the arts". Therefore he calls on the readers' innate ability to make sense of his work and find their way into the practice of architecture. Francesco further explains that many can conceive in their minds, yet fall short of demonstrating their thoughts either to themselves or others by means of design. This argument leads to the conclusion that although abstract invention and designing in the mind are superior activities, they would have no value if they cannot be translated into the communicable medium of drawing. Therefore for the architects to examine things on their own or share their ideas with others, drawings are an absolute necessity.

One of the most revealing passages in *Trattati,* which expands on such subjects and contrasts Francesco's position on drawing to that of Alberti, is one that comes late in T2 [91] and, as Maltese has

90 Ibid., T2, Forme di Rocche e Fortezze, 482-484 and 483 (4). "|…S 42|Terzo, saria molto utile, e quasi necessario che l'architetto,overo chi vole pigliare frutto alcuno da questa mia piccola opera, intendesse qualche poco di disegno, peroché senza quelo non si può bene intendere le composizioni delle parti dell'architettura, et oltre a questo perché questa arte, oltre a la scienzia et intelligenzia acquista da libri e disegni, ha di bisogno di invenzione, senza la quale non è possibile essere bono architetto, perché molto cose, non potendosi descrivere né insegnare, bisogna restino nella discrezione e giudizio dell'artefice. ... Ultimamente, perché come ho ditto la invenzione è necessaria a perfezione dell'arte, molti, avendo in la mente fabbricato un edificio con le sue conveniento proporzioni, non possono poi mettarlo in opera, non sapendolo né a sé né ad altri col disegno dimostrare. E queste condizioni osservando non serà difficile a ciascuno operare ragionevolmente."

91 Ibid., T2, Parti e Forme di Porti, 489-90. "|…M 88| Sono per molti tempi stati dignissimi autori I quail hanno diffusamente descritto dell'arte dell'architettura e di molti edifizi e machine, quelli con carattare e lettare dimostrando e non per figurato deisegno, et in talli modi hanno esplicato li concetti della mente loro; e per benché ad essi compositori li paia molto largamente tale opare sicondo la mente loro avere illucidate, pure noi vediamo che sono rari quelli lettori che per non avere disegno intendare possino. In però che andando drieto alla immaginativa, ciascuno fa varie composizioni che sono tal volta più differente dal vero e da la prima |M88v| intenzione che dalla chiara luce la tenebrosa notte, e per questo reca ai lettori non piccola confisione {confusione}, perché, siccome è ditto, tanti lettori, tanti varii compositori. Ma quando tali autori concordassero

noted[92], might be due to Francesco's exposure to Alberti's work and meant as a direct reaction to it. Francesco starts his argument by referring to the fact that for the longest time, excellent authors had explained architecture, buildings and machines, with "characters and letters" and not by "drawn figures". He continues that they have in this fashion explained ideas they had in mind, yet "rare are the readers who can understand the contents of these descriptions without the help of drawings." By focusing on the readers' reaction, Francesco describes that the process of reading about others' thoughts, which is followed by readers imagining them in their mind, will make it so that "everyone makes various compositions that are as different from the truth or the original intention as daylight is from the darkness of the night." Francesco claims that distanciation and confusion from the original thought is problematic as "there are as many readers as writers." This will eventually result in a multitude of interpretations, some far and some close the original intent of the writer.

However Francesco offers the solution to this dilemma by claiming that "if these authors combined writing and drawing (*disegno)*, it would be much easier to judge the work of these theoretical thinkers." Francesco points to the obscurity of these authors, due to the "lack of drawings, since it is clear that many of these authors have knowledge (*dottrina*) but lack creativity (*ingegno*), and others who have creativity (*ingegno*) but no knowledge, and yet others who have both but lack the ability to draw (*disegno*)". Therefore Francesco says that those who cannot draw have to rely on an expert painter's (*pittore*) help so that they can demonstrate things in drawing (*disegno*) rather than in writing. Francesco then points to the difficulty for an author or an inventor to "imprint what he clearly sees in his intellect in the minds of others." Aside from the content, Francesco's use of words is apt as he uses the word imprinting, which in turn is connected to drawing.

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con la scrittura del disegno, molto più apertamente si porrebbe iudicare vedendo molti speculativi ingegni che per loro solerzia hanno molte cose invente e dell'arte antiche come di nuovo ritrovate quelle descrivendo {hanno inventato molte cose e ne hanno riscoperte altre appartenenti all'antichità descrivendole.}, e per non avere el disegno sono difficilissime ad intendare, perché siccome noi veddiano sono molti che hanno la dottrina e non hanno l'ingegno, e molti dotati d'ingegno e non di dottrina, e molti hanno la dottrina e lo ingegno e non hanno el disegno. Onde Conviene, se questi vogliono per disegno altre scritture alcune cose dmostrare, bisogno che ad uno esperto pittore lo dia ad intendare {Per cui si presenta loro la necessità (bisogno:errore per bisogna) di affidarsi a un esperto pittore se vogliono dimostrare qualcosa con disegni oltre(per errore altre) che con scritture} Ma <è> difficilissimo e gran penura {penuria, nel significato di pena, difficolta} <h>a lo autore overo inventore imprimare nella mente d'altri quello che lui manifesto coll'intelletto apartamente vede, e massime per dimostrate ad un medesimo tempo le cose estrinseche e intrinseche e anco delle occulte, come sarebbe il fondare in mare o in alcuna latra profundità di acque e non per via di prospettiva e rette linee o natural disegno, ma per una certa via indiretta o d'alcune nuove e insusitate invenzioni, la quale ingegno umano non porria per alcun modo insegnare; e per questo credo molte opere si sieno perse e ritardate, siccome manifesta esperienzia veggio in questa mia operretta essarmi stato forza molte tralassare; adunque iudico el disegno essare in questo necessario a qualunque altra scienzia si sia."

92 Ibid., 489 (1) by Maltese.

Francesco continues by stating that the biggest challenge is to "demonstrate the extrinsic, intrinsic and the occult things all at the same time", which he qualifies as being as impossible "…as it would be to lay foundations in the sea or in any other deep body of water, not through perspective (*prospettiva*) and straight lines (*rette linee*) or natural drawing (natural *disegno* – most probably referring to orthographic drawing), but using a certain indirect way or any other new and unusual inventions, which human creativity (*ingegno)* could not teach in any way". For this purpose, Francesco claims that many works have been delayed and much has been left out, including his own work, and therefore he concludes by reiterating that he considers "drawing (*disegno)* to be necessary to any other science."

Here Francesco clearly states that for the process of architectural thinking and projection to be complete, the transfer from mind to drawn form is a crucial part of the process, which otherwise leaves the process unfinished and the invention unfulfilled. Another preoccupation, which one could sense by reading this chapter, is Francesco's concern for the reception and understanding of the work. Here we are faced with a two-fold concern, as he is on one hand using, and reaching to understand, other people's work; and on the other he is preoccupied by the reception of his own work. Therefore we have Francesco, as reader and as writer, pointing to one essential element that he identifies as the absolute necessity in understanding architectural thought: the act of drawing.

DRAWING IN RELATION TO THE ARCHITECT'S EDUCATION AND PRACTICE

While enumerating the abilities one needs to qualify as an architect, Alberti states that the most successful architect is the one who has "a good sense of what is appropriate."[93] He adds that the difference between a craftsman and the architect is that while the craftsman can make something that is convenient for use, it is the domain of the architect's abilities "to preconceive and to determine in the mind and with judgment something that will be perfect and complete in its every part…"[94] Therefore not only can the architect conceive or design, but he can – and should – also judge the value of his work. Once again Alberti relates the design process to the realm of thinking, analysis and judgment. Further along, he likens the approach in the study of architecture to the study of letters: when studying examples of successful work, the architect will have to cover the whole range of recording that work in drawing and models. Therefore Alberti advises the young architect to look for

93 Alberti, Art of Building, Rykwert Edition, Book Nine, Chapter 10, 315.
94 Ibid.

works that have gained general approval and "…inspect it with great care, record it in drawing, note its numbers, and construct models and examples of it…"[95]

Alberti suggests that the arts essential to the architect are painting and mathematics – *Pittura* and *Matematica* in Bartoli's translation[96]. Alberti then refers to the irregularities, discrepancies and mistakes that happen through his own work process in the different phases of transferring his ideas to different modes of representation, from the conception of the idea in the mind to the final model that represents the project. Here is the passage in its entirety: "I have often conceived of projects in the mind that seemed quite commendable at time; but when I translated them into drawings, I found several errors in the very parts that delighted me the most, and quite serious ones; again, when I return to drawings, and measure the dimensions, I recognize and lament my carelessness; finally, when I pass from drawings to the model, I sometimes notice further mistakes in the individual parts, even over number."[97] I have included Leoni's translation of the same passage in the footnote[98]. In the same passage, Bartoli has employed: '*designate con linee'* and '*haeeua messo in disegno*'[99]. I believe here the first instance, the '*designate con linee'*, is neither as Rykwert has made it out in his translation nor as Leoni has interpreted it, reducing the notion to "drawings". I propose the translation of this phrase as "to designate with lines", so that one captures the idea in the mind and designates it in lines. In the second instance, '*messo in disegno'*, similar to the French '*mettre en dessin'*, literally means to put in drawn form.

This significant passage clearly shows that in Alberti's mind there is a perpetual distance that exists between an idea, its representation, and the necessary adjustments that need to be made. It is as if every phase of transfer brings about yet another unwanted degree of alienation from the abstract idea. The process described here much resembles that one penned by Filarete, which will be discussed shortly. Pérez-Gómez and Pelletier demonstrate that for Filarete the many transfers in the process of a project's maturation offer an opportunity for growth and improvement rather than an alienation and removal. Related to this point, one might propose a second hypothesis that Alberti's

95 Alberti, Art of Building, Leoni Edition, Book IX, Chapter X, 206. In Leoni's translation, the segment reads as "…to take them in Lines and Numbers, nay, make designs and Models of them…" Here I believe Rykwert's translation of drawing is more appropriate than designs. Therefore here we are facing the meaning of *disegno* as drawing, and not as design.
96 Alberti, Art of Building, Bartoli Edition, Libro Nono, Cap. X, 356.
97 Alberti, Art of Building, Rykwert Edition, Book Nine, Chapter 10, 317.
98 Alberti, Art of Building, Leoni Edition, Book IX, Chapter X, 207. Leoni's translation of the same passage reads as: "I have often started in my Mind Ideas of Buildings, which have given me wonderful Delight: Wherein when I have come to reduce them into Lines, I have found in those very Parts which most pleased me, many gross Errors that required Correction; and upon a second Review of such a Draught, and measuring every parts by Numbers, I have been sensible and ashamed of my own Inaccuracy."
99 Alberti, Art of Building, Bartoli Edition, Libro Nono, Cap. X, 356-357.

frustration is an outcome of his relationship to drawing.[100] Alberti's background as a scholar naturally inclined him towards writing as his main medium. In contrast to the humanist Alberti, the discrepancies between phases typical of an iterative process that changes medium would be more 'natural' to an artist trained in figural arts, such as Filarete or Francesco. The ease with which one draws and the distance that Alberti describes depends as much on one's ability to visualize, as it does on one's mastering of drawing and model making. What Alberti reads as discontinuity, Filarete interprets as a process of maturation.

Returning to painting, arithmetic, and geometry, Alberti emphasizes the importance of each for the architect. He clarifies that the architect's knowledge of each of these fields does not require the architect to excel in them, but to have an ability to practice them: "For all this I would not expect him to be a Zeuxius in his painting, or a Nichomachus in arithmetic, or an Archimedes in geometry. Let it be enough that he has a grasp of those elements of painting… sufficient knowledge in mathematics and considered application in angles, numbers and lines."[101] The importance of painting – and not drawing as an autonomous field as is closer to our contemporary understanding – is not to be undermined. It is clear in this passage, that similar to mathematics or geometry, painting is a field in which an architect has to have a hand. Yet as such, painting is a separate field; the ability one would attain in it would be applied – and not directly transferred – into the architect's practice.

Once again we are reminded that in order to be good at architecture one needs to be good at painting or drawing. However it is worth remembering that for Alberti painting is essentially *perspectiva artificialis* and *istoria*, and at its root has a different nature than the act of drawing. Although Alberti's opinion differs from both Francesco and Filarete in that he pairs painting with geometry, nonetheless his opinion is articulated in a way that associates the hand and the mind in a union on more than one occasion. Yet there seems to be a tendency in Alberti to favour cerebral activity in this constant pairing. Once again, Alberti's vocation as a humanist and his preferred medium, writing, might be behind such a preference.

On another occasion, while expanding on the appearance of models, Alberti distinguishes between painting and architecture. He does this mainly by associating orthographic projection with architects and *perspectiva artificialis* with painters. In his words, "The difference between the drawings of the painter and those of the architect is this: the former takes pains to emphasize the relief of

100 Pérez-Gómez and Pelletier refer to Filarete's passage in his treatise, in which he cherishes the changes between the phases as "similar to the changes observed in the living world of nature, analogous to alchemical transmutations and not to mathematical transformations." Pérez-Gómez and Pelletier, Perspective Hinge, 29.
101 Alberti, Art of Building, Rykwert Edition, Book Nine, Chapter 10, 317.

objects in painting with shading and diminishing lines and angles; the architect rejects shading, but takes his projection from the ground plan and, without altering the lines and by maintaining the true angles; reveals the extent and shape of each elevation and side. He is the one who desires his work to be judged not by deceptive appearances but according to certain calculated standards."[102] Therefore Alberti advises the architect to construct unadorned models and examine them attentively, alone and with others, so that the "identity, nature, likely position and size and prospective use"[103] of the project are all covered through the act of model making. In referring to this passage, Perez-Gomez and Pelletier make two points: one is that the existence of such models does not necessitate the pre-existence of coordinated plan/section/elevation drawings; and second is that this particular type of model is to be understood as a design tool for Alberti. While it is true that looking at a model is generally easier than reading a drawing for anyone who does not have a background in architecture, they rightly argue that Alberti's remark is intended to reject the argument that models were meant to be used only for patrons and not architects.[104] Alberti emphasizes models as a specific design tool which will allow examining and putting together the geometric *lineamenti* as well as the volume of the building. It is good to keep in mind that although Alberti never bestowed a similar tribute upon drawing as the main vehicle for thinking through an architectural project, and insisted on the authority of models to represent fully a project at first glance, he provided the first official written account of perspective in *De Pictura*,[105] and combined drawing, geometry, and mathematics in order to establish a map of the ancient buildings of Rome in his *Descriptio Urbis Romae.*[106]

In *Dell'Architettura*, the young prince's interest in architecture offers an insight into Filarete's ideas about drawing. Before delving deeper into his words, it is important to recognize Filarete's nuanced distinction of the relationships between drawing and design in the architectural sense and drawing and design as they pertain to painting. This nuance is certainly not an outcome of a slippage or a mistake. Rather, it is a sign that for Filarete the spheres of design and painting have so much overlap that often distinctions are blurred. Architectural drawings do not start where painting abilities end. Filarete's elaborations in the passage in which he instructs the young prince interested in architecture, as well as his ideas on perspective and drawing in general, thoroughly demonstrate these overlaps.

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102 Ibid., Rykwert Edition, Book two, Chapter 1, 34.
103 Ibid.
104 The essence of their discussion gravitates around the subject of perspective. See Pérez-Gómez and Pelletier, Perspective Hinge, 27.
105 Leon Battista Alberti, On Painting and on Sculpture: The Latin Texts of De Pictura and De Statua, Edited and translated by Cecil Grayson (London: Phaidon, 1972)
106 Leon Batista Alberti, Descriptio Urbis Romae, ou comment faire le portrait de Rome/ Alberti et Raphaël. Introduction et traduction Bruno Queysanne (Lyon: Plan Fixe; Grenoble: Ecole d'architecture de Grenoble, 2000).

In response to the young prince's request to be taught to draw, Filarete first briefly orates in praise of the act of drawing, in a similar manner to Francesco. He reassures the prince that there are many delights as a reward for the hardship of learning the art. Filarete reminds the prince that: "everything that is done by hand partakes of drawing. It is not shameful, because as I have said before, it is an unknown and little appreciated science. It was not this way in antiquity, because very great lords wanted to know this science….You would do very well to learn it, for it would acquaint you with a thousand delights."[107]

The dialogue between Filarete and the young prince follows, as Filarete argues to the prince that learning drawing will provide him with an ease of understanding architecture which would be otherwise impossible to obtain. Then in order to make the prince understand things, Filarete offers to draw: "So that you can understand them clearly, I will draw the form and ornaments of a few for you, as they are invented and used by the ancients. I will help you only with the drawing here; then you can do it and understand it by yourself."[108] This is one instance in which Filarete clearly demonstrates that one should apply oneself to drawing, as explication and understanding of the drawn medium are bound to happen as one draws. When the prince joyfully expresses interest in drawing architectural elements such as columns, Filarete wisely advises him to learn how to draw the human figure first, as the body is the cornerstone for learning drawing, and also for understanding architectural elements such as columns. In the following passage Filarete explains that drawing the figure is a necessary step "because all measures and proportions of columns and other things are contained in it. So that you can remember these measures well, and draw them without difficulty whenever you want to, you must write them down efficiently and keep a record of them, as you have done [already] with the other measures."[109]

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107 Filarete, On Architecture, Spencer Edition, Book Seven, 82. In Grassi Edition, Libro Settimo, 182-183. "|…f.47r|Avisandovi che ogni cosa che si fa di mano consiste nel disegno e non è vergogna, perchè come ho ditto innanzi, ell' è una scienza non conoscitu e poco aprezzata, ma non era già anticamente, perché grandissimi signori vollono sapere questa scienza...Signore, farete molto bene volerlo sapere, ché vi darà poi intelletto di mille gentilezze."

108 Ibid., Spencer Edition, Book Seven, 93. In Grassi Edition, Libro Settimo, 209. "|...f. 54 r| A dire il vero, se voi sapesse disegnare bene, voi più facilemente intendersi queste cose, ma perché voi le possiate bene intendere, io ne disegnerò alcune di queste cose, le sue forme e anche loro ornamenti, secondo che per li antichi si sono trovate e usate. Solo, al disegno vi conforto, perché poi da voi medesimo le farete e' ntendere."

109 Ibid. "|...f. 54 r| Non per ancora, imparate pure a fare la figura, perché in essa contiene ogni misura e proporzione di colonne, e anche d'altre cose, ma perché ben possiate tenere a mente, e anche poi voi quando alcuna ne volessi disegnare, che voi possiate sanza troppa difficultà farle, e come dell'arte misure le quali avete scritte, queste ancora bisogna con più efficacia scrivere e farne ricordo."

Filarete's primary observations with regards to drawing, quoted below, clearly reveal his differentiation between drawing related to painting and drawing related to architecture. In Spencer's translation the passage is as follows: "I think the first thing necessary for anyone who wants to draw is to know and understand what drawing is, its origin, how its principles and their consequences can be understood. Everything done by hand is based on the order and rules of drawing. Number is very necessary. Nothing can be done without number, as nothing can be done without order. Hence it has been discovered that without it we would be almost like the brutes."[110] I suggest this passage is to be translated as: "I think the first things that are necessary for a person who wants to design is to try to learn what is drawing and its methods, its rules and its improvement." Even though the act of (figural) drawing is emphasized, number and order are brought into the discussion.[111] Pointing to the many occasions in which Filarete uses these ingredients throughout the book certainly locates drawing within the boundaries of architecture.

In his section on *perspectiva artificialis*, Filarete points to the fact that artists prior to the Renaissance were not aware of perspective and had not used it: "…even though their [artists'] intellects were very subtle and sharp, still they never used or understood perspective. Even though they exercised good judgment in their works, they did not locate things on the plane in this way and with these rules."[112] He continues to justify the benefits of perspective, using the most common criticism[113] that existed against the use of it as a starting point: "You can say that it is false, for it shows you a thing that is not. This is true; nevertheless it is true in drawing, for drawing itself is not true but a demonstration of the thing you [are] drawing or what you wish to show." This passage is most astonishing, as in order to defend perspective Filarete refers to the fact that drawings themselves are but demonstrations of ideas and thoughts.

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110 Ibid., Spencer Edition, Book XXII, 296. In Grassi Edition, Libro Ventiduessimo, 639. "|173v|La prima cosa che mi pare che bisogna a uno che voglia disegnare è d'intendere a vedere che cosa è disegno, e donde ebbe origine, e in che modo si può intendere e' suoi prencipii e progressi; e come ogni cosa che di mano si faccià è fondata sotto quest e modo di disegno. Come che di numero è cosa molto necessaria, e non si può fare sanza questo numero, come che sanza l'ordine non si può, per questo è stato trovato; ché sanza esso quasi come animali bruti saremo."

111 The importance of measurability, scale, and order, which are refereed to abundantly, by Filarete, distinguish drawings pertaining to the field of architecture from painting, as the importance of these elements to an architectural discourse is undeniable.

112 Filarete, On Architecture, Spencer Edition, Book XXIII, 305. In Grassi Edition, Libro Ventitreesimo, 657. "|...f. 179 r| Gli antichi, benché sottilissimi e actuissimi fussino, niente di meno mai fu usuata né intesa. Questo modo di questa prospettiva, benché loro usassino buona discrezione in quelle loro cose, pur non con queste vie e ragioni ponevano le cose in sul piano."

113 This defense of the perspective system takes Alberti's definition in *On Painting* as its point of and departure, but Filarete then advances arguments that are widely repeated by his successors, Piero della Francesca and Leonardo da Vinci.

Filarete follows his argument by claiming that the reason artists such as Giotto did not use perspective was definitely because they did not know about it: "To prove that this is so, look at their buildings, for sometimes the figures are almost as large as the houses. Many times they also show the above and the below of something at the same time. You could perhaps say that they knew it but did not wish to use it in order to avoid taking pains. This is even less trouble, for when a man knows it, he can make everything to measure. You always have a guide for whatever you wish to do, you know where you have to locate things, and you cannot err. Thus I conclude and say to you that if you wish to be a good master of drawing, you need to understand and use it when you draw."[114] In this passage the argument is mainly concerned with proving the benefits of perspective from the point of view of painting. What can be deduced from Filarete's statement about the validity of correct perspective and its relation to architecture concerns the important question of determining an appropriate proportional relationship in buildings.

In one instance, Filarete describes the process of transferring his ideas to the builders, so that his design will be built. His description sheds light on the construction process, and the commissioning of work to *capomaestri*. He claims that once the arrangements were made and everything was prepared, he "explained the drawings and the proportions [to them]."[115] Here I believe the Spencer translation falls a bit short, as the Italian reads as "*mostrati I modi e gli disegni*" which means "I *showed* them the measurements (I believe here *modi* as module would imply both proportions and measurements) and drawings" (my emphasis). The reason why I insist on "showing", which is a visual activity, is because in the next paragraph Filarete himself emphasizes the fact that he had to explain by pairing the words "*vedere e intendere*" so that the masons would have to

114 Ibid., Spencer Edition Book XXIII, 305. In Grassi Edition Libro Ventitreesimo, 657-658. "|…f. 179 r|Tu potersi dire: questa è falsa che ti dimostra una cosa che non è. Egli è vero, nienete di meno in disegno è vera, perché il disegno ancora lui non è cosa vera., anz'è una dimostrazione di quella cosa che tu ritrai o che tu vuoi dimostrare. Sì che, adunche, questa è vera e perfetta a questo, e sanza essa non bene si può fare l'arte del dipingere, neanche in iscolpire. Tu potresi ancora dire:tu m'hai tanto lodato e'dipintori antichi, e Giotto e degli altri assai che non usavano queste misure, nè tante cose quanto bisogna avere, e pure erano buoni maestri e facevano belle e degne cose. Tu di' vero, ma se avessino inteso e usate queste vie e modi e misure, sarebbono stati molto migliori; e che sia vero, guarda a quegli loro casamenti, ché alcuna volta erano quasi maggiori le figure che le case; e ancora facevano molte volte vedere el di sotto e' di sopra della cosa a un tratto. Tu potresti dire: forse lo sapevano, e non lo volevano usare per meno fatica. Questo non, ché molto meno fatica è quando l'uomo la sa, ogni cosa si fa con misura, e hai sempre la guida a quello che vuoi fare, e sai dove hai a porre le tue cose, e non puoi errare, sì che io ti dico e concludo, se vuoi essere buono maestro di disegno, che ti bisogna d'intenderla e d'usarla quando hai a disegnare."

115 Ibid., Spencer Edition, Book VIII, 107. In Grassi Edition, Libro Ottavo, 240-241. "|... f. 62 v...|E fatto questo ordine o proveduto a tutte le cose necessarie,…, mostrati I modi e gli disegni e dato a'ntendare in prima quello volevo prima fare, e così fatti i modelli degli ornamenti dell' edificio volevo prima fare, cioè d'imbasamenti e cornici e architravi e porti, subito con gran cellerità e prestezza si diè ordine a scarpellare le pietre per lo antendetto tempio, il quale intendo, com'io ho detto, in prima edificare. De quali imbassamenti e cornici e arcasegnerò la ragione, e perchè elle si trovorno, e così le loro forme mosterrò ancora in disegno, in modo si portanno vedere e intendere e loro misure e proporzioni..."

"see and understand". Filarete continues: "I made models of the building's ornaments which I wanted done first, that is the basements, cornices, architraves, and doors. With great speed and dispatch orders were given to carve the stone for the aforementioned temple I intended, as I said, to build first its basements and cornices. I gave the masters my specifications; so that they could see and understand them and the forms. I explained everything again and with drawings in such a way that they could see and understand them and the measures and proportions…"[116] While Spencer translates "I showed them with drawings", the Italian is "*mosterrò ancora in disegno*" which I would read as "I showed them by drawing" (on site).

Once again Filarete's narrative leads us through time by reviving the Quattrocento *cantiere* (construction workshop and job site) and informs us of the combination of methods used by architects in order to attain their desired results. One can imagine that when Filarete first describes the drawings and proportions he is probably referring to general drawings that show the organizing logic and depict the project in its entirety. However, the later allusion to models and a re-explanation of drawings makes us think of a very specific location, or elements that needed more elaboration. The tripartite scheme of verbal means (through explanations in situ), graphic means (drawings made previously by the architect), and actual means (models as elaborate indications by the architect that help explain part or the entirety of a project) is highly sophisticated.

Filarete's recurring allusion to the fact that drawings in different scales communicate sets of different information is indeed complex and important to a thorough understanding of his ideas as well as their relationship to those of his contemporaries. To resume our brief inquiry into Filarete's abundant and active use of drawing in his treatise, we refer to the following passage. He claims that it would be impossible to "explain clearly this business of building if it is not seen in a drawing. It is even difficult to understand it in a drawing."[117] He further elaborates that those who do not draw cannot understand architecture, and points to the fact that understanding a drawing is indeed harder

116 Ibid.

117 Ibid., Spencer Edition, Book Six, 70. The Grassi Edition is in Libro Sesto, 184-5. "|...f. 40 r|È impossibile a dare a intendere queste cose dello edificare, se non si vede disegnato, e nel disegno ancora è difficile a'ntendere. E non lo può bene intendere chi non intende il disegno, perché è maggiore fatica a'netendere il disegno che non è designare. E questo pare che sia contro alla ragione, perché molti disegneranno per una pratica, e non intenderanno quella che faranno. Non si maravigli nessuno di questo, qu'io ho veduti molti essere stati tentuti buoni masteri di disegno, cioè dipintori e anche d' altra arte che apartiene al disegno, neanche senza esso si può fare simili arti, e se tu gli domandi per ragione hai tu disegnato questo casamento, o vuoi dire figura o animale o quello si sia, non te lo saprà dire. E niente di meno, a chi non intende el disegno parrà che stia bene, ma se gli è poi da uno che lo'ntendere l'errore, e come e dove e con che misura vuole essere fatta quella cotal cosa o figura o animale o quello si sia altri, vedrà che gli arà mancamento |f. 40 v|assai, benché all'occhio paia bello. Sì che none stimi nessuno il disegno essere poco, ché non è cosa niuna che di mano si faccia che non consista nel disegno, e per uno modo o per un altro; e non è sanza grande ingegno d'intelletto, a chi lo vuole intendere come richiede essere inteso."

than drawing it. He explains that even though this might not sound contradictory, there are people who can draw well, yet who are not able to understand why they have done such a thing. Here Filarete precisely explains that: "I have seen many who are held good masters of drawing, that is painters, and also other masters in the arts related to drawings, who are not able to do anything in this art. If you ask them, 'Why have you drawn this building, figure, animal or anything whatever?' they will not know what to tell you. Nevertheless, it will seem good to one who does not understand drawing. If one who does understand drawing explains his errors, how and where and with what proportion this thing, figure, animal, or whatever should be done, he will see that he has many faults, even though it seems beautiful to the eye. For this [reason] let no one value drawing lightly."[118] This passage is important because a distinction is made between the ability to make figural drawings and that of being a good architect. Filarete is explicit about the necessity of drawing for architecture, but clearly distinguishes the ability to draw from that of conceiving architecture. Crucial to Filarete are concepts of scale and proportion that qualify properly architectural drawing. Also he points to the errors that might happen during the process as unavoidable discrepancies that happen even to those who can draw, and draw well.

Francesco's insistence on the superiority of drawing over other arts becomes more significant when we follow his definition of architecture in the following passage: "if the architect does not possess a nimble and unique insight (*ingegno*) and invention (*invenzione*), how can he expect to practice the art of architecture, because architecture is only a subtle imagination conceived in the mind that appears in the work."[119] Francesco's idea of architecture being born in the mind is not unrelated to Alberti's notion of the *lineamenti* taking shape in one's mind. However in Francesco's case the tone of the passage and the fact that Francesco uses the term "*si manifesta*" (which I have translated as the imagination appearing in the mind), seems to be a less definitive, and even a magical, apparition.

Francesco tends to the essential role of drawing in the first few lines of the preamble of T2, claiming that in the opinion of Eupompo di Macedonia, "No art among human beings is perfectly complete without Mathematics and Geometry. Similarly, not only for him, but also for many other

118 Ibid.

119. Di Giorgio, Trattati, T1, Templi, 36. "|...T10v- L9...|Ma se l'architettore non ha perspicace e singulare ingegno e invenzione, non aspetti mai perfettamente tale arte esercitar potere, imperò che l'architettura è solo una sottile imaginazione concetta nella mente la quale in nell'opra si manifesta." Payne translates the same passage as: "But if the architect does not have a discerning and unique talent and invention, he should never expect to exercise this art properly, for architecture is a subtle vision, conceived in the mind which manifests itself in the work." Also see Payne, Architectural Treatises., 93, 272(21). Payne refers to the resonance of this passage with Vitruvius's view, except that here Francesco's addition of *inventio* (though not unrelated) is distinct from Vitruvius' notion of invention. *Inventio* will be discussed at length in chapter three.

great authors, the arts of design are esteemed no less necessary to all the scientific operations. Drawing, based on these two sciences is fundamental because it lends legitimacy and certainty to the arts of design"[120] Francesco seems to be addressing the same ideas, yet slight changes of emphasis give new meaning to the words. By basing drawing on mathematics and geometry, he suddenly changes the nature of the art, ascribing a scientific substance to it. He thus makes explicit a quality of architectural drawing which was only implicit in Filarete's stories. As well, by nominating drawing as the source of legitimacy for the arts of design, he suddenly shifts the focus and establishes the primacy of design/drawing over any other mode, making it the principal element in relation to architecture.

From there, he states that while *disegno* has been associated with "vile and mechanical arts, it is useful and necessary in every human deed, be it in invention, or being able to explain the concepts, or be it in working/operating, in military arts — in each other part: geometry, arithmetic, perspective to which it could be related—easily considering it being a necessary means in every cognition/awareness and works of feasible things with a straight reason."[121] Elsewhere and following Aristotle, Francesco claims that since drawing is seen, and sight is the noblest of the senses, it is more directly absorbed by the intellect. Thus revelation depends on *disegno*, since "It allows for consideration of visible and invisible things."[122] The connection with the eye will be discussed further in the following chapters. For now, it is important to retain that Francesco's mention of drawing, and the reasons he enumerates for its importance, are deeply connected to his own practice.

CLOSING

To conclude, I suggest looking at one of Francesco's illuminations (Figure 1) in light of the previous remarks. The illumination belongs to an unfinished manuscript, identified as Benedetto Cingoli's

120 Ibid., T2, Preambolo, 293. "|S1-M1...|...nissunna arte perfettamente nelli omini essere senza aritmetica e geometria. Similmente non solo da lui ma da molti altri eccelnti non meno necessaria era stimata l'arte del disegno a quelunque operativa scienzia che le prnominate."
121 Ibid., T2, Preambolo, 294. "|S1-M1...|E benché ai nostri tempi sia reputatat vile e inferiore a molte altre arti mechaniche, niente di meno chi considerasse quanto sia utile e necessaria in ogni opera umana, sì nella invenzione, sì in possere esplicare li concetti, sì nell'operare, sì nell'arte militare-dall'altra parte geometria, aritmetica, prospettiva a questa essere afine- facilmente giudicaria essa essere uno mezo necessario in ogno cognizione e opera dellae cose fattibili, con dritta ragione."
122 Ibid., T2, Quarto Trattato, 399. "|...S 53..| Queste determinazioni sieno suffizienti quanto alla cella tonda et a sé simili col supplemento del disegno, nel quale il senso da vedere giudicherà più che l'audito, come più nobile senso e di più differenzie iudice, come afferma aristotle nel proemio della Metaphisica, e massime in questa arte la quale potissimamente considera cose visibili ecome invisibili."

Quando per far col Bianco Tore Albergo by Caterina Badini[123]. It is the frontispiece for the third chapter of a poem that is a laud to Bianca Sarcacini, dating circa 1472-1473.

Bianca Sarcacini was born in Siena from a noble family and was married to Conte Francesco di Giovanni Luti. As Luke Syson describes, Bianca's mother, Onorata Orsini was one of the most beautiful noble women of Siena, and she was chosen to participate in the betrothal ceremonies of Fredrick II and Eleonora of Portugal.[124] The combination of their legendary beauty and their noble provenance gave both mother and daughter a status in Siena that became the subject of many poets' praise. Syson refers to a note in Bianca's baptismal record, which has been added in her early adulthood in 1453 and reads as such: "the most beautiful, there ever was in the world…nor ever shall be found an equal to her, in whom not only there shine the whole of beauty but also every virtue has its archetype in her, and, since Siena is in the middle of Tuscany, where the most beautiful women are to be found, and since Tuscany is the most beautiful part of the world, it follows that she is the most beautiful woman of the world".[125]

The image depicts Bianca, a beautiful blonde, hovering above the city of Siena. She holds a snowball in her right hand, the symbol of her purity; there is evidence of her left hand holding on to a floating veil.[126]. At her feet, the city of Siena is depicted by its fortification in red, and its edifices in white. I like to use the illumination depicting Bianca as a parable that captures the essence of drawing for Francesco. Similar to Atlas's pose, Bianca's floating posture is simultaneously stable and dynamic. Bianca seems to be detached from everything, floating as gracefully as if she is dancing in a ceremony in the honour of the Ferrante family. Nevertheless she is connected to her origins, to the city, by invisible ties.

Francesco's ability to interpret religious symbols associated with the Virgin and to combine them in drawing, to establish Bianca's position as a patron saint or an angel watching over the city of Siena, demonstrates his ability in illustrating a story.[127] In addition to depicting the story, Francesco

123 Bellosi, Rinascimento, 262-264. Caterina Badini and Andrea di Marchi's catalogue entry for the Ilumniationof Lode di Bianca Saracini.
124 Syson, Renaissance, 204-207. The catalogue entry is entitled: "Bianca Saracini suspended aloft above the city of Siena."
125 Syson refers to Corso, "L'illicino (bernardo Lapini)", Bullettino senese di storia patria, ser. III, 16, 1957, 9.
126 Bellosi, Rinascimento, 263. De Marchi points to the fact that a later faulty restoration has taken away the original sky; Bianca's dress, and therefore most of the veil, has disappeared as well.
127 Syson, Renaissance, 207. Syson suggests that Francesco's implementation of a more religious theme of *Madonna Assunata* (Mary's Assumption), together with the use of the Veil (one of Mary's traits), and the snowball (symbol of purity and also referring to Bianca's name), in that order, makes Bianca not only "a gift of the pagan gods" but a "secular Virgin Mary."

somehow surpasses that text by means of drawing, as he fuses different visual elements together. As Bianca elegantly hovers in a world that defies gravity, Francesco's *Trattati* drawings hover above and beyond the page. They belong and relate to the ideas explained on the page; yet they embody together the intrinsic, extrinsic and the occult. The figure acquires a magical or alchemical identity.

In this chapter I traced a line among the three major theoreticians of the Quattrocento, and their ideas with regard to the act of drawing. Delving deeper into the inner layers of each of the three theorists' formulations reveals that across and through their work drawing subtly gained power in the field of architecture. Alberti's direct contribution to the field of drawing and his verbal comments are not as numerous as those of the other two. There is a development and expansion of drawing's role through Filarete's words. Francesco's drawings uniquely and unequivocally give a voice to the act of drawing and bestow an unquestionable capacity upon it. Through the Quattrocento, and specifically through the words and drawings of Francesco, the idea, process and transfer of architectural thought by means of drawing gradually came to be valued. Architectural thought found more autonomy and gained a life and a validity of its own through drawing.

In Francesco's work drawing became the space of existence for design: the space in which the architect's ideas coalesced; the space in which a yet-unborn building was projected by means of lines and geometrical figures. For Francesco drawing was the major vehicle for conveying architectural thought. In his *Trattati* drawings became perpetual investigations, acting as tools of inquiry for the architect while being a medium for conversations with others.

FIGURE 1. BIANCA SARACINI SUSPENDED ALOFT ABOVE THE CITY OF SIENA
BIBLIOTECA NAZIONALE, MS. PALATINO, FLORENCE.

CHAPTER THREE
INTERLACING *INGEGNO*, *INVENTIO*, AND *FANTASIA* INTO THE FABRIC OF DRAWING

"Now for the thinking soul images take the place of direct perceptions; and when it asserts or denies that they are good or bad, it avoids or pursues them. Hence the soul never thinks without a mental image (*phantasma*)." [1]

"We have already spoken of imagination in our writings on the soul; and we stated there that it was not possible to think without an image (*aneu phantasmatos*); because it is the same thing to think and to draw (*diagrāphein*)."[2]

Aristotle

INTERLACING *INGEGNO, INVENTIO,* AND *FANTASIA* INTO THE FABRIC OF DRAWING

OVERTURE

The main hypothesis of this chapter is that Francesco manifests his thoughts on creative process to the readers by and through drawing. As mentioned in the previous chapter, talent or creativity (*ingegno*), together with invention (*inventio*), and imagination (*fantasia*) are the main forces in Francesco's discourse on drawing (*disegno*). In the *Trattati,* creativity, invention, and imagination are at work and the drawings carry the essence of these agents. Therefore any discussion about the importance of drawing in Francesco's theories would be incomplete if its source was not taken into consideration. The chapter gravitates around the theme of architectural imagination, its source and its power. The ways in which architectural judgment is formed are investigated both in the context of the *Trattati* and in the broader context of the philosophical and cultural traditions influencing Francesco's body of work. To enter into this subject, it is pertinent to start with a story about artistic creativity as narrated by Cicero; then after a brief reference to Francesco's paintings and sculptural

1 Aristotle, De Anima, On the Soul; Parva Naturalia; On Breath, English Translation by W. S. Hett, Loeb Edition, (Cambridge, MA: Harvard University Press; London: W. Heineman,1935, revised and reprinted 1964), 431a 15-2.
2 Aristotle, De Memoria et Reminiscentia, Of Memory and Reminiscence, English Translation by W. S. Hett, Loeb Edition, (Cambridge, MA: Harvard University Press; London: W. Heineman, 1936), 449 b-450a.

works, I will examine the *Trattati*'s text. Contextualizing the question in a broader setting will shed light on Francesco's practice and working patterns, as well as his words.

Cicero, in *De inventione*,[3] narrates the story of Zeuxis the painter to demonstrate the proximity between Zeuxis' way of working and his own. The story goes as follows: when people of Cortona prospered, they decided to enrich their temple of Juno and hired Zeuxis of Heraclea. Upon completing a few paintings, Zeuxis proposed to draw a portrait of Helen, whom he considered to be the epitome of beauty. His heart set on the project, Zeuxis urged the citizens to bring forth all their beautiful maidens, so that he could choose a model among them. Once all the beautiful maidens of the city were assembled, instead of settling on one among them Zeuxis selected five whom he considered the most beautiful. He decided to use the features of all five as the basis of his painting, for "... he did not think that he could find all the component parts of perfect beauty in one person…"[4] Cicero then refers to his own intention in writing his treatise on rhetoric and explains that he could not have satisfied himself with one person's thought and work, but with a collection of the best thoughts said and written by many. While Cicero emphasizes the virtue of having a broader range of choice, whether in the number of maidens present in a city or in the multitude of written and spoken words left by other writers and orators, this story has a slightly different value for us.

Of essence to the present discussion is Zeuxis' idea of Helen's beauty and his insistence upon composing her image by selecting many elements from different sources. The image of Helen, composed by the artist's hand, manifests his creativity at work. In Zeuxis' vision different elements are to be combined to attain the final result. On the one hand this demonstrates the complexity of a composition of images emanating from different sources; on the other hand, it makes clear that the image of Helen emerge can only emerge from Zeuxis' head and hand. The paintings, drawings, and sculptures of Francesco reveal similar working patterns. During the Renaissance the visual arts were a porous field, in which artists imitated, borrowed, and reassembled elements from each others' works. On the other hand, the possibility of cross-disciplinary exchange – or more precisely the absence of disciplinary boundaries – allowed for greater continuity between the different branches of visual arts and architecture. This symbiotic relationship is far from our contemporary understanding of an artistic practice and somehow in opposition to our notion of artistic creativity. That modern notion of the isolated and specialized artist would in this sense have been alien to the artists of the

3 Cicero, De Inventione, De Optimo Genere Oratorum, Topica, With an English Translation by H. M. Hubbel, The Loeb Classical Library, (Cambridge, MA: Harvard University Press; London: William Heinemann LTD., reprint 1960) book II, i- ii, 167-169.
4 Ibid.

Renaissance. A couple of drawings by Francesco are referred to in order to indicate both the cross-disciplinary forces at work and the idea of creation and invention in his work.

The drawings in question consist of a sketch and two frescos in the Bichi Chapel, in the church of Sant' Agostino in Siena, executed some time in the space of 1488-1491.[5] The preparatory sketch, Figure 1, done in the span of 1488-1490, is made by pen and brown ink on paper. The grisaille frescos depict the Nativity of Christ (Figure 2) and the Birth of the Virgin (Figure 3). In *Renaissance Siena*, Syson speculates that the sketch was "entirely improvised, drawn out of the artist's head" as there does not seem to be any trace of any underdrawing, or other guides for the architectural elements.[6] He suggests that Francesco has attempted to create continuity between the two scenes by adding a circular building located at the center of the page. Syson points to a suggestion made by Weller who states this preparatory sketch, in terms of energy and vivacity, is similar to the bronze reliefs made by Francesco.[7] Syson equally refers to Bellosi's opinion about the rapid hatching which creates an effect similar to that of Francesco's reliefs.[8] Syson's argument, building upon the suggestions of Lowic and Bellosi, qualifies Francesco's frescos and his preparatory sketch as having close ties to sculpture and relief works, as well as some of his later paintings from 1470 onward. Syson claims that by eliminating colors, Francesco indeed turned those frescos into "enormous fictive stone reliefs."[9]

By suggesting that Francesco's drawing is related to his sculptural reliefs as well as his paintings, Syson essentially argues that drawing strengthens Francesco's sculpture and painting. Syson's recognition of drawing as the connecting element between different disciplines of painting and sculpture can be extended further to include Francesco's other fields of activity and in particular architecture. At this point it suffices to say that the medium of drawing became Francesco's testing ground in his efforts to push the boundaries of one form of expression into another. Francesco did a similar thing within each field as well, since his drawings in the *Trattati* explored and through that exploration laced threads between many different facets of the architectural profession. In the *Trattati*, drawings act as the thread linking all the pages of the work to each other. They take many different forms depending on the specific intentions of the architect, as will be studied more extensively in Chapter Four.

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5 Syson, Renaissance, 153-155.
6 Ibid, 153.
7 Weller, Di Giorgio, 182.
8 Bellosi, Rinascimento, 27-29.
9 Syson, Renaissance, 154.

If we look at the preparatory sketch carefully, aside from the circular building, we can find a number of other continuous elements in it. The correspondence of certain horizontal lines across the two scenes, the presence of the classical architecture as backdrop even in the nativity scene, and the hatched shadows of the figures in the foreground suggest a continuous flow of thought through the sketch. One can identify a similar connection between Francesco's flow of thought and his drawings in the pages of the *Trattati*. To investigate these manifestations of Francesco's imagination, we will look at those of his drawings and words that concern the process of idea formation by expanding on notions of creativity, invention and imagination. Similar to that circular building spanning between two instances of the birth of Mary and of her son, subtle connections can be identified between the above-mentioned concepts and Francesco's drawings. His constant recourse to drawing as a medium capable of reaching beyond a given discipline is an important notion. Hence, I suggest that drawing is Francesco's primary language and lines, tones and hatching are his main means of communication.

Francesco's treatment of creativity, invention, and imagination will be examined in tandem with *giudizio* (judgment), a capacity that for him is inherently connected to our senses – and specifically to our ability to see. This will be followed by a close examination of one of the sketches from Francesco's sketchbook, an image later elaborated in T1 and T2. Following the progress, evolution, and life cycle of this sketch into its more developed form in the pages of the *Trattati* should prove fruitful since it focuses on one train of thought developed during a maturing process. Expanding the initial hypothesis, I will claim that the elements of imagination, creativity, and invention are all embedded in Francesco's drawings, and the drawings and text reveal a complex and intricate intertwining.

CREATIVITY/ INVENTION/IMAGINATION[10]

We turn first to the terms from the *Trattati* which relate to the processes of formation of architectural ideas and its manifestations. The first is creativity (*ingegno)*, which appears extensively in relation to the conception of architectural ideas. Coupled with *ingegno* in this context is invention (*inventio)*. Imagination (*imaginazione)* and fantasy (*fantasia)* appear less frequently than these major themes.

As maintained in the previous chapter, *ingegno* could be either understood as talent or creativity. If we study the etymological[11] definition of *ingegno*, we see that *ingegno*, originally stemming

10 The translations adopted below of Francesco's three key terms *ingegno*, *inventio* and *fantasia* are my own. Based on the etymological and contextual meanings of each term, these words are used as their contemporary representatives.

11 The etymological definiton of *ingegno* in the online version of the *Vocabolario Etimologico della Lingua Italiana di*

from *genio* and sharing spheres with *ingenere*, is a natural, innate capacity to operate, invent, and plan; or it is simply a talent associated with the mind. David Summers states that *ingegno* is "the talent, the natural gift of a person, and is opposed to what may be learnt from art and experience….used to refer either to natural talent in general, or to the results of the exercise of the talent, to those characteristics of work attributable to the innate differences of one artist from others." [12] In the Quattrocento the use of the term *ingegno* was widespread, and before we focus on Francesco's *Trattati* it would seem wise to contextualize our discussion by referring to secondary sources that address this notion in painting and architecture.

In *Giotto and the Orators*, Michael Baxandall elaborates on the term *ars* and *ingenium*.[13] In discussing *ars*, which he qualifies as "skill, craft, profession, theory, and treatise", he observes that *ars* was used in medieval Latin, mainly appreciatively to qualify a notion of "the skill or workmanship, of an artist, or a work of art one liked."[14] He confirms that Petrarch and the humanists used it to refer to similar qualities in these spheres. However, eventually, as the humanists became more preoccupied with classical precedents, *ars* came to be understood in a more strictly defined relationship to terms such as *ingenium*, which had been discussed and elaborated upon extensively in classical rhetoric. Baxandall emphasizes that as *ars* represented the skill or ability that was to be learnt by "rule and imitation", it became opposed to *ingenium*, "the innate talent that could not be learnt".[15] He argues that the meaning of each word was defined through its opposition with the other, rather than its independent meaning. Therefore each pertained to a particular realm and came to acquire specific characteristics. *Ingenium* was more associated with invention, and *ars* with style. Baxandall adds that while medieval writers were as familiar with much of classical rhetoric as were Renaissance humanists, the medieval use of those terms and their associations was neither as significant nor as strictly delimited in sense as they were in the Renaissance.

Baxandall claims that the pairing of *ars et ingenium* became simultaneously a critical and

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Ottorino Pianigiani. http://www.etimo.it/?term=ingegno&find=Cerca. 01/04/2010. **Ingégno** *ant. sp.* engeño, *mod.* Ingenio: dal *lat.* INGÈNIUM, comp. da IN partic di appogio e GÈNIUM che deriva dalla stessa base di GÌN-O o GÌGN-O '*geenro, produco* (v. *Genio* e cfr. *Ingegnere*)./ Natural potenza d'intendere, d'inventare, di disposare, di operare, dello spirito umano; Perspicacia, Talento, Mente; fig. Trovato dell'ingegno, quindi Ordigno Macchina (cfr. a. *fr.* Engianier vincere in astruzia, prov. Engenhar insidiare). *Deriv. Ingegàccio-íno- óne- úccio- uòlo- úzzo; Ingegnére; Ingegnò.*

12 Summers, Judgment, 99.

13 Michael Baxandall, Giotto and the Orators: Humanist Observers of Painting in Italy and the Discovery of Pictorial Composition 1350-1450 (Oxford: Clarendon Press, 1971). Baxandall's book studies the formulation of humanist thought in relation to Renaissance painting between 1350 and 1450. While his work is primarily focused on painting, his study of the use of language and its effect on the artists' works relates to our topic of discussion.

14 Ibid., 15.

15 Ibid.

polemical weapon for the humanists of the Renaissance, to the extent that one could not speak of one of them without mentioning the other. He states that by 1400, praising a person strictly for his *ars* meant he had no *ingenium*. The humanist sense of the interdependence of *ars et ingenium* can be extended to arts other than painting, specifically to architecture. We can identify among Francesco's motivations for writing a treatise on architecture a desire to provide a theoretical basis for the field, a series of rules, structures, and tools: in other words, *ars*. Simultaneously, his emphasis on the necessity of creative talent on the part of the reader (the reader's active participation in understanding, absorbing and ultimately implementing the ideas), acknowledges the importance of *ingenium*.

Baxandall also points to multiple variations of *ars et ingenium* such as *ars et natura* or *artificium et ingenium* or *manus et ingenium* in the written works of the Renaissance.[16] He suggests that even though the humanists inherited the term from the classics, during the Renaissance the coupled term developed its own character. Baxandall claims that *ars* became more exact in connoting "skill capable of teaching and learning from rules and models" while *ingenium* implied "associations which presented themselves in the form of issues about the genius and imagination of the artist". Baxandall argues for understanding *ars et ingenium* not as extreme polarities, but as a common umbrella under whose shelter rules and creativity would coexist during the 15th Century. I believe the perception of *ars et ingenium* as a combined quality is reflected in Francesco's *Trattati*. As I have already postulated, since Francesco's theory would lose its force without drawing, the inclusion of drawing at that substantial scale requires an understanding of *ars et ingenium* as a combined quality. This inclusion implies the understanding of drawing as a communicative medium. Simultaneously drawing is also associated with imagination and creativity. This combination of skill and thought, of product and ideation, is precisely reflected in the role drawings play in the *Trattati*.

Significantly for our discussion of *ars* and *ingenium*, David Summers in his *The Judgment of Sense* elaborates on the notion of *ingenium* in architecture in relation to judgment, which he claims was predominately guided by the senses in the Renaissance. Summers contextualizes the use of the term *ingegno* in the context of architectural theory. He refers to two major theoreticians: Vitruvius and Alberti. In examining the relationship between judgment (*indicium*) and optical correction, Summers refers to Vitruvius's formulation of *ingegno*. [17] He points out that for Vitruvius, in order to achieve

16 Baxandall, Giotto, 16. Among other examples, Baxandall refers to a passage in Ghiberti's *I Commentarii* in which he claims: "Lo ingegno sança disciplina o la disciplina sança ingegno non può fare perfecto artefice" CF. Lorenzo Ghiberti, I commentarii, Edited by Julius Von Schlosser, (Berlin: Julius Bard, 1912), 5. This passage in Ghiberti is close to one in which Francesco pairs up *ingegno* with *dottrina*, and later to *disegno*.

17 Vitruvius, Ten Books, Hicky Morgan Edition. VI. II. 2. We will return to this discussion in elaborating upon

eurhythmia, one needs to adjust the proportions of a building. To do so, one cannot apply *doctrina* (the rules that determine the proportions at the first place), but *acumen ingenii*. Summers then emphasizes that, in Vitruvius's words, to overcome the fallacies of sight, one needs *ingenium*, which as "the natural gift of the architect", if combined with the appropriate *doctrina*, could acquire *acumen*.[18]

Summers observes that in Alberti's account of the development of Greek architecture the issue of judgment is considered closely related to *ingenium*, as it has been for Vitruvius.[19] Alberti maintains that buildings considered praiseworthy for the hand of the artisan, whose work called for *ingenium,* are better than those recognized for the wealth of the king. He also mentions that the Greeks, by observing the Egyptians and the Assyrians, were able to develop an architecture that was "pleasing to the skillful (*periti*), and in which the gifts of *ingenium* were reflected"[20]. Summers argues that Alberti's account of the history of Greek architecture is particularly valuable as it demonstrates a "self-consciously normative account of Florentine Renaissance architecture".[21] Summers elaborates that for Alberti the architect is a "specialist" who has knowledge of different types of buildings and construction methods, and such knowledge is "the material with which his *ingenium* must work". [22]

Vitruvius and Alberti matter as each had influenced Francesco in a significant manner. Vitruvius, whose work was directly assimilated in T1 and referred to in T2, can be considered Francesco's mentor in the realm of architecture. Likewise, Alberti was a major contemporary scholar and architect whose work Francesco had read and reflected upon by the time he wrote T2. They both privilege *ingegno* as the most unique trait distinguishing an architect. In examining the pages of the *Trattati*, we come across a very specific reference to creativity (*ingegno*) and invention (*invention*). Francesco emphasizes that "… if the architect does not have shrewd and singular creativity and invention, no aspects of this art can be exercised, because architecture is only a subtle imagination conceived in the mind that manifests itself in the work."[23] Francesco continues by explaining that it is not possible to teach each and everything by reason as "creativity resides more in the mind and the

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the notion of *sottilità* in Francesco's work.

18 Summers, Judgment, 48-49.

19 Summers refers to Alberti's sixth book. Cf. Alberti, The Art of Building, Rykwert Edition, Book Six, Chapter 3, 157-8.

20 Ibid., 136.

21 Summers, Judgment, 137.

22 Ibid.

23 Di Giorgio, Trattati, T1, Templi, 36. "|T10 v - L9…|Ma se l'architettore non ha perspicace e singolare ingegno e invenzione, none aspetti mai perfettamente tale arte esercitar potere, imperò che l'architettura è solo un sottile imaginazione concetta in nella mente la quale in nell'opera si manifesta. Anco è da notare che l'ogni e ciascuna cosa non si può la ragione assegnare, perché lo ingegno consiste più in nella mente e in nello intelletto dell' architettore che in iscrittura o disegno, e molte cose accade in fatto le quali architetto overo opratore mai pensò."

intellect than in writing or drawing." Francesco concludes by stating that many things will occur in the course of practice which "the architect is involved in without ever thinking about them."

As we can see, immediately after mentioning *inventio* and *ingegno*, architecture is described as a subtle imagination created in the mind. This formulation encapsulates Francesco's notion of an architect's abilities and determines the geography and purpose of theory. The fact that Francesco precisely locates the *ingegno* in the mind and not in written text or drawn figures demonstrates that from his point of view theory would not supply all that is necessary en route to becoming an architect. *Ingegno* is an innate quality that someone is born with. Francesco's precision in associating *ingegno* with the mind excludes any possibility of acquiring it through work and practice. *Ingegno* must be inherent in the architect. It is a recurrent theme in the *Trattati* that in the absence of creativity (*ingegno)* one is unable to profit from writing and drawing. The same notion is also mentioned in a passing comment from the chapter in T2 discussing fortifications, in which Francesco again confirms that "One must supply creativity (*ingegno*) to text and drawings."[24]

In a passage on temples in T1, Francesco pairs creativity with doctrine (*dottrina*), as necessary agents for the architect. Francesco claims that "As says Vitruvius, the architect needs creativity and doctrine, because creativity without doctrine, or doctrine without creativity, will not make the perfect artisan."[25] Here he claims that creativity without knowledge or vice versa would break the continuity of an architectural process. This passage is significant as its reappearance in a different format in T2 indicates the continuity of Francesco's train of thought, and simultaneously demonstrates a more persuasive insistence of the role of drawing.

In chapter two, we referred to the fact that a similar passage in T2 reiterates this thought, this time adding drawing as the third element necessary to the process.[26] If we stay with the premise that T2 is the mature version of Francesco's thoughts and remember Maltese's[27] suggestion that the aforementioned passage was a response to Alberti's theories, the addition of *disegno* to Francesco's concerns becomes more significant. By revising the relationship between *ingegno* and *dottrina* through

24 Ibid., T2, Forme di Rocche e Fortezze, 483. "|...S 42...| Adonque fa di bisogna supplire con lo ingegno alla scrittura e pittura." Although here Francesco is using *pittura*, I have chosen to still translate it as drawing, which I believe is closer to the intended meaning of the passage.
25 Ibid., T1, Templi, 37. "|T10 v - L9…|E siccome dice Vetruvio all'architetto ingegno e dottrina a lui bisogna, perché lo ingegno senza dottrina o la dottrina senza ingegno l'artefice perfetto non può."
26 Ibid., T2, Parti e Forme di Porti, 489. "|...M88 -M88 v|... perché siccome noi veddiano sono molti che hanno la dottrina e non hanno l'ingegno, e molti dotati d'ingegno e non di dottrina, e molti hanno la dottrina e lo ingegno e non hanno el disegno.. The translation would be : because as we see there are many who have *dottrina*, and many who have *dottrina* and *ingegno*, and many who have *dottrina*, *ingegno* and so not possess *disegno*."
27 Ibid., T2, 489 (1), footnote by Maltese.

the addition of *disegno*, Francesco articulates a cyclical relationship of the three terms as well as their corresponding capacities and practices. He thus underlines the central role of drawing: we can deduce that for him drawing as a medium was crucial to the process of connecting one's creativity with the set of pre-established rules and principles. The modification of this passage in T2 implies that the missing link between one's creativity and a set of rules is to be investigated and resolved in drawing.

Not unrelated to the above-mentioned passage is another one in T2, in the chapter on Temples, in which Francesco pairs creativity (*ingegno*) with the term skill (*arte*) in speaking of the elements that should regulate the process of imitating nature.[28] The subsequent passage encapsulates Francesco's development of the themes of *ars* and *ingenium*, contextualized by Baxandall in terms of other Quattrocento works. Francesco states that it is necessary to reason that "all of our sensual appetites" be satiated; and he specifies that they should be ruled by "principles *(arte)* and talent *(ingenium)*" in building every "divine or sacred" temple. He adds that there are different opinions regarding what are the "origins and principles" of making churches and reminds us that many "cunning and speculative geniuses" have exhausted themselves in order to imitate nature in their endeavours.

Thus we observe that various uses of *ingegno* are frequently present in Francesco's discussions of architectural thought and creativity. In that light, the couplings of *ingegno—inventio*, *ingegno—dottrina*, *ingegno—disegno* and ultimately *ingegno—arte,* show us the wide range of functions and roles that *ingegno* can undertake. In the *Trattati*, *ingegno* comes across as the force or capacity necessary to the development of an architectural idea. Never stated explicitly, there is also a sense that possessing *ingegno* enables one to exercise judgment throughout the process. Thus, *ingegno* is the guiding light of creativity, shining through and illuminating the way for the architect to find his way in making *disegno*.

In the end it appears that for Francesco the main criterion for assessing the value of architectural work is *ingegno*: the comparative value of differing judgments depends on who has shown the subtlest *ingegno*. In referring to the criteria which would determine the most beautiful house design in T1, Francesco claims: "Then some made their house in triangular form and some in square form, from the more beautiful to the more mundane, depending on who was better and had a

28 Ibid., T2, I Templi, 402. "|…M42...|,Perché appare molto più necessario alla ragione dovere satisfare che alcuno nostro sensuale appetitio, e massime quelle che con arte e ingegno debbano essare governate, siccome in el costituire alcuno divino o sacrato tempio, e perché e sono molte varie opinioni donde tal partimento abbi avuto origine o principo, è da considerare che molti solertia e speculative ingegno si sieno affaticati imitare la natura in tutti li esercizi,..."

subtler creativity than the others."[29] The term subtlety, (*sottilità* or *subtilitas* in Latin) will be discussed further on in the present chapter.

Now that we have touched upon *ingegno* as the primary element necessary for arriving at *disegno*, let us look at a few passages in the *Trattati* in which *inventio* is discussed. It appears that for Francesco invention (*invention)* is necessary to the perfection of architecture and is on par with creativity (*ingegno)* in significance. Looking at the etymological[30] meanings of *inventio* reveals that, although its main connotation is to invent and create from scratch, it also relates to *invenire*, which means to find or to come upon something. It seems that Francesco uses the word in both connotations. In a passage on Fortresses in T2, Francesco emphasizes the value of invention and its relation to drawing: "Ultimately, as I had said that invention (*invenzione*) is necessary to the perfection of art, many people, having built in their mind a building with its convenient proportions, cannot then realize it, not knowing how to show it either to themselves or to others with drawing (*disegno*)."[31]

Here invention is followed by having images of a certain building in the mind, suggesting an understanding of invention that seems more aligned with pure imagination. This relation between active imagination and the need to invent is more prone to the first and primary meaning of *inventio*. Other examples, including the many allusions Francesco makes to the design of the machines in calling them *le mie invenzione* —notwithstanding that the machines were at least in part copied from Il Taccola, and many of them existed before Francesco's time — make us realize that the second meaning of *inventio* as what one comes upon, reinterprets, or rediscovers, seems more pertinent. Even though the sources are other than Francesco's own imagination, the combinations and variations are his own and are referred to as his inventions.

In a passage selected from the chapter on wheels' levers and mills in T1, Francesco's thought with regards to invention and its connection to drawing becomes apparent.[32] He claims that he will

29 Ibid., T1, Archtitettura Aantica e Moderna e Pratiche Costruttive, 67. "|T 16v…|, Dipoi chi in triangolo e in quadrangolo la sua casa facìa, chi più bella e chi più sozza, sicondo chi era di migliore e più sottile ingegno uno che un altro."

30 The etymological definiton of *ingegno* in the online version of the Vocabolario Etimologico della Lingua Italiana di Ottorino Pianigiani. http://www.etimo.it/?term=invenzione&find=Cerca. 0/04/2010. Invenzióne *lat.* INVENTIÒNEM da INVÈNTUS part. pass. d'INVENÍRE *trovare investigando* (v. *Inventare*).Scoperta di cosa nascosta e non per anco conosciuta, Invenire: trovare, scoprire

31 Di Giorgio, Trattati, T2, Forme di Rocche e Fortezze, 484."|...S 42...|Ultimamente, perché come ho ditto la invenzione è necessaria a perfezione dell'arte, molti, avendo in la mente fabbricato un edificio con le sue conveniento proporzioni, non possono poi mettarlo in opera, non sapendolo né a sé né ad altri col disegno dimostrare."

32 Ibid., T1, Leve di Ruote e Mulini, 142. "| ...T 33 v...|, E per simili ragioni le lieve della rote son da fare, e

demonstrate every form of those wheels' levers in drawing. He immediately continues by stating that "it is difficult to show every thing in drawing (*disegno*), because in writing many things cannot be expressed, and because we are preoccupied with such a variety of things interrupted by and contrary to one another that it is almost necessary to make an example (*modello*) of every one". This in itself is of interest, since this passage conveys the sense that Francesco is using the term "example" (*modello*), not to refer to a real three dimensional model, but to a drawing. If this assumption is correct, then the identification of the drawings as *modello* bestows both power and authority on the three-dimensional views of the machines, assuming that they will create the same effect as a physical model and that they will give the reader a sense of how the machines function.[33] The machine drawings become instruments of speculations of all kinds, varying from mechanical to philosophical.[34] They turn into mechanisms of study, marvel or display, discerning cause-effect relationships.

A counter-argument to this hypothesis might be that as the *modello* is paired with the verb *fare*, which would be literally translated as making a model, it might imply that Francesco is talking about making actual models. This seems contradictory, as one would not necessarily make a model of the machine, but the machine itself. Francesco continues by stating that even though many things appear "easy to the soul of the architect", once they are realized, there will be faults found in them, which would be hard to remedy then.[35] He concludes that he has not "seen most of the inventions (*invenzioni*) that are demonstrated here in person."[36] I believe the whole passage reveals a subtle, continuous thread suggesting that the multiplicity of the machine drawings, in parts, compensates for the lack of the actual physical one and the proximity of drawings and invention displays close ties between the two. Francesco's statement about not having seen many of the inventions he is demonstrating could mean that he has copied these things through Taccola or others, and his

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massime in molti vari edifizi, come di mulini e altre cose che di continovo all'archtiectto occorendo accade, siccome qui di sotto alcune formazion d'esse figurate mostraremo. Quantunque difficili sia in disegno ogni cosa demostrare, neanco per scrittura in alcun modo molte cose spriemar non si può, perché son tante le varietà delle cose interrotte e opposite l'una all'altra che a occupare si vengano, e però è necessario quasi di ciascuna cosa modello fare. Posto che molte cose all'animo dell'architetto paia facile, e che riuscir li debba, che mettendolo in effetto gran mancamenti in essi truova, in ne'quali con difficultà reparar vi può. Io per me delle invenzioni che qui demostrate seranno, d'assai buona parte, in me non confidando, spirienza ho veduta."

33 If this assumption is not correct, then the passage becomes somewhat ambiguous, as it would not be clear what model he is referring to. This topic will be examined in more depth in chapter four.

34 Jonathan Sawday, Engines of the Imagination, Renaissance Culture and the Rise of the Machines (London: Routledge, 2007), 31-55. Sawday discusses Leonardo da Vinci's machines and suggests that such machines should be re-imagined as operating within the landscape for which they were designed. He particularly emphasizes the importance of water for Leonardo, and likens his machines to his anatomical studies, both combining mechanical knowledge with organic understanding. Sawday relates Leonardo's and his contemporaries' interests in water to the fact that water was the most important source of energy, and therefore had critical impact on numerous human operations.

35 Di Giorgio, Trattati, T1, 142.

36 Ibid.

depictions are based on verbal or drawn accounts. Or, it could mean that, in tune with the idea of invention, he reminds us of the novelty and originality of his invented machines, which had no parallel before.

The most critical theme related to invention is Francesco's idea of infinite invention. One of the most singular passages of the *Trattati* is the one in which Francesco expands on the notion of invention in T2 in the chapter on the fortresses.[37] Since the passage is lengthy, I have broken it into several sections. First, referring to the minds of mortals, Francesco states that mind is "everlasting and incorruptible" and demonstrates its "infinite virtues": it has a taste for "infinite time", it can imagine "infinite numbers", it learns "infinite figures, in which there are infinite angles." Francesco claims that the mind of an educated person functions differently from the cognitive virtue of animals

37 Ibid., T2, Forme di Rocche e Fortezze, 482-4. (This entire part does not exist in M). "|…S 41 v|, La mente de'mortali come perpetua et incorruttibile, in alcuno modo demostra avere in sé virtù infinita, peroché appetisce essere per tempo infinito, considera el tempo infinito, immagina numero infinito in modo che a ogni numero fa addizione, apperende infinite figure, come infiniti possono essere li anguli, contempla uno corpo e magnitudine infinta, come appare in li idioti {incolti} che non possono immaginare sopra lla ultima spera essere nulla, {che non riescono a pensare che al di sopra dell'ultimo cielo non vi sia più nella}, come quello intelletto non è coartato e coscritto in grandenzza comporta quanto all a sua operazione, similmente per ragione giudica come necessario ogni magnitudine dividersi in infinito in potenzia.{come comporta il modo di operare dell'intelletto, che non pone limit di grandezza e ragionando postula che ogni grandezza sia potenzialmente divisibile all'infinito.} Questo medesimo manifestano le opere sue , peroché come differente da tutte le cognoscitive virtù delli altri animali, come la irondine similmente nidifica, le ape similmente domificano {si fanno la casa (dal latino domus)}esso intelletto in ogni opera sua tanto varia quanto é quasi possibile, onde, volendo esemplificare di tutte le fortezze che nella mente occorrano continuamente, sarebbe uno processo in infinito. Ma assai sufficientemente secondo le mie debili forze reputo essere esemplificato a ciascuno di perspicace ingegno, peroché per li esempli posti a quelli sarà cosa facile, applicando, componendo e dividendo, componere di molte altre varie forme secondo che el sito richiedesse, non pretermittendo le regule generali e parti necessarie alla perfezione delle arce.{fortezze} Onde, oltre alle altre considerazioni che debbanno movere uno architetto, questa debba essere la prima e principale, cioè considerare di che loco et in che modo possi essere la rocca disegnata offesa, e pressupporre d'essere a quella inimico et avversario, e secondo li defetti applicare le medicine e remedi, et in questo modo operando, le nove con utile spesa fondare e le vecchie restaurare si porrà. Secondariamente è da considerare del minore numero di torri che la fortezza possono defendere, e quello edificare, rescando le cose superflue |S 42| e, più presto, parte della muraglia che se avesse a fare in due, mettisi in uno, per fuggire guardie e anco spesa. {e, per farla breve, per diminuire sentinelle e spese, si costruisca un muro solo al posto di due} Terzo, saria molto utile, e quasi necessario che l'architetto, overo chi vole pigliare frutto alcuno da questa mia piccola opera, intendesse qualche poco di disegno, peroché senza quelo non si può bene intendere le composizioni delle parti dell'architettura, et oltre a questo perché questa arte, oltre a la scienzia et intelligenzia acquista da libri e disegni, ha di bisogno di invenzione, senza la quale non è possibile essere bono architetto, perché molto cose, non potendosi descrivere né insegnare, bisogna restino nella discrezione e giudizio dell'artefice. Oltre a questo, quelli disegni che sono messi per esempli i ogni parte, non possono essere in tutto dichiarati, perché le superfice estrinseche coprono le intrinseche, {vuol dire che gli esempi non risultano sempre chiari (dichiaratti) perché nel disegno gli estreni (le superfice estrinseche) nascondono gli interni.} Onde non volendo multiplicare in infiniti esempli è necessario che, overamente le parti esteriori sieno imperfetto facendo perfette le interiori, overo per contrario et econoversamente. Adonque fa di bisogna supplire con lo ingegno alla scrttura e pittura. Ultimamente, perché come ho ditto la invenzione è necessaria a perfezione dell'arte, molti, avendo in la mente fabbricato un edificio con le sue conveniento proporzioni, non possono poi mettarlo in opera, non sapendolo né a sé né ad altri col disegno dimostrare. E queste condizioni osservando non serà difficile a ciascuno operare ragionevolmente."

or the mind of an uneducated man who cannot imagine any existence beyond the infinite sky. He elaborates that unlike "swallows that make their nest similarly or bees that make their house", the human mind has an infinite power to create different forms. He admits that had he wanted to demonstrate the fortresses that the mind can ceaselessly invent, he would have started an endless process. The repetition of *infinito* over ten times in those few lines demonstrates that Francesco's association of infinity and the power of human mind is not to be taken lightly. Similarly, his emphasis on the continuity of the mental act of creativity is once again a witness for his belief.

Francesco explains that based on his "weak forces" he has attempted to demonstrate examples of fortresses which demonstrate "shrewd creativity" (*perspicace ingegno*). Here again it becomes apparent that for him the drawings and the text explicating different types of fortresses are not solutions per se, rather they are models that indicate the rules and principles of the design. After having explained a few principles for how to design fortresses, Francesco declares that "…it would be very useful and necessary for the architect, who would want to reap any fruit from my little work, to understand drawing a little." He adds that without drawing it is not possible to understand well "the composition of the parts of architecture". This is only one of the many instances in which Francesco advocates having an active hand in drawing, and yet within the context of this paragraph, drawing's inherent connection to mind and its ability to put instances before the reader's eye have to be considered. In Francesco's words, drawing becomes a bridge that links the architect/writer's mind to the architect/reader's mind through the eye.

Francesco completes his argument by stating that in architecture "in addition to knowledge (*scienzia*) and intelligence acquired through books and drawings one needs invention, without which it is impossible to be a good architect." Francesco opens this passage by making architecture a process that starts in the mind, continues through drawing, and finds its cyclical resolution in that specific trait of the human mind: invention. He recognizes invention as the outermost characteristic which distinguishes the architect. He elaborates upon this notion by stating that in architecture "many things cannot be described nor taught, and should remain within the realm of the discretion (*discrezione*) and judgment (*giudizio*) of the artificer." While principles of judgment in the *Trattati* will be examined shortly, let us maintain that this passage strengthens the mental and inventive capabilities of an architect both as a vehicle for creation and one for applying value and judgment to the works thus created.

In the final part of this passage Francesco describes an issue that reveals his perplexity with

respect to drawing.[38] He emphasizes that the drawings made for each part are only examples, unable to clarify everything, because of the discrepancies existing between the inside and outside of a building. He emphasizes that "over the imperfect outer faces, the interior would be made perfect and vice versa." Francesco orders that one must supply his own creativity to drawing and text. He immediately adds that "invention is necessary to the perfection of the arts, as many people, who have built a building with convenient proportion in their mind, cannot then execute it, not knowing how to make it apparent either to themselves or to the others with drawings." Francesco's observations are not dissimilar to the discrepancies Alberti and Filarete have already identified between one's idea in the mind and its drawn form. The difference here is that Francesco proposes invention as the necessary wager which will be used in adjusting or reworking the aforementioned discrepancies to arrive at a perfect solution in architecture. Instead of complaining about such circumstances, Francesco celebrates them by hinting that it is in those instances that the architect's invention transforms the parameters of a project and moves them toward perfection. Summers refers to Francesco's insistence incorporeal nature of the human soul as the element that differentiates human and animal artifacts. Summers claims that Francesco's numerous drawings of the *Trattati*, which show "imagination linked with reason", are also to be understood as "the closest possible records of choice of theme and transformation by the artist", as they link "the inventiveness of the artist – and even of the artisan – to that of the poet.[39]

It is worthwhile to refer briefly to Manfredo Tafuri's last book, *Interpreting the Renaissance*, in which he refers to a similar process adopted by Francesco in his architectural projects.[40] Under the entry for Vettor Grimani's palace,[41] an unbuilt project drawn by Sansovino, Tafuri offers a parallel solution adopted by Francesco to cope with the common problem of irregular sites and points of junctions that could compromise the regularity of the building. Tafuri reminds us that for Francesco, as in his fortifications, and in a more pronounced way in the Cortile of the Palazzo Ducale in Gubbio, the perfection of geometric objects constitutes an ideal type that becomes available for distortion and inventive manipulation once it erupts into real space. Tafuri relates this discussion to a dialogue between *Virtu* and *Fortuna*. Tafuri states that Francesco assimilated the compromise

38 Onians, Bearers, 175. Onians describes this issue as something that Francesco was aware of and intended to resolve. This specific issue will be discussed in the following chapter when I discuss the form of drawing. Onians discusses Francesco's use of the "cutaway view", in which part of the exterior structure is removed to reveal the interior parts of the building.

39 Summers, Judgment, 214. Summers also refers to Giovanni Bellini, and Boccaccio, who each hint at notions of inventiveness in the same spirit. For more on the subject Cf. Summers, Michelangelo and the Language of Art (Princeton, NJ: Princeton University Press, 1981), 453.

40 Manfredo Tafuri, Interpreting the Renaissance, Princes, Cities, Architects, Trans. Daniel Sherer, (New Haven: Yale University Press, 2006).

41 Ibid., 224-225.

between the archetype and the exception, for which Tafuri adopts the term *accidens,* making it apparent instead of hiding it. An example is the trapezoidal shape of the Cortile, whose fourth side is closed, and whose differential corner and entrances are located on its short sides. To summarize, I believe that while in Francesco's qualification *ingegno* is an overarching talent and therefore general, invention is particular and applies to different problems that occur in the course of one's practice. By Francesco's standards, if an architect is talented or creative, he/she can conceive of ideas and design; and if and architect is inventive, he/she will be able to change, transform, and adjust specific conditions to general rules.

In the conclusion of T2, in a passage that shares many similarities with that discussed above, Francesco reiterates his thoughts on invention.[42] He states that the mind of mortals is "perpetual and incorruptible" and can show "infinite virtue". In describing the range of activities covered by such an incorruptible mind, Francesco enumerates the virtues of that mind: "it knows infinite time in which it has a desire to linger infinitely, considers infinite numbers to every finite addition, bears in mind many figures of infinite angles dividing the body and every infinite quantity, imagines an infinite endless body; for neither learned nor ignorant can comprehend that nothing lies above the ultimate sky and that what is not coerce and conscript in any corporeal grandness, in fact, as to its operation, has not the virtue of the body but of the incorporeal." As is apparent in this formulation, the range of activities ranges from mathematics, to drawing, to imagination. Once again we observe the proximity of invention as a form of cognition that is coupled with the innate ability of *ingegno* to achieve an endless series of inventions. By taking up the example of animals that show a natural virtue in building their abodes, once again, he advocates the power of mind as a boundless force free of limitations. Francesco himself uses such necessary elements as *ars* (which includes the sayings of antiquity), the remains of past buildings, and one's imagination.

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42 Di Giorgio, Trattati, T2, Conclusione, 505. "|M98v| La mente de'mortali come perpetua et incorruttibile, in certo modo essare di infinta virtù ci dimostra, perché cognosce il tempo infinito come per quello appetisce di rimanere, considera numero infinito ad ogni finito agognendo {aggiungendo}, intende infinite figure come infiniti possano essar li anguli, unde che'l corp<o> et ogni quantità infinito si può dividare, immagina corpo infinito senza termini come appare manifestissim perché li dotti et ignari non possano comprendere sopra alla ultima spera essar nulla come quello che non è coartata e coscritta in alcuna grandezza corporea, anzi , quanto alla sua operazione, non è virtù del corpo ma incorporea e sperata benché sia forma di corpo, come c'insegna Aristotile nel terzo dell'anima. Questo medesimo le opere sue ci dimostrano, però che tutti li altri animali operando naturalemente sempre ad uno modo operano, come similmente ogni irondine nidifica e similmente ogni ape overo aranea {rango} domifica, ma nell'intelletto umano essendo l'arte con la forza assegnata {avendo l'arte il potere sopra descritto}, tutte le opare sue, le quali sono quasi infinite, infinito varia. Onde volendo esemplificare di tutti l'instrumenti che nella mente occorrano, saria un processo infinito. Sieno adunque a suffizienzia li esempli descritti alli ingegnosi lettori perché facil cosa è a le invenzioni agiognare {giungere, arrivare} applicando i remedii sicondo i difetti, restando {lasciando} le superfluità e non mancando nelle necessarie cose."

Referring to Aristotle's *De Anima*, Francesco discusses the manner in which animals operate, citing again swallows and bees. In contrast, Francesco claims that "as art in the human intellect has the power mentioned above, all his works, which are almost infinite, vary infinitely". He confesses that to demonstrate all that occurs in one's mind requires "an infinite process". Francesco refers to the drawings of the *Trattati* as examples that would be "sufficient for ingenious readers (*ingegnosi lettori*) because it is an easy thing to arrive at inventions by applying remedies to defects, leaving out the superfluous and not missing the necessary things."

The relation between invention and infinity, or the infinite power of mind to invent novel and marvelous things, has been elaborated by Martin Kemp in an article dealing with invention, imitation, and fantasy.[43] We can see that in Francesco's terms the need for perpetual invention stems from the nature of the human mind, since it is an incorruptible entity related to divine virtue and thus insatiable in its perpetual quest to invent. The human mind's abilities are juxtaposed to those of animals, which operate according to constant patterns and never depart from their natural modes. Kemp associates the nature of invention with *dottrina* as a method of excogitation. In that light Kemp evaluates Alberti's emphasis on the interaction of man's innate judgment with the fundamental design of nature as a predominantly "scientific" form of invention.[44] Kemp suggests that Alberti, Manetti, and Francesco acknowledged a freer, open power of invention in architecture, in contrast to the predominantly scientific form of invention. In Kemp's opinion, even though associations of invention, *ingegno*, diligence, and skill were common in the minds of Brunelleschi and Alberti, it was Francesco who offered the most novel description of the notion of invention by transcending the position of Alberti, or for that matter also their mutual reference, Vitruvius. Kemp calls Francesco's interpretation "the most deeply considered and philosophically astute" notion of invention. [45]

In pointing to Francesco's mention of the human mind's movement towards natural philosophy and a predilection for metaphysics, faithful to Aristotelian philosophy, Kemp suggests that Francesco's basis of knowledge provides a foundation for the architect's activities and assigns a prominent place to *scienzia* as a prerequisite for good design.[46] He claims that Francesco's deliberate

43 Kemp, Mimesis, 347-398.
44 Ibid., 349. The use of the word scientific calls for some reflection. I believe Kemp's emphasis on a scientific notion of invention stems from an attempt to liken such invention to that of "scientific discovery" which is presumably an act of creating ex-nihilo. However as he refers to the accounts of Alberti, Brunelleschi and Francesco, it becomes clear that invention for the Renaissance architects is far distanced from our contemporary perception of it, and therefore the term scientific is to be taken more advisedly.
45 Ibid., 351.
46 Related to what was discussed in footnote 44, I believe the term *scienzia* is one that needs further

putting of architecture in the context of cosmological knowledge is much more explicit than the works of Alberti or Vitruvius and consequently more successful in its attempt to raise the status of architecture among the arts. Kemp then sets out to describe Francesco's retelling of the Vitruvian story of Dinocrates, arguing that only his version develops the story in terms of macrocosm and microcosm. He claims that Francesco's version of this story creates three levels of analogy between the body of the earth, the body of man, and the form of the city. Kemp argues that although Francesco's philosophical concepts seem naïve and eclectic, his philosophy of the arts has genuine originality.

On the other hand, Summers traces back Francesco's thoughts to those of St. Thomas Aquinas, who "distinguished human imagination from animal estimation and human from animal art." [47] According to Summers, Aquinas distinguishes between "natural and rational virtues." He refers to a passage in Aquinas's *De virtutibus in communi*[48]: "Man however is capable of many and diverse operations, and this on account of the nobility of his active principle that is, his soul, the virtue of which extends to infinity." He suggests that in the context of the Renaissance, Aquinas was interpreted in understanding that "the inventive power of the mind was based in reason, as indeed it was a power peculiar to the soul."[49]

Since we have already considered *ingegno* and *inventio*, it is time to look at *fantasia* in the *Trattati* and locate how and when the term is used. Francesco does not extensively use *fantasia*; rather he uses the terms *imaginazione* and *imaginare* to describe the initial phase in which architecture is conceived. His most significant use of *imaginazione*, as we have seen earlier, is to typify architecture as a "subtle imagination conceived in the mind." Looking at the etymological[50] meanings of *fantasia*, we can

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elaboration. It is clear that Francesco insists on learning the different branches that feed into architecture and therefore argues for attaining the *scienzia*, or the knowledge that is part of the architect's learning process. As discussed earlier in referring to Baxandall's notion of *ars et ingenium*, *scienzia* or *scientia* is understood as the combination of the two, and means knowledge, not to be mistaken with our modern sense of the word science. However it is crucial to remind ourselves that as a maker, Francesco is also living in an alchemical world, within which there are no precise boundaries between knowledge and creativity.

47 Summers, Judgment, 213-14.

48 Thomas Aquinas, *De virtutibus in communi*, q. 1, a 6 Opera Omnia (Parma: P. Fiaccadori, 1852-73),VIII, 557.

49 Summers, Judgement, 213-214.

50 http://www.etimo.it. 01/04/2010. **Fantasia** dal gr. PANTASÌA apparizione, immagine (specialm. *pomposa*), da PHANTAZÔ *faccio apparire ed anche mostro pomposamente*, che sorge dalla radice di PHANÍNO *presento alla vista*, ond'anche PHANÓS *luce*, PHANTÓS *visibile* (v. *Fama*)— Potenza immaginativa e rappresentativa dell'anima; ed anche Immagine, Invenzione, Pensiero, Idea e sim. —«Uscir di fantasia alcuna cosa»—In modo particolare dicesi « Non mi romper la fantasia», che tanto è come dire Non mi romper il capo, Non m'Importunare, cioè Non mi deviare dal mio pensiero./ Negli atti degli apostoli è adoperato per Fasto, Pompa, Arroganza, ed in alcuni padri della chiesa per Finta immagine di cose, Inganno del demonio./ *Fantasia* in cattivo sense diferisce da Capriccio, Che è più indocile, più cieco e viene piuttosto dal carattere e da inclinazione viziosa, mentre quella proviene da un sentimento istantaneo e passeggiero; da *Ghiribizzo* che è un capricio, che ha dello strano più che

observe that *fantasia* is essentially the power of the mind to imagine and conceive images, inventions, or ideas. It is possible that *fantasia* can also refer to drawing, because *fantasi*a is always followed by some mention of drawings, thus making the two acts almost inseparable.

Prior to examining Francesco's references to imagination, it is necessary to give an overview of the philosophical background of the term 'imagination' and introduce the major tenets of the term in its Aristotelian formulation. Following Onians' identification of Aristotle's as Francesco's guide, similar to the role of Cicero for Alberti, and Palto for Filarete; Francesco's notion of imagination is not complete unless it is connected to its Aristotelian basis. Onians confirms that Aristotle's philosophies "became the basic method"[51], with which Francesco built his theories. Aristotle's influence is to be found, both in terms of content and method, in a variety of places in the *Trattati.* However, before we turn to evidence of this with specific reference to Francesco's own thoughts on imagination, a contextual elaboration is in order.

Richard Kearney's *The Wake of imagination*[52] traces the path of understanding imagination in light of the western philosophical tradition. Concerning the Greco-Roman tradition, Kearney starts with the Promethean myth, and then expands on Plato's formulation of imagination, which he qualifies as a metaphysical understanding of this phenomenon. My intention here is to refer to his writings about Aristotle, as Aristotle's thoughts influenced Francesco's theories. Kearney suggests that Aristotle's contribution to the understanding of imagination shifted the locus of investigation from a metaphysical understanding to a psychological one. Kearney postulates that Aristotle emphasizes the role of image as "a mental intermediary between sensation and reason rather than as an idolatrous imitation of a divine demiurge."[53] By referring to Aristotle's formulation of mimesis Kearney suggests that unlike Plato, Aristotle recognizes a positive value in poetic imitation as one that "fosters truth rather than falsehood, which deals in essences rather than appearances".[54] Kearney argues that unlike the Platonic trend which associates the image with external world (in tandem with *eidolon* and *eikon*), Aristotle focuses on the notion of image as a mental representation (*phantasma*). The outcome of this internalization thus results in imagination being "an internal activity of the mind

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del malizioso; da Grillo, che familarmente esprime un capricetto di poca importanza; da fantasticheria, che ha un senso più basso ed è propria degli spiriti piccoli e ristretti. /Deriv. *Fantasiàre*, [= *Fantasticàre*]; *fantastióso; fantasiúccia; fantàstico.* Cfr. *Fantasma*

51 Onians, Bearers, 178.

52 Richard Kearney, The Wake of Imagination Toward a Postmodern Culture (Minneapolis: University of Minnesota Press, 1988).

53 Ibid., 106.

54 Ibid.

which mediates between sensation and reason."[55] Kearney suggests that Aristotle's attitude transforms the image as both "a window to the world and a mirror in the mind."[56]In the same guise Kearney points to Aristotle's rejection of Plato's understanding of images we see in our dreams and reveries as implanted by God and offers that for Aristotle, these images stem from our 'sensible experience'. Rather than identifying images as instilled by gods, Aristotle recognizes the source of our images as memory. Aristotle defines memory as "a reservoir of images which record our sensory impressions of reality"[57], and locates it at the same part of the soul that imagination is emanating from.[58]

Referring to *De Anima,* Kearney states that Aristotle understands imagination as "an intermediary faculty between our sensible and rational experiences." Following from the philosopher's claim that "Phantasia differs from both perception and thought even though it cannot exist without perception and serves as a precondition of belief" (*De Anima* 3, 3, 427 b.), Kearney suggests that for Aristotle, the process of thinking is coupled with an image: "Every time one thinks one must at the same time contemplate an image."[59] In a similar passage in *De Memoria,* Aristotle likens the process of imagination as an act for image-representation to drawing "…We stated that it was not possible to think without an image (*aneu phantasmatos*); because it is the same thing to think and to draw (*diagrapheim*)."[60] Kearney believes that such an analogy between drawing and imagination makes imagination "the inner draughtsman of the mind."[61] He suggests that Aristotle's postulation, which departs from the platonic mode of thinking, fortifies imagination as a painted image as one that is internal to the soul and a crucial device of memory.[62]

Kearney explains that Aristotle corroborates the platonic understanding of imagination within the bounds of movement, desire and time, and yet augments its impact. Referring to Aristotle's formulation that the image "is movement based on a sensation…."[63], Kearney describes imagination in the psychological sense as a movement mediating between the potency and the act,

55 Ibid.
56 Ibid., 107.
57 Aristotle, De Memoria., 451.
58 Ibid., 450 a.
59 Aristotle, De Anima, 432 a.
60 Aristotle, De Memoria., 449 b-450.
61 Kearny, Wake, 108.
62 Ibid. 108-109. In summarizing the difference between the Aristotelian and the Platonic understanding of imagination as what he calls a 'picturing activity', Kearney suggests that for Aristotle imagination is moved to the domain of psychology, as an internal mode of picturing; and that it finds its place as a precondition to rational thought, and therefore opposite to Plato's banning of images from the faculty of reason; and lastly, for Aristotle's its connection to our sensory experience facilitates and prepare the ground for our comprehension of truth.
63 Aristotle, De Anima, 428 b.

"from sensation to cognition, from lack to fulfillment"[64]. By linking desire to imagination, Aristotle postulates that "when the imagination moves it does not move without desire." Hence, Kearney describes that for Aristotle, imagination "communicates desire from the material realm of appetite to the mental realm of our intelligence."[65] In tending to imaginations' relation to time, Kearney frames Aristotle's view of imagination as temporal as it allows us to remember things from the past and foresee our experience of the future. Kearney suggests that the possibility of imagination going forward in time in anticipating the future suggests the image has a potential to "move beyond the given sensible experience of our past in order to prefigure possible modes of experience."[66]

Kearney claims that Aristotle distinguishes two different types of imaginations: sensible imagination (*phantasia aisthetike*) and rational imagination (*phantasia logistike/bouleutike*). He states that while Aristotle recognizes the sensible imagination as shared between animals and human beings, the rational imagination is primarily the domain of humans. Kearney describes that while the sensible imagination refers "exclusively to our empirical appetites", the rational imagination is "capable in uniting and combining our empirical sensations in term of a 'common sense' which is in turn representable to reason."[67]

Kearney reminds us that for Aristotle, similar to Plato, productive imagination should not be taken as an entirely productive power; as such a concept in Western philosophy was only the outcome of Kant and the German idealists who argued for imagination to be fully detached and autonomous from both sensation and reason. Kearney defines the Aristotelian view of imagination by identifying *phantasia* as an intermediary between sensation and reason, as "it owes both its mode of existence (at a metaphysical level) and of truth (at an epistemological level) to either sensation or reason or both."[68] This brief review of Aristotelian principles is both useful and necessary as it will shed some light on Francesco's understanding of imagination.

In the *Trattati*, while describing different forms of fortresses, Francesco refers to imagination and fantasy in the following passage.[69] Since "wishing to describe all that belongs to this faculty [of

64 Kearney, Wake, 110.
65 Aristotle, De Anima, 433-444.
66 Kearney, Wake, 110-111.
67 Aristotle, De Memoria, 450a.
68 Ibid., 112.
69 Di Giorgio, Trattati, T1, Ponti di Fortezze e Altri Tipi di Difese, 19. "|...T 6v|E perché volendo descrivare tutto quello che en tale facultà s'appartiene sarebbe quasi impossibile, e faccendo infinita a raccontare molte diverse e strane fantasie le quali sicondo luoghi e siti adattar bisogno, ed anco perché assai son quelle che la lingua o penna sprimer {esprimere} non lo può, le quali lo inteletto cogitando vede, ma solo è da pigliare el suggetto delle cose le quali l'architetto con ragione componendo aggiognare e diminuire può.Ed essendo in esse

imagination] would be nearly impossible", and its products are "varied, strange and in need of adjusting to diverse places and sites", and also there are many of them that "the tongue or pen cannot express", Francesco decides to discuss only those that the architect's reason may understand. These examples can be modified later depending on the location and site. He also confesses that in the case of fortifications "the design of an exterior outline does not necessarily reveal the hidden parts", which are nevertheless part of the project (the product of fantasia) and must be shown by means of additional drawings.

The following passage in T1 is of interest since it directly refers to Francesco's own *fantasie*. It is not accidental that the two adjectives accompanying *fantasia* are *diverse* (diverse) and *strane* (strange). If we look at these qualifications, it becomes clear that *fantasia* is untamed, boundless and burgeoning with strange and diverse ideas, anxious to give birth to nascent visions and images. Francesco also refers to the fact that those fantasies need to be "adjusted" based on the specificity of each project, and claims that there are even some that are not describable in any tangible form. He then uses *lo inteletto cogitando vede*, which needs some explanation. The endless stream of imagination is only visible to the eyes of the thinking intellect. Aside from the literary beauty of this composite fragment, the series of words encapsulates Francesco's idea about the primacy of sight and the fact that sight governs our intellect. That our intellect thinks by seeing, or sees while thinking, is at the core of the process of transferring *fantasia* to a format that is comprehensible both to the author as a way to further the process of *disegno*, or as a way to share his fruits of imagination with others.

The passage that serves as the conclusion of T2 authoritatively reveals Francesco's mature thoughts centered on the themes of *ingegno*, *inventio*, *fantasia*, and ultimately *disegno*.[70] As this passage

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due contrarietà le quali difficilmente dimostrar si possano, l'una è per iscritto molte diversità di forme{doppo forme in L e aggiunto mostrare}, l'altra è per propra figura e disegno. E massime di quelle che l'una all'altra coprendo se medesme occulte fanno.{e ciò accade in modo particolare nelle forme (di fortezze) di cui il disegno (per esempio di un prospetto esterno) deve necessariamente lasciar nascoste parti essenziali (come l'interno o il prospetto opposto) } delle quali {di queste} brevemente alcuna mostraremo."

70Ibid., T2, Conclusione, 505-6. "|M98v-99|Uno documento ultimamente non è da permettare al quale dieno avere avvertenzia quelli che di questa mia operata desiderano consequire alcuno frutto, e questo è che questi tali s'ingeg<n>ino avere qualche intelligenzia del disegno, perché senza quello non si può bene intendare le composizioni e parti dell'architettura perché le superficie esteriori comprano {errore per coprono} le interiori e d'ogni parte longo saria dare esempli, e perché il completo architetto richiede la invenzione per molti casi occurenti indescritti che senza disegno è impossibile consequire, e perché non possendo ogni minima parte dichiarare, quelle che restano <sonno> nella discrezione dell'architetto, la quale senza antegrafice è nulla e molto volte manca in quello ancora dove si intende. E ultimamente, come nel principio è ditto, dato che alcuno nella fantasia avesse |M 99| ordinato alcuno raggionevole edifizio o vero instrumento, volendo quello fare comparare e fabbricare, non può senza il disegno esprimare e dichiarare el concetto suo; questa parte consequendo, non sarà difficile con questi pocchi descriti principi venire a notizia di più vere conclusioni e ragionevolmente operare con l'aiuto del fattore del tutto {Iddio} da cui tutte le virtu sono conocesse."

encapsulates all the themes that were described earlier, I have included it in its entirety:

> "This work is ultimately not a set of instructions to permit those who desire it to acquire the fruits of my humble work; rather it is for those who think (*s'ingegnino)* and have some intelligence/perspicacity in *disegno;* without which, one could not understand compositions and parts of architecture, for the exterior surfaces hide the interior ones; of each part I have given ample examples, and because the complete architect must invent in many unforeseen circumstances, it would be impossible to achieve that without *disegno;* and because I can't clarify every minimal part; those are left to the discretion of the architect, whom without *antigrafice* is nothing and frequently lacks in the latter even when it is expanded. Ultimately as it is said in principle, granted that one had anything in *fantasia*, and had ordered every reasonable edifice or real instrument, and been wanting to compose and make, [he] cannot without *disegno* express himself and clarify his concept. This part achieved, it won't be difficult with these few principles to arrive at the most real conclusions and to operate reasonably with the help of God, from whom all virtues emanate."

Once again Francesco qualifies *ingegno* as the primary condition without which one would not be justified in using the book. He then emphasizes the importance of possessing intelligence if one aspires to draw, and doubly confirms it by an insistence on *antegraficie*. Once armed with intelligence in drawing and the innate ability of *ingegno*, one is fit to realize any *fantasia* of one's own, implicitly underlining the infinite ability of the mind to dream, to draw, and to make works of architecture. In sum, I hope that the above paragraphs, referring to passages in the *Trattati* that cover notions of creativity, invention, and imagination, have made one thing apparent. As if each of the notions was a thread in the project of architecture, Francesco intertwines them so that each becomes essential to the process of conceiving drawings. The fabric of the drawing is woven of the threads of creativity, invention, and imagination. This is Francesco's singularity among his contemporaries: no other theoretician, architect or humanist at that time so exclusively related these elements to the act of drawing.

PRINCIPLES OF JUGEMENT: *GIUDIZIO,* SIGHT AND (ERRONEOUS) INTELLECT

Having examined the vocabulary concerning the creation of *disegno*, we can turn to Francesco's discussion of its judgment: the criteria on which *disegno* might be deemed right and appropriate. It is important to note that in the earlier passages selected from the *Trattati* we saw that the term *giudizio*,

often accompanied by *discrezione,* implies that *giudizio* is another ability of the mind which, similar to *ingegno*, belongs to man's cognitive capacity. Another term concerning judgment is *sottilità* or *sottile*, which would be translated as "subtlety", or "subtle". In the pages which follow each of these words is contextualized.

One example of such use appears in a passage about fortresses in T1, where *giudizio* and *discrezione* are coupled.[71] Francesco first warns the architect, or any other reader of his *Trattati,* that in order to be able to profit from his book, " it will be very useful and almost necessary….to know drawing" as without drawing it will be impossible to understand how the "compositions of the parts of architecture" are made. Francesco further clarifies that in addition to "science (*scienzia*) and intelligence acquired through books and drawings, there is need for invention." He argues that it would be impossible to "be a good architect without invention" as there will be many things that could neither "be described nor taught" since they depend on the "discretion (*discrezione*) and the judgment (*giudizio*) of the architect." While here Francesco does not describe explicitly the nature of either judgment or discretion, this passage – which begins so clearly with an emphasis on drawing – implicitly relates judgment to conception and to the inventive adjustment of the architect's solutions negotiated through drawing.

It is important to also point to another term appearing in the *Trattati* and associated with judgment: *sottilità*[72], or *sottile,* which I would translate as cunning intelligence for the reason described below. In Francesco's formulation of architecture as *"un sottile imaginazione"* the term *sottile*, *sottilità* has also to be elaborated upon. Francesco replaces the Latin tem *sollertia* with *sottilità* in his translation of Vitruvius. The first paragraph of Vitruvius's *De Architectura* becomes in Francesco's translation: "*Raciocinatio e demostrare, ed esprichare le cohose innanzi che le fabrichate sieno chon propositione di sotilita e ragione.*"[73] Recalling Francesco's theory describing architecture as a "subtle imagination", one must bear in mind that this so-called subtlety is in fact cunning intelligence, an intelligence which keeps the imagination in check. This pairing conveys a dimension of reason and practicability to the creative process; it distances imagination from the more dreamlike wanderings of the mind and brings it closer to reason. Although Francesco's use of *sottilità* is perhaps directly aligned with the Vitruvian

71 Ibid., T1, Forme di Rocche e Fortezze, 483. "|S 42| Terzo, saria molto utile, e quasi necessario che l'architetto, overo chi vole pigliare frutto alcuno da questa mia piccola opera, intendesse qualche poco di disegno, peroché senza quelo non si può bene intendere le composizioni delle parti dell'architettura, et oltre a questo perché questa arte, oltre a la scienzia et intelligenzia acquista da libri e disegni, ha di bisogno di invenzione, senza la quale non è possibile essere bono architetto, perché molto cose, non potendosi descrivere né insegnare, bisogna restino nella discrezione e giudizio dell'artefice.
72 In Francesco's *Volgare*, *Sottilità* is spelled with one t, however the current Italian spelling is used here.
73 Scaglia, Vitruvio, 75.

concept, it is worthwhile to refer briefly to a passage in Summers' *Judgment of the Sense* in which he discusses *ingenium* and *subtilitas* together.

Summers argues that for medieval scholars *ingenium* could also be understood as "those characteristics of works attributable to the innate differences of one artist from others."[74] In light of our discussion of judgment, we need to refer to Summers' view of Avicenna's notion of *ingenium*. He argues that for Avicenna, *ingenium* is "the point of contact between the material and agent intellect" connected to what Aristotle calls the "*actus rationis*", the ability to come up with middle terms. Summers explains that Avicenna might have intended that *ingenium* becomes the ability to perceive "what is right by a kind of illumination." Summers claims that *ingenium*, being based on individual difference, allows one to discover middle terms according to his/her talent. This Aristotelian ability was referred to as *sollertia* by Boethius[75] and was defined as *quaedam subtilitus*.[76] Summers explains that "the difference in material intellect owes to differences in *subtilitas*" and the subtlety in question is "the subtlety of the corporeal substrate of intelligence, just as such differences accounted for individual differences in intelligence in Aristotle."[77] This *subtilitas*, often translated as *sottilità,* found its way into Francesco's theory and took the place of Vitruvius' *sollertia* or cunning intelligence. It is possible that Francesco's use of the tem *sottilità* is removed from connotations specific to Avicenna (or Boethius for that matter). However, it is also important to point out that Summers' argument demonstrates that *sottilità*, originally stemming from *ingegno*, is innate and based on individual taste.

Francesco does not elaborate on the nature of judgment or the discretion of the architect extensively. In keeping with his discussions of creativity/talent (*ingegno)*, judgment (*giudizio)* can be understood as the soul sister of *ingegno*, similar to *ingegno* in its emanation from one's intellect and associated with reason. Likewise, *discrezione*, closely aligned with the freedom of *invention*, allows for a day-to-day, case-by-case judgment applied to architectural subjects. In other words, *giudizio*, like *ingegno*, is innate and connected to our intellect and through it to the divine, partaking of eternal time; *discrezione*, like *inventio,* is linked to the temporal and thus applies to a more personal sense of taste and preference. Ultimately, *sottilità* (the Vitruvian "cunning intelligence") is associated with fantasy and imagination. The boundaries of the three terms appear to be to a certain extent mobile.

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74 Summers, Judgment, 99, 99 (39)
75 Jacques-Paul Migne, Ed.., Patrologiae cursus completes...series latina, 221 vols., (Paris: Apud Garnier, 1844-96), vol. 64, col. 744.
76 Summers suggests that Grosseteste identifies the same ability as one based on mental sight and its penetration into matters. He offers that this subtlety derives from the power of such sight. CF. Summers, Judgment, 99, 99 (39).
77 Ibid.

Francesco does not specifically explain what measures should be used to assess work beyond the general category of "judgment". However a passage on fortresses in T2, in which Francesco describes the source of our knowledge, comes close to identifying the criteria of judgment.[78] He postulates that the basis of our knowledge is our "intellect", which itself has "its origin in sense." Francesco relates his opinion to that of Aristotle's views – referring in particular to *Posteriora*, (The second part of *Analitici)*, the second and third parts of *Dell'anima*, and the first part of *Metaphysics.*[79] He thus reiterates that among the senses, "sight is more spiritual, pure, and perfect, and it shows us many things and many differences." Francesco confirms that without sight, our intellect could not "understand anything or take anything in for a long time", as sight "elevates our intellect to know the prime cause." He explains that this is the primary reason that when philosophers and *calculatori* who want to demonstrate the value of certain quantities, "speak of it as if it were a line or any other visible and continuous quantity." Francesco then warns that even a perfect memory cannot situate all things but briefly, in order and through frequent meditation. He confirms that in addition to all the "general and special rules, it is necessary for greater perfection and lucid information to give examples in drawings" for the fortresses. Drawings "guide the intellect better and with more firmness maintain the method of building than general words."

In the above passage there is no direct link to judgment; however, a few themes emerge that are implicitly related to judgment. First, by emphasizing the role of the sight as the most prominent sense, Francesco defines the locus of judgment as primarily visual. He declares that knowledge, which emanates from our intellect, is in turn governed by the senses and particularly by sight.

78 Di Giorgio, Trattati, T2, Forme di Rocche e Fortezze, 444-5 "|M 56 v| Perché ogni nostra [cognizione] notizia dello intelletto ha origine dal senso, come testifica Aristotele [in] nel primo della Posteriora {i secondi Analitici} e enl secondo e terza dell'Anima, et in fra [tutti] li altri sensi [esteriori] el vedere è più spirituale, puro e perfetto, e più cose e differenzie ci dimostra [, come scrive nel primo della Metafisica],{In realtà è l'ultimo che contenga concetti molto vicni anche nella forma e quelli espressi da F. di G. Né negli Analitici, né nell' Anima si hanno infatti affirmazioni cosi esplicite.}, non pare che lo inteletto nostro così possi [perfettamente] comprendere alcuna cosa né longo tempo tenere, se quella col senso del vedere non ha conosciuto, o almeno [qualcuna altra] |M57|cosa simile a quella, per [la] cui cognizione l'intelleto si eleva a conoscere la prima. E da questo procede che li filosofi o calculatori volendo trattare delle qualità intense, {In realtà qui F. di G. Allude alla possibilità di visualizzare i valori quantitativi di determinate qualità intense (peso, calore, velocità etc.) mediante linee o altri elementi figurali apprezzabili visivamente} di quelle parlano come se fusse una linea et una qunatità visibile, e, continuo, {inoltre} per questo ancora la memoria si fa perfetta, locando le cose considerate d'un modo che in quella sola non si confidi ma nella brevità, ordine e frequente meditazone. Onde, oltre a tutte le generali e speziali regule, [di sopra dichiarte del modo dello edificare le fortezze], è necessario a maggiore perfezione e chiara notizia ponere alcuni esempli in disegno [con modi più particilari], per li quali meglio lo intelletto giudichi e con più |S27 v| fermezza ritenghi [el modo dello edificare], però che [comune opinione è che] li esempli più movino l'inteletto che le parole geenrali, massime quale que non sono molto esperti et eruditi. {In M il testo è qui molto diverso e di significato curiosamente contrario: massimamente li omini esperti e li non molto esperti. È probabile che al momento della stesura di M temesse di trare qualche suscettibilità e perciò si capovolgesse il senso del discorso affermando in sostanza che gli esempi figurati so no comprensibili a tutti, sia asi non esperti, sia agli esperti, ai quali poi sono comprensibilissimi."

79 Ibid., 445(1). Maltese states that Francesco's references to Aristotle's works are not always correct.

Second, Francesco does not fail to remind the readers that in tandem with the primacy of sight, there is need for drawings to achieve "greater perfection and lucid information." As drawings better carry within themselves modes of building, they lend legitimacy to the design process, therefore they enable the intellect is able to better judge. In addition to a general inclination for the centrality of sight, the above-mentioned passage reveals Francesco's clear and definitive call for the act of drawing, as one that bestows superiority, accuracy, and ultimately certainty to the design process. Consequently implying that judgment of architectural works will be facilitated through the examination of drawing.

On a more tangential note, in continuity with his belief that our intellect is governed by our sense of sight, Francesco further confirms that it would be difficult for us to understand anything or, more importantly, remember anything without the sense of sight. He relates our ability to see to our ability to remember, thus relating it to *fantasia* and *phantasma;* and he tells us that our intellect cannot function without sight. He makes a case for the simultaneous performance of *ingegno* and *invention* and extends the argument to say that it would be impossible for readers to understand well without having something before their eyes. Further, he confirms that an abundance and variety of drawings are necessary to fulfill his intentions.

A less philosophical passage in T1 offers another example of Francesco's elucidation of such matters, demonstrating that such thoughts were present in his mind since the earlier composition of T1.[80] It must be noted that the passage primarily concerns the reason and methods of safeguarding the fortress; the contents are only obliquely related to judgment. Although the passage lacks the eloquence and more encompassing worldview of T2, it is noteworthy in that it presents similar notions; in this case by drawing an analogy between a man and a fortress. Francesco states that most important to the city is "the defense and preservation of it." He suggests that this concept is very similar to nature's demonstration that "the head and the face of the human being's body are its more noble organs, and that [man] sees everything and guides the body with his eyes; thus the fortress is to be in a prominent position in order to guide and see all the body of the city and be able to see everything." Here, he advocates the primacy of sight in guiding both the body and the intellect of

80 Ibid., T1, Fortezze, 3. "|...T3|...e massime nella città e defensione e conservazione d'essa; cosi la natura avendo mostro a loro el capo e faccia del corpo umano essere el più nobile membro d'esso, e che cogli occhi visivi tuttto el corpo giudicar debba, cosi la fortezza di<a> essere posta in luogo eminente che tutto el corpo della città giudicare e veder possa. Adunque la rocca de'essere principale membro del corpo della città, siccome el capo è principal membro di tutto el corpo. E come perso quello perso el corpo, così perso la fortezza persa la citta da essa signoreggiata. Adunque con diligente cura essa guardare si debba, e dia essere in tal modo composta e ordenata che non senza grande industria di sottilità di ingegno, forza, o furtivamente perdare si possi."

man and likens such ability to that of a fortress, in which the *rocca* acts as the eye of the fortress. The strategic location of the head, as the most noble part of the body, and the eye, as the most noble part of the head, are emphasized by confirming that the eyes guide the body and dictate its actions. Francesco's assertion here that sight is the faculty that allows the intellect to judge is similar to the content of the passage we discussed in the above paragraph in T2. He concludes that if the fortress is to be guarded with diligent care, it should also be "composed and ordered such that it cannot be lost furtively or without an industrious and the subtle creativity (*grande industira di sottilità di ingegno*)."

It would be tempting to conclude that as for Francesco sight is the most noble of the senses; it also becomes the ultimate measure for making judgment. However, despite Francesco's occularocentric bias, the following passage presents another point that should not be underestimated. In T1, in the same chapter on fortresses, Francesco makes allusion to the mind's eye.[81] He argues: "And since we see that man has two eyes with which he sees and becomes aware of the perceptible things, and he has visual eyes, he should also have mental eyes, which are the guide via the intellect to judge and know the future things." Just as one's eyes give knowledge about the perceptible, one's mental eyes allow one to *giudicare* (judge) and *conosciere* (know) things. The pairing of judgment and awareness suggests an Aristotelian bias that favours the primacy of our senses, specifically that of sight. Yet, this passage's allusion to the mind's eyes suggests that in addition to sight, other elements should be factored in the process of design and judgment.[82] The other interesting point is Francesco's allusion to the ability of the eyes (corporeal or abstract) to anticipate the future. This allusion reminds us of the ability to imagine and leads us to see that the presence of fantasia is sensed through Francesco's words, linking insight and foresight to the process of judgment.

It would be appropriate to take a moment and look at what Vitruvius[83] has to say about the senses and their errors. Discussing judgment and sight, he talks about the flaws that could be caused

81 Ibid., T1, Fortezze, 3-4. "|...T3|E Siccome noi vediamo che l'uomo ha due occhi co'quali vede e conosce le cose apparenti, così come ha gli occhi visivi debba avere li occhi mentali, I quail sieno guida e via d'intelletto di giudicare e conosciare le future cose. Imperò, se vede e cognosce incorrire il corpo in qualche piccolo o grave infirmità, a essa presto riparar si debba, e se non per sé, coll'aiuto e consigli del fisico[medico], imperò che noi vediamo una piccolo ferita mal curate spesso divenire mortale, e così per contrario una grande e grave con sollecita e diligente cura spesso sanarsi. Così el governatore e rettore della città continua vigilanzia considerare e vedere se la città incorrisse in alcuno mancamento, o grave o non, a esso subito ripar debba con quelli argomenti che necessario sieno."

82 In Judgment, Summers refers to the third book of Aristotle's *De Anima*, in which he discusses the internal sense, closely associated with Aristotle's notion of common sense, and part of the broad umbrella of sensation. Summers explains that the inner senses were somewhere between sensation and the intellect, and included "common sense in some relation to fantasy, fantasy in some relation to cogitation, estimation and memory." I believe Francesco's interest in the outer and the inner eyes is therefore more complex, and different from a post 19th century notions of sight.

83 Vitruvius, Ten Books, Hicky Morgan Edition, Book VI, II. 2.

by sight and how they could be remedied once the architect is aware of them. Here we can see that the discussion is primarily centered on sight and both problem and solution are located in the same sense. In book VI, Vitruvius states that "The look of a building when seen close at hand is one thing, on a height it is another, not the same in an enclosed place, still different in the open, and in all these cases it takes much judgment (*iudicium*) to decide what is to be done. The fact is that the eye does not always give a true impression, but very often leads the mind to form a false judgment. In painted scenery, for example, columns may appear to jut out, mutules to project, and statues to be standing in the foreground, although the picture is of course perfectly flat. Similarly with ships, the oars when under the water are straight; though to the eye they appear to be broken. To the point where they touch the surface of the sea they look straight, as indeed they are, but when dipped under the water they emit from their bodies undulating images which come swimming up through the naturally transparent medium to the surface of the water, and being there thrown in commotion, make the oars look broken." [84]

Summers comments on the above passage, pointing to the fact that Vitruvius acknowledged the mistakes of the sight by calling for the architect "to adjust the proportions of the buildings to achieve *eurythmia*.[85] He argues that optical corrections were not applied through *doctrina*, as *doctrina* would prescribe the original dimensions of the building, but rather by "*acumen ingenii*". [86] Summers emphasizes that it became necessary "not just to counteract, but to work with the fallacies of sight" by and through *ingenium*. He declares that the architect, working with real space, had to implement his optical understanding and erect the building with such proportions that once seen, it would appear harmonious. He states that this process situates "judgment immediate to sense…Or, sense is the final judge of the *appearance* of *ratio*".[87] Summers specifically underlines that this judgment is not particular to the building, rather it emanates from the "particularity of the architect who solves the problem presented by its real appearance."[88]

If we compare the passage in Vitruvius' treatise to another passage in the *Trattati*, we see that Francesco has his own take on the subject.[89] The given passage serves as an entry into Francesco's

84 Ibid.
85 Summers, Judgment, 48.
86 Ibid.
87 Ibid., 49.
88 Ibid.
89 Di Giorgio, Trattati, T2, Parti Delle Case e Palazzi, Modi per Trovare L'Acqua, 324. "|S56v- M10| L'intelletto nostro, come di tutti li corpi è più nobile, così di tutte le sustanzie immateriali et incorruttibili è manco perfetto. El quale in questa carcere del domicilio corpereo, per la debilità sua, alcuna volta giudica el contrario di quello che per latri tempi [gli] è parso vero. E non sola una volata, ma più più, d'una medesma cosa ha varii et opposite concetti."

chapter on houses in T2. He points out that the ability of the intellect to make judgments is faulty, since "our intellect" with its association with the physical body lacks perfection; therefore it might render different, contradictory, judgments of a given object. Francesco argues that this lack of perfection results in the intellect's judging "the opposite of what as appeared right the previous time", leading ingenious people to form different opinions when observing the same phenomenon. Unfortunately, he does not specify any remedy for this problem. Rather it can be deduced that for him the ever-changing nature of the intellect can be related, in turn, to the attaining of an almost "infinite" variety spoken of earlier. It is therefore to be celebrated rather than condemned.

THE COMING TOGETHER OF COMMON SENSE, MEMORY, AND IMAGINATION

In order to make the relation between Francesco's thoughts and drawings tangible, it is helpful to refer to an argument made by Onians claiming that by adding drawing (*disegno*) to the rank of *aritmetica*, and *geometria*, Francesco has put forward a novel interpretation of drawing's importance.[90] Onians connects this to Francesco's stay at the court of Urbino between 1477 and 1489, and particularly to the presence of Piero della Francesca. He refers to a similar instance in the introduction of *De Prospectiva Pingendi*,[91]in which Piero suggests that his treatise deals with *commensuratione* and *disegno*. Onians builds on the proximity of Piero's and Francesco's vocabularies to conclude that a similar propensity drives both treatises: to create an "almost scientific account of one of the visual arts" involving drawings and geometry.[92] Onians' qualification is essential as it identifies drawing as the element that is communicated through a visual medium and renders the intentions of the author's material.

I have selected a series of drawings, which depict a specific subject and are central to Francesco's preoccupations. My aim is to demonstrate the continuity as well as the differences between the four selected figures that are done at different instances of Francesco's life. The first drawing comes from Francesco's early *Codicetto*[93], followed by drawings in T1, and T2 that portray the

90 Onianas, Bearers, 172-3.
91 Piero Della Francesca, De prospectiva Pingendi, Edizione critica a cura di G. Nicco-Fasola ; con due note di E. Battisti e F. Ghione, ed un a bibliografia a cura di E. Battisti e R. Pacciani (Florence: Casa Editrice le Lettere, 1984).
92 Onians, Bearers, 172.
93 Di Giorgio, Il Codicetto, reprinted in Di Giorgio, Le schizze. According to the text that accompanies the German reprint of Francesco's sketchbook, he carried the sketchbook when he arrived at the court of Urbino to enter the service of Federico da Montefeltro. It seems that the sketchbook's size, 81 x 59 mm, was rare even for prayer books, let alone for a sketchbook in which drawings of large objects were contained. It appears that the sketchbook originally contained more than 235 pages, roughly 50 mm thick, of which forty pages were lost.

proportion of human body in relation to the plan of a church. The pocket-size *Codicetto*, playing the role of a professional prayer book in recording the architect's thoughts, is in fact a valuable counterpart to the drawings of the *Trattati*.

In the *Codicetto*, there is a drawing[94], Fig. 4 (f. 134 v, C., no title); different in nature from Francesco's other drawings in the compilation, and one that can be truly identified as the seed for his theory of human analogy in the *Trattati*. The small drawing, which occupies less than a quarter of a page and covers roughly an area of 40 x 28 mm, is the sketch of a standing man, with his arms stretched wide open, and his body divided into different segments. Different scholars date the *Codicetto* differently: Scaglia offers the span of 1470 to 1490 as the time during which Francesco drew in the sketchbook. The German-reproduction of the *Codicetto* suggests that the major part of the *Codicetto*'s content was done circa 1478 as it was presented to Ottaviano Ubaldini. No text accompanies the drawing and thus any understanding of the subject matter fully depends on the sketch itself. The sketch is not overly elaborate, yet it is a complete drawing as it expresses the intention of its author in a coherent manner. The fact that only half of the man's body is depicted is his succinct way of transmitting essential aspects.

On the right side of the man's body, extended lines divide his body to vertical segments and the areas around his hand and his head are extended to circles that in turn are connected to smaller circles. The division lines, as well as the circles, are all meticulously related to the body. All the major joints (limb, knee, and arm) as well as all the areas in between the major joints (shin, thigh, and navel) are clearly demarcated. There are two main circles bordering the body. One circle surrounds the hand, with rays extended out of the fingers, as if there had been an imaginary centre in the middle of the palm. In case of the second circle around the head, the intersection of lines stemming from the eyes to the centre line passing through the nose and the ears determines the centre. The centre of this circle falls on the symmetrical axis of the face and body somewhere along the nose. From each of the two principal circles other circles form continuity with the fingers of the hand, and from the head along lines passing through the eyes, nose, and ears.

From the geometrical point of view, this nine-part division, which is mainly based on a human body's characteristics and dimensions, leaves nothing to accident. However, the effectiveness of the sketch does not only rely on its common sense and practical wisdom in the fashion of

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The present sketchbook contains 191 pages, containing 1,220 drawings, of which the majority were taken from Il Taccola and reinterpreted.

94 Ibid., 134. No specific date is identified for the sketch in question.

Vitruvius. A closer look reveals an array of other dimensions that emanate from the white surrounding space and the sepia drawing: symbolic, metaphysical, and emblematic references spring forward as we look more closely at the image of the man and the church in an embryonic state. As we gaze into the silent yet intense intertwining of body and architecture or, more precisely, the body and what could be the beginning of a ruling principle for architecture, a theory for deriving and ordering architectural thought appears. This sketch, at one level a simple study of the possible divisions of a man's body, closely resembles Francesco's sketches in the *Trattati*. In order to make that argument, however, we would need to relate the drawings in the *Trattati* to the text that accompanies them.

The figure that would be the closest to Figure 4, in T1 is Figure 5 (T1, f.11v TAV. 18; entitled: Analogy between the temples and the human body, temples with transepts and cupola). The drawing shows a man's body surrounded by the precinct walls of a church. While the chapels emanating from the head are similar to the sketch in the *Codicetto*, the proportion of the transept is very different; as it incorporates the distance between the shoulders and the navel. In the sketch the transept starts right below the chin and extends all the way to the navel; the outstretched arm extends somewhere in the middle of that distance. In Figure 5, the arm is located higher and closer to the upper body. Maltese suggest that the figure drawing, in the Figure 5, bears the style of Neroccio's hand[95] and refers to the sketch in *Codicetto* as one that bears the same idea, but has nine divisions. Although the main ideas such as the radiating chapels are retained, overall the proportion of the sketch in Figure 4 is very different from that of the one Figure 5, since the circle drawn on the chest area, which defines the dimensions and placing of the transept is inherently different from that of the nine-part division.

In a passage on Temples in T1, Francesco balances the body and architecture: architectural rules follow the rules of the body.[96] He states that basilicas have a similar size and shape to the

95 Di Giorgio, Trattati, annotation of the folio by Maltese, 256.

96 Ibid., T1, Templi, 45. "|…T 12|Avendo in parte ditto delle misure, nomi e modi delli antichi tempi, ora delle moderne formazioni costituiremo. { le prescrizioni che seguono sono approssimative e incerte. Saranno precise e matematicamente definite solo nel testo conclusivo rispecchiato da M. (Cfr. Pp. 393-410)} Ed avendo le basiliche misura e forma del corpo umano, sicome el capo dell'omo è principal membro d'esso, così la maggiore cappella formar si debba come principal membro e capo del tempio. E come ha cinque linie e partimenti, così cinque capelle avere debba. Quelle di mezzo la longhezza e larghezza della distesa fronte e faccia, e la bocca che per diritta linia secondando {seguendo} el naso va, e due dispari {due paia separate di capelle (due per gli occhi e due per gli orecchi)} degli occhi gli orecchi, che tutte queste in nella lor circumferenzia a un centro referire. Similmente la quadratura dell'amprio petto alla trebuna s'attribuischi, le braccia la croce d'esso, le palme delle mani le due conferenti capelle, le liniari dita gli cinque emicirci ch'entrono a esse vanno, e l'altre parti sei al corpo della chiesa dato sia. E in chiascuna parte una capella formar potrai, in nel mezzo d'essere partizioni. E siccome el petto è larghezza di due teste, quella medesima quadrata

human body. Just as "the head of the man is his principal member", so is the main chapel to the body of the church.[97] Francesco then explains that as the head has "five lines and divisions, therefore the basilica must have five chapels." His explanation proceeds to describe the lines emanating from the eyes, the ears, the nose, all come together at the center and demarcate the location of the peripheral chapels. Francesco then explains that the cross corresponds to the area of the upper body to the navel. He confirms that "the arms are the cross" and that the palms of the hands "the two side chapels". Francesco concludes by stating that similar to chest being twice as long as the head, the same square based on the head should designate the relation between the church and the cross.

The corresponding drawing in T2 is Figure 6 (T2, f.42v TAV. 236; entitled: Anthropomorphic proportionality in plan of a temple of longitudinal plan, dividing the height of the human body to nine and seven parts.) In this later version, we see that only the essential set of geometric elements are kept, and the body is juxtaposed and divided with the help of lines, points, circles, and diagonals. Figure 7 (T2, f. 38v TAV. 228, T2; entitled: Scheme of the proportionality of the façade of a temple with a longitudinal plan) precedes Figure 6 in the order of the chapter but is nonetheless a natural extension and continuation of the same theme. It uses similar language and principles to divide the body, this time for a frontal elevation view. Figure 6 and Figure 7 both depict men standing with their hands tied behind their backs, different from both Figure 4 and Figure 5. The slight opening of the legs, which seems to indicate a casual pose at first sight, demarcates a rectangular area from just below the knee cap and designates the with of the main entrance. The figures are related to a passage in T2 that describes their proportions. [98]

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disegnazione al corpo e alla croce osservar si debba."

97 Maltese reminds s that the relations that Francesco establishes in T1 are "approximate and uncertain." He states that only in M, those relationship become mathematically defined only in the final text reflected in M. CF. Trattati, T2, 393-410 and T1, 45(4) footnote by Maltese.

98 Ibid., T2, I Templi, 402-3. "|…M42|Perché appare molto più necessario alla ragione dovere satisfare che alcuno nostro sensuale appetitio, e massime quelle che con arte e ingegno debbano essare governate, siccome in el costituire alcuno divino o sacrato tempio, e perché e sono molte varie opinioni donde tal partimento abbi avuto origine o principo, è da considerare che molti solertia e speculative ingegno si sieno affaticati imitare la natura in tutti li esercizi, e da quella hanno trattato le ragioni sì come partimenti e membri del corpo umano, da quale il numare perfetto, come platone descrive, si trova essar tratto, e Vetruvio le misure de' tempi e colonne, senza la cui simmetria dice alcuno artifice potere nissuna cosa con ragione bene operare. E trovando molte varie opinioni |M42v| imparare esso corpo, ho <de>terminato alcuna brevemente (tav. 236) dimostrare. In prima e da sapere che in due modi si può dividare , cioè in parti nove et in parti sette. Quello di parte nove è: tutta l'altezza della faccia, dalla estremità del mento al nascimento de'capelli, è una parte; dalla forcina della gola allo estremo petto un'altra, e da questa deal nascimento de'testicoli è parti due, e da queste all'astragolo del gionocchio due alter; le gambe insino in sul collo del piè e diametro della gola fanno l'altezza della nona, e questo è il partimento di tutto il corpo. Di poi si parti la testa in tre equali parti. Così partito, si ponghi il centro alla linea media estremità del petto circumvoltando una linea dal naso all o estremo busto, le cui estremità sarà tutta la larghezza del tempio; dalla quale si tirarà le rette linee insino alla ba<s>sa linea delli estremi calcagni, la quale sarà quadripartite; li quail partimenti e linee si tirarà insino al sommo. Di poi si pigli le parti dal naso al carneo, e quelle da man destra e sinistra della linea centrale AB s'attribuisca; le quail tutte partite in parti

Francesco starts this passage by stating that "it is more necessary to satisfy reason than our sensual appetite", and he enumerates principles and creativity (*arte e ingenium*) as the two parameters that should rule the design process for making temples (churches). Francesco describes that there have been many discussions as to what the source of such disciplines and principles would be, and he claims that many "cunning and inquisitive geniuses have exhausted themselves in trying to imitate nature" and therefore the human body. He refers first to Plato and then to Vitruvius regarding the relationship of the perfect number (proportions) to the design of the churches.

We can infer that the link to our sensual appetites is important; desire is not excluded from the theory of human analogy. By imitating nature in general, and man in particular, and in making architecture in the likeness of man, we respond to and satisfy our sensual appetites while pleasing reason. Thus the question to which Francesco responds is to what extent and in what manner should one imitate nature. He refers to Plato in a passing comment, and offers the imitation of the human body with its measures as an answer. That Francesco openly mentions *ingegno* and adds the adjectives of *solerti* and *speculativi ingengi* demonstrates that for him the adoption of the measurements and proportions of the human body imply a level of investigation and cogitation, and not a simple *de facto* acceptance of the principles developed by the Greek and the Romans. The human body and nature are models; but they are not simply that, any more than is Antiquity. Their application calls for interpretation, investigation, and invention.

Francesco explains that there are two different ways of dividing the body: one into nine parts, and the other into seven. He first sets out to describe the nine-part divisions by dividing the height of the face from the hair scalp to the nose, then from the nose to the chin, and so on; this part producing nine divisions. Once again there are discrepancies between the text and the drawing; Francesco begins by describing the first division as the length of the whole head, while the drawing demonstrates the first module differently. Overall, the nine-part division is based on smaller divisions

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quattro faranno la circumferenzia delle emicili, e cusì quelle delli anguli, preso l'ordine loro sopra le intersecazioni della circunferenzia, e così tirare tutte le quadrature delle linee e tutti li emicicli, si tiri una circulare linea per la nave o tolo toccando la estremità delli anguli del quadrato d<i> mezzo chiamato CDEF; e simile dentro al minore quadrato si può costituire, e questo sarà partito: piglisi una parte dell'altezza della testa MT, over oil mezzo del emiciclo, sedici parti la circumferenzia del tolo si trovarà, e così tutte le navi e colonne si collocaranno, come partitamente nella presente figura si manifesta.

Altre misura e divisione del corpo pigliandosi l'altezza di tutta testa in sette equali parti debba essar divisio. Dipoi si ponga il ponto del circino in su 'imbellico et intersecazione delle linee, una circumferenzia dall'ultimo mento a l'astragalo del ginocchio, e all'estremità del circulo si tiri le linee laterali terminanti dal carneo a la bas<s>a linea delli infimi calcagni, la quale linea in quattro parti sarà divisa. Dipoi si tiri uno semicirculo al sommo del carneo terminato AB, e a questo sarà il loco di simulacro. Di poi sopra l'imbellico si pigli un'altra cintrica circumferenzia toccanti le estremità delle linee medie terminate DEFG, e questo è quando accadesse a far la cupola ovro tolo che le navi senza impedimento possino circumdare, si come la figura ne manifesta."

of the main module and mainly relies on systems of squares (*quadratura*) to derive the rest of the measures. The center of the body here is moved up and is no longer located at the navel. It is closer to the upper part of the body, the head and the heart, although Francesco does not make any particular reference to the heart.

For the seven-part division, Francesco describes dividing the body into seven equal parts, and then he suggests placing the point of the compass in the navel and drawing a circle with a diameter to the length of the chin on one side and the knee cap on the other. Then by drawing a half a circle, atop of the first one, one derives the limit of the sanctuary; a smaller circle limited to the area between the phallus and the chest gives the appropriate size for the dome.[99] I believe that while the size of the latter seems appropriate, the location is off-center. I suggest that in the drawing the two circles and the semi-circle indicate unity, self-sufficiency, a harmonious relationship of the parts to a larger whole, and a relationship to other elements. Hence the gap that exists between the actual location of the dome, and the suggested size of it, once again should be understood as referential and not actual. The drawing is intended as a model, not a template.

Francesco's text is slightly more extensive than is Filarete's, and framed more philosophically; but his message is conveyed not so much by his words as it is by drawing. The drawings are more immediate and palpable than the text. This series of drawings clearly communicate the architect's ideas, precisely because it leaves the door open for adjustments. These three manifestations of the same thought, starting with the *Codicetto* and ending with T2, span roughly twenty years. The drawings share the same intention, and yet each instance evinces a distinct emphasis. In the *Codicetto*, we are only looking at the beginning of an idea; Francesco renders this idea in drawn form, perhaps to study, verify or simply remember something that has been on his mind. In T1, the detailed drawing represents the image of a man with all its figurative characteristics, juxtaposed to a detailed plan of a church. Finally in T2, the diagram-like drawings[100] allow one to read the juxtaposition as, not a literal assimilation of man and built environment, but rather as a generation of one out of the other. Aside from the diagrammatic nature of the drawings, the fact that discrepancies exist between Francesco's text and what he has drawn – in both cases the drawn figures depict his key intentions more thoroughly than his text does – may be understood as prioritizing drawing as the ground for such investigations.

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99 In Francesco's definition, the letters indicated on the figure doe not correspond to the ones indicated in the text. Also see Trattati, 404 (4) by Maltese.

100 Onians uses the term "geometrical diagram" or "linear diagram" emphasizing the drawings' characteristics in revealing a set of proportions and relationships. Cf. Onians, Bearers, 175.

Scholars such as Lawrence Lowic and Richard Betts have shown that Francesco's theory of human analogy is strongly reliant upon both Greco-Roman and medieval traditions, as will be referred to in the next chapter. My point here is to supplement their observations by stating that Francesco's drawings render these allusions palpable. Francesco advances them in a new language, one that makes sense without having recourse to the traditional locus of architectural theory, the text. Francesco's drawings are not just about a mathematical or geometric system: the drawing of the man fortifies the architecture, works of architecture emanate from the man, one picks up when the other leaves. Though architecture is supposedly borne on man's shoulder, it also shields and protects him. The original sketch of the standing man, and its later iterations through T1 and T2, fall within and potentially carry forward Francesco's theory of human analogy. The mutual references, one feeding into the other, make the drawings into an active, cyclical and dynamic system.

CLOSING

To conclude, my aim in the present chapter has been to relate Francesco's textual formulations to the process of formation of ideas in his drawings. To define Francesco's creative process, and relate it to his avid desire in producing images, I like to borrow the term "poetic image", described as follows. In *Built upon Love*, Alberto Pérez-Gómez qualifies *lineamenti*, defined by Alberti, as "the essential geometric 'idea' that issued from the architect's mind, took the form of a drawing and guided the production of architecture."[101] Pérez-Gómez confirms that for Alberti and his peers architecture, promoted to the realm of liberal art, was the "product of the soul's intelligence".[102] By referring to Marsilio Ficino's recognition of the two entities of the soul as "contemplation and intelligence," Pérez-Gómez argues that intelligence was framed such that it could comprehend things all at once, "in a single timeless vision".[103] He argues that such an understanding might be at the core of the desire to encapsulate the idea of a building in form of a drawing, often represented through raised points of view. Pérez-Gómez argues that these drawings are not systematized representations of buildings, but should be understood as "poetic images" that are "an architectural promise of a future, a divination in search of the good life."[104] The notion of the "poetic image" is central to the content of this chapter. In Francesco's written and drawn oeuvre, drawing is advanced as a ground for the development and maturation of insight; it simultaneously anticipates and nourishes foresight. This

101 Pérez-Gómez, Alberto, Built Upon Love, Architectural Longing after Ethics and Aesthetics (Cambridge, MA: MIT Press, 2006), 79-80.
102 Ibid., 79.
103 Marsilio Ficino, Commentary on Plato's Symposium on Love, Translated by SearsJayne, 2nd edition, (Dallas: Spring Publications, 1985).
104 Pérez-Gómez, Built upon Love, 79.

magical role of drawing, alternating between a communicative tool and a vessel of divination, might be made more tangible for us through a brief reference to one of Francesco's paintings.

The painting in question is the Annunciation[105], Figure 8, done circa 1471-1472. The painting depicts the moment the angel Gabriel delivers Mary the message that she will bear God's son. In the foreground, the angel, dressed in blue with blue wings and blonde hair, approaches Mary with an olive branch in his right hand. Mary, who sits in a pose partly facing the lectern and partly facing the angel, is depicted as slightly bigger than Gabriel; she has blond hair and delicate hands. The arches that occupy the centerline and part of the left side of the image depict slender purple columns, connected to a series of red arches. In the background, part of a round temple and the distant profile of a city are perceptible. Overall the perspectival depiction of the lectern, the floor tiles, and the ceiling vaults is unsystematic. While there is a bit of shadow created by Mary's right foot, the angel is shadowless and seems to hover above the tiled floor.

The Annunciation, being one of Francesco's greatest masterpieces, is defined by Bellosi as "the quintessence of the mystical and lyrical, and non-scientific spirit which would define the Sienese art."[106] Syson contextualizes the duality present in this part-realistic and part-fantastic painting as a difference between the "visionary transcendence" of the Sienese school of painting and the "earthbound realism" of the Florentine school.[107] He explains that faced with the inventions of the Florentine artists, the Sienese painters were challenged to either give in and adopt the tenets of the Florentine school, or create a change in their own painting style. Syson argues that the Sienese artists' reaction was is in fact more complicated; as reflected in the works of Francesco and his contemporaries, exhibiting elements of both schools of painting combined together.

Referring to an earlier Sienese Annunciation by Simone Martini[108], which depicts a kneeling angel literally delivering God's message to an alarmed virgin, Syson enumerates the differences, while at the same time recognizing some similarities. First he points to the fact that in line with traditional hierarchic scale, the virgin is drawn larger than the angel. The weightlessness of the angel, the color of his dress and his wings, and his light hair all exude the ethereal nature of his existence. Syson points out that in contrast to Simone Martini's golden background, Francesco sets the scene before an architectural backdrop. Referring to the unsystematic perspective, which represents an oddly

105 The Annunciation: Tempera on panel, 73.5 x 48 cm, in the early 1470s, is currently held at the Pinacoteca Nazionale, in Siena. The work is reproduced in Bellosi's *Francesco di Giorgio et il Rinascimento a Siena*, Bellosi offers the date as circa 1470 and Syson circa 1471-1472. Bellosi, Rinascimento., 296, 297and Syson, 134-139.
106 Bellosi, Rinascimento, 30-31.
107 Syson, Renaissance, 134.
108 Simone Martini (1284-1344)'s Annunciation is held at Galleria degli Uffizi in Florence. The work is dated circa 1333, tempera on Panel, (184 x 210 cm).

foreshortened lectern and very slender columns, Syson argues that the centric point[109] of the perspective is located at the level of the Virgin's eyes, off center and to the left.

In his assessment of the painting, Luciano Bellosi builds upon a hypothesis from Angelini that there was a second artist involved, one that did not have Francesco's abilities to resolve perspectival flaws. Angelini was perplexed by the lack of rigor and logical perspectival view in this painting; Francesco had previously manifested such views in other paintings of the 1460s. Bellosi extends Angelini's argument by referring to this unknown figure as Francesco's Fiduciario. He maintains that based on a particular work arrangement Francesco was responsible for preliminary design, and works were later delegated to this particular Fiduciario. Bellosi refers to evidence from infra-red examinations to argue that the existence of partial undredrawing, more ambitious than the final result, is proof of the Fiduciario theory. On the other hand, Syson suggests that Francesco made and executed the drawing for the most part himself, as it would seem irrational for him to have entrusted his work to one who was so unqualified to follow his directions. He claims that the existing discontinuities result from *in-situ* changes that Francesco might have deemed appropriate at the moment of execution. Syson emphasizes that the "immateriality" of the scene is fortified by its unsystematic perspective. While the art historical debate continues in both directions, what is of interest here is not to find a definitive answer for the dilemmas that the work represents, but to dwell on the dilemmas.

Returning to the notion of "poetic image", Francesco's painting can be looked at with a different lens, one that undermines technical cogency and systematic methods of representation. The painting can be read as embodying several themes at once. First, it recounts a story with fidelity, and in that manner is connected to both its biblical source and its Sienese lineage. The painting's background depicts an architectural space, a round temple and the outskirts of a city; it is thus anchored in its present context, bearing the painter's individual traits of hand and mind. Most importantly, and recalling Zeuxis' story, the painting manifests the imagination of the painter that has composed the specific elements of the scene. The presence of these elements and their interrelationships shape an entity that is at one and the same time realistic and fantastic, which narrates a story and creates its own sub-stories, and which renders what is known while making tangible the invisible.

It might at first appear from the discussion early in the present chapter that for Francesco

109 Syson uses the term vanishing point, but based on a discussion in Perspective hinge, I have used the term centric point. Cf. Pérez-Gómez and Pelletier, Perspective Hinge, 20.

the visual sense prevails over all other senses, and that his arguments and theories are most palpably conveyed visually. But the overtones, undertones, and associations that make up the body of the drawings are in fact more complex than this first impression suggests. In the earlier part of the chapter I looked at Francesco's vocabulary of creation and his insistence on the primacy of *ingegno* as an innate ability to conceive and advance architecture, hand in hand with *inventio*, the day-to-day inventiveness that allows the architect to arrive at specific solutions. Creation in architecture has two sources: pure invention from nothingness, and the recollection of other examples of a similarly ingenious work. To this is added the more mystifying and opaque *fantasia*, as mental images, fantasies, dreams, or even pure drawings, ever-present in and emerging from the architect's mind.

To know which *fantasia* to carry forward, one needs *ingegno,* and in order to face day-by-day architectural problems one requires *inventio*. This constant working and reworking, based on old materials, formats and structures, is part of the overarching Renaissance culture, and specifically a topic that is close to Francesco's interest. Notions such as creativity, invention and imagination are more preoccupied with an augmentation of previous material, recurring changes brought to older concepts, and minor variations applied to well-defined rules in his work. Any debate on these subjects should include such an understanding. For Francesco *giudizio* is rooted both in reason and in sensual appetite, guided by sight yet realizing that senses are indeed prone to fault. Therefore, in his view one needs the mind's eye in order to make judgments as much as one is dependant on the eyes to sense and order the right decisions.

By following the maturation process of one of Francesco's sketches, it became apparent that his ideas, constantly shifting and evolving through drawing, are in fact embedded in history and antiquity while maintaining their insatiable desire for infinite invention. Francesco's formation of thought and its manifestation as drawing are so genuinely intertwined that the existence of one implies the presence of the other. The *Trattati* advocate for drawing as a magical act, a ritual that allows the architect to transfer an idea formed in his/her mind into a tangible form. This tangible form is more complex than just a visual entity, as it becomes the threshold for the meeting of the inner and the outer eye.

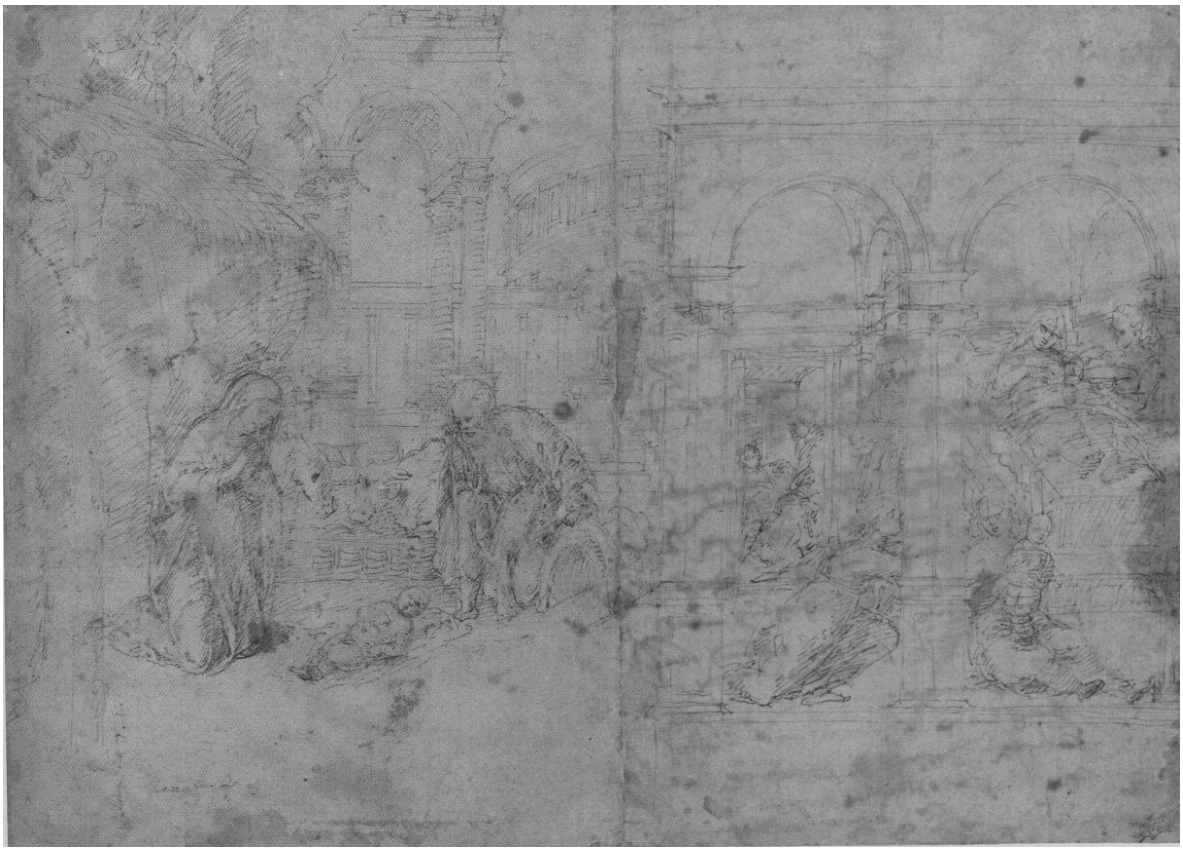
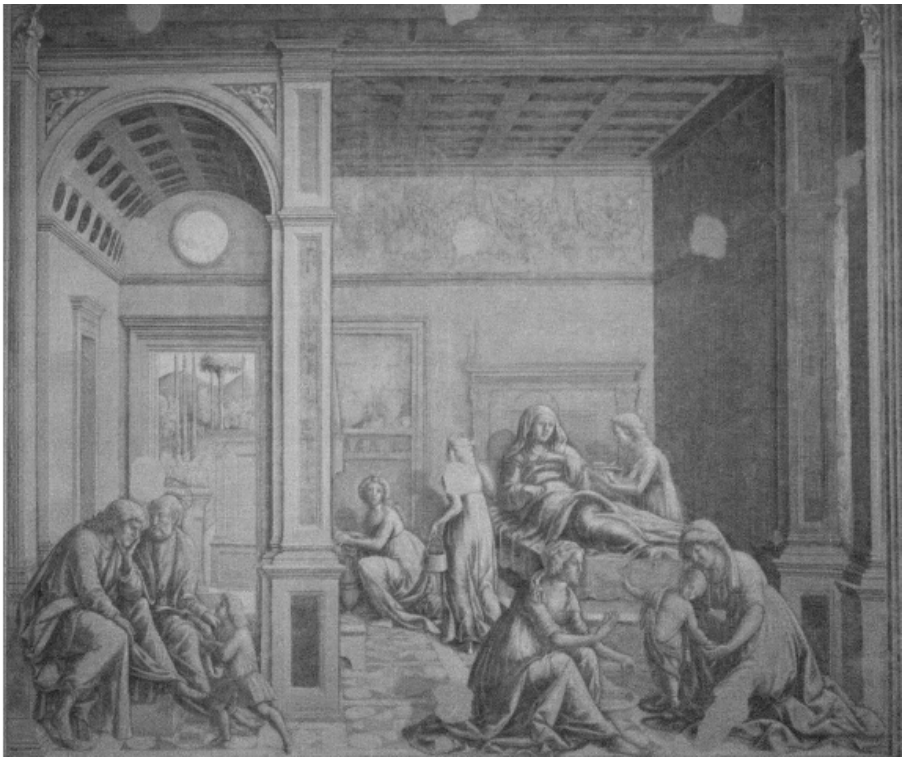


FIGURE 1. SKETCH FOR THE NATIVITY OF CHRIST AND THE BIRTH OF VIRGIN, CIRCA 1488-90.

Pen and brown ink on paper, 23.1x 32.8 cm, Hamburger Kunsthalle, Kupferstichkabinett, Hamburg



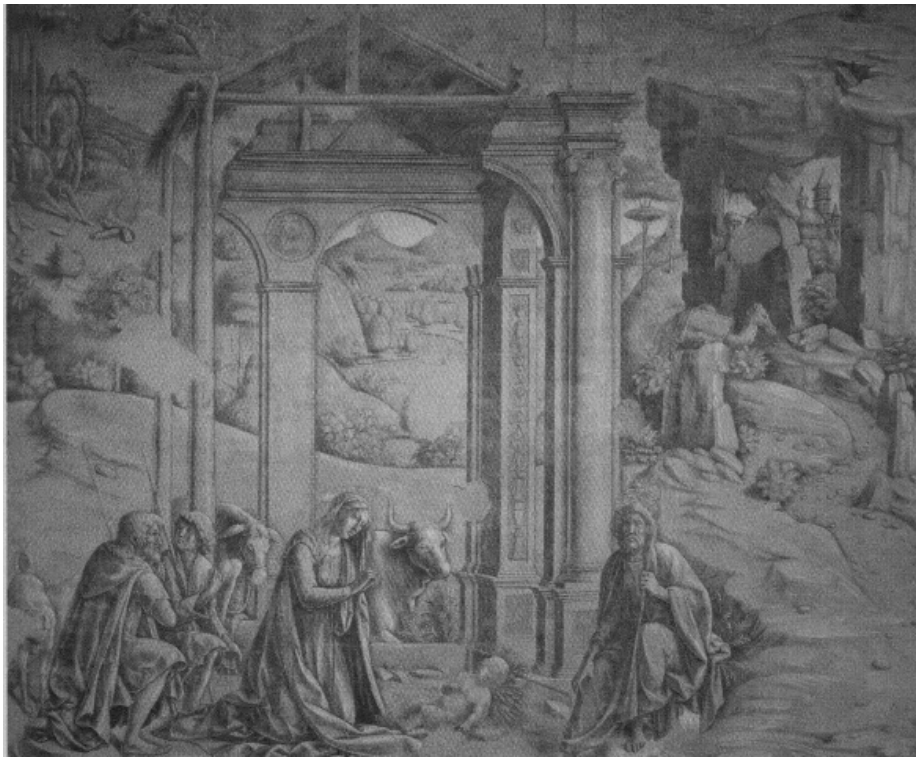


FIGURE 2. THE NATIVITY OF CHRIST, CIRCA1488-91) AND FIGURE 3. THE BIRTH OF VIRGIN CIRCA 1488-91, FRESCO, BICHI CHAPEL, CHIESA DI SANT'AGOSTINO, SIENA.

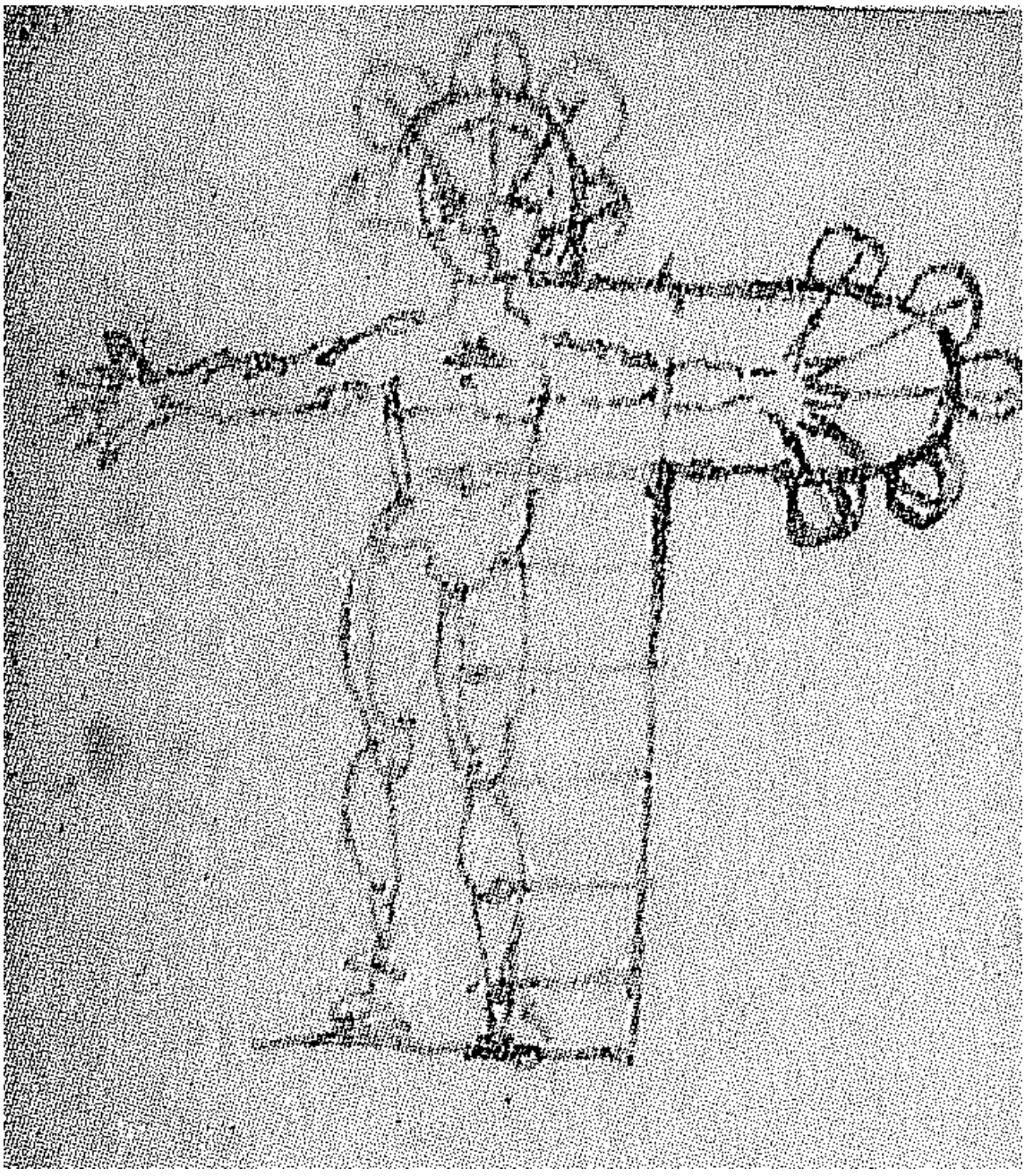


FIGURE 4. F. 134 V, NO TITLE; *CODICETTO*.

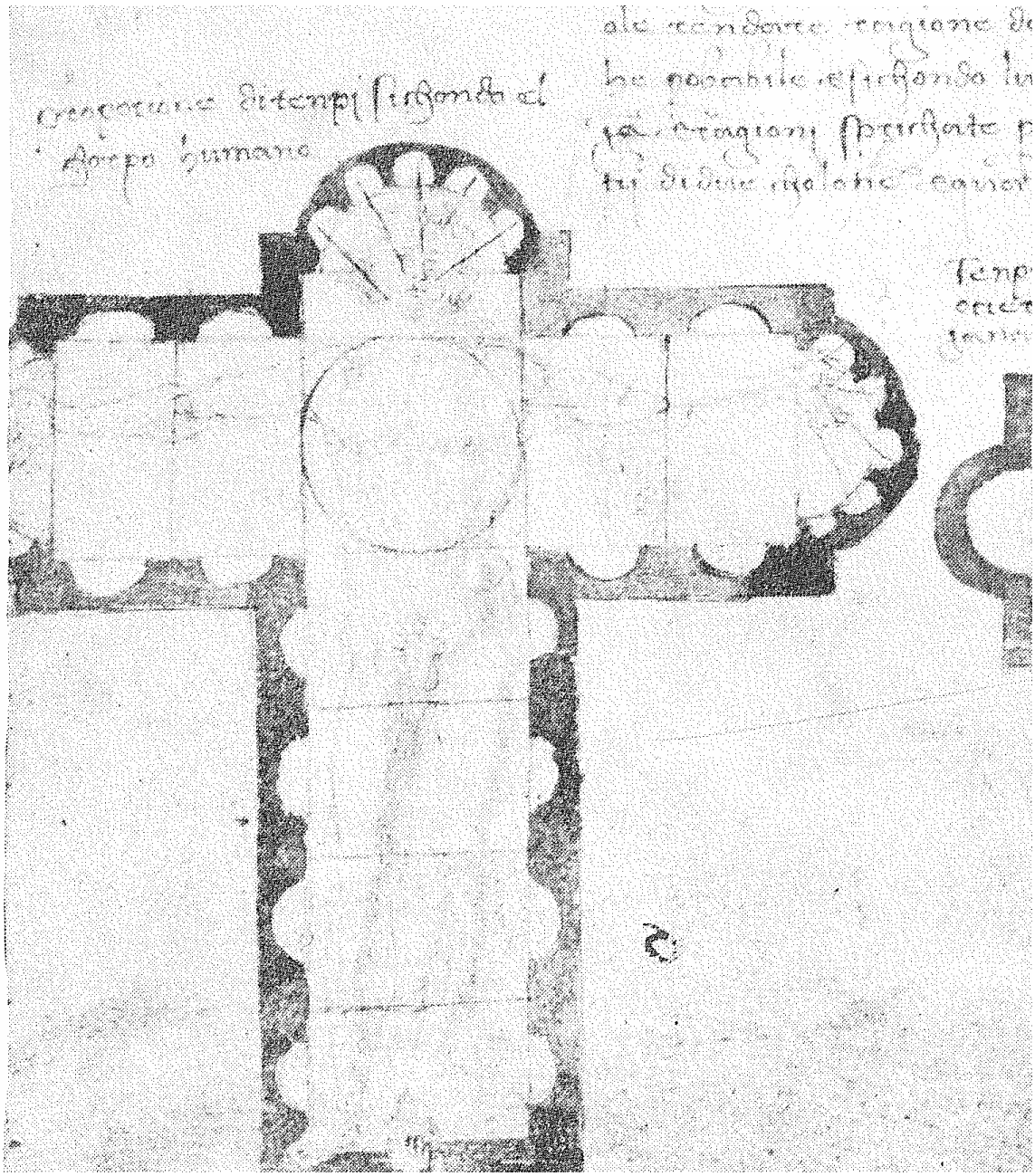


FIGURE 5. T1, F.11V TAV. 18; ENTITLED: ANALOGY BETWEEN THE TEMPLES AND THE HUMAN BODY, TEMPLES WITH TRANSEPTS AND CUPOLA.

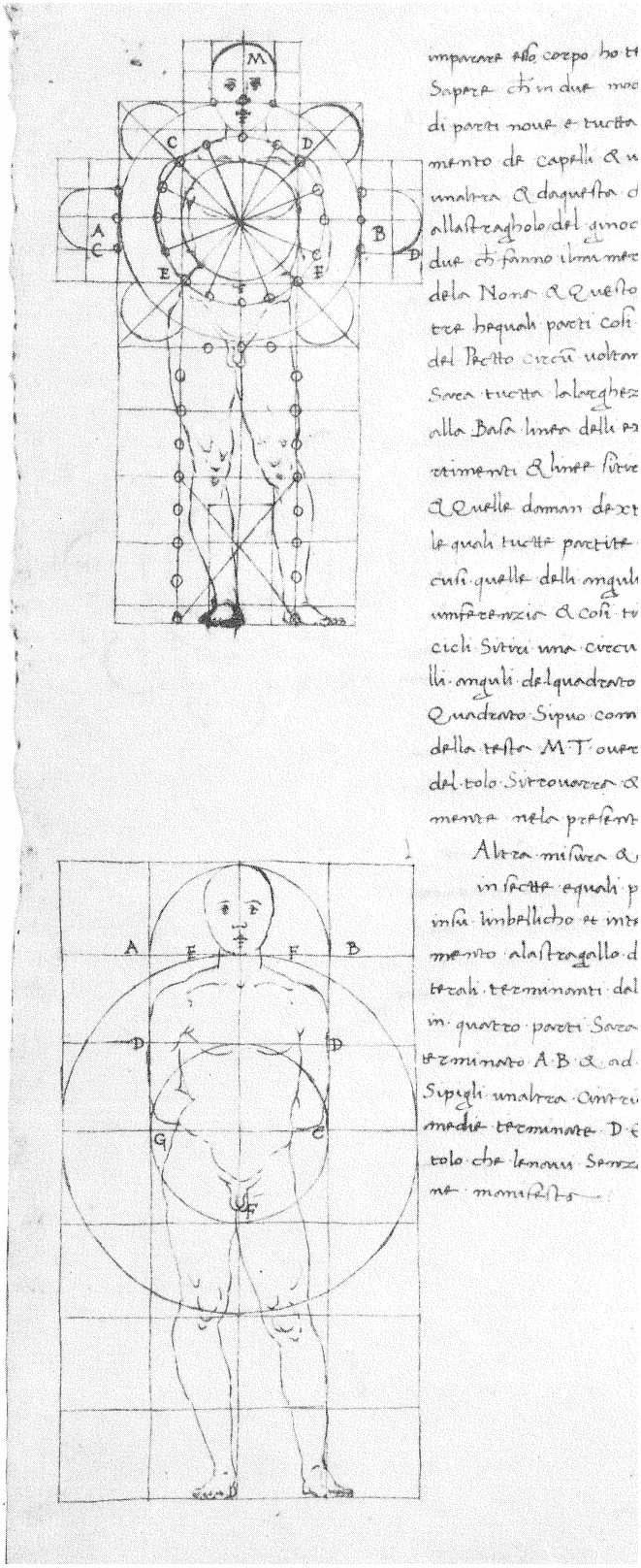


FIGURE 6. T2, F.42V TAV. 236; ENTITLED: ANTHROPOMORPHIC PROPORTIONALITY IN PLAN OF A TEMPLE OF LONGITUDINAL PLAN, DIVIDING THE HEIGHT OF THE HUMAN BODY TO NINE AND SEVEN PARTS.

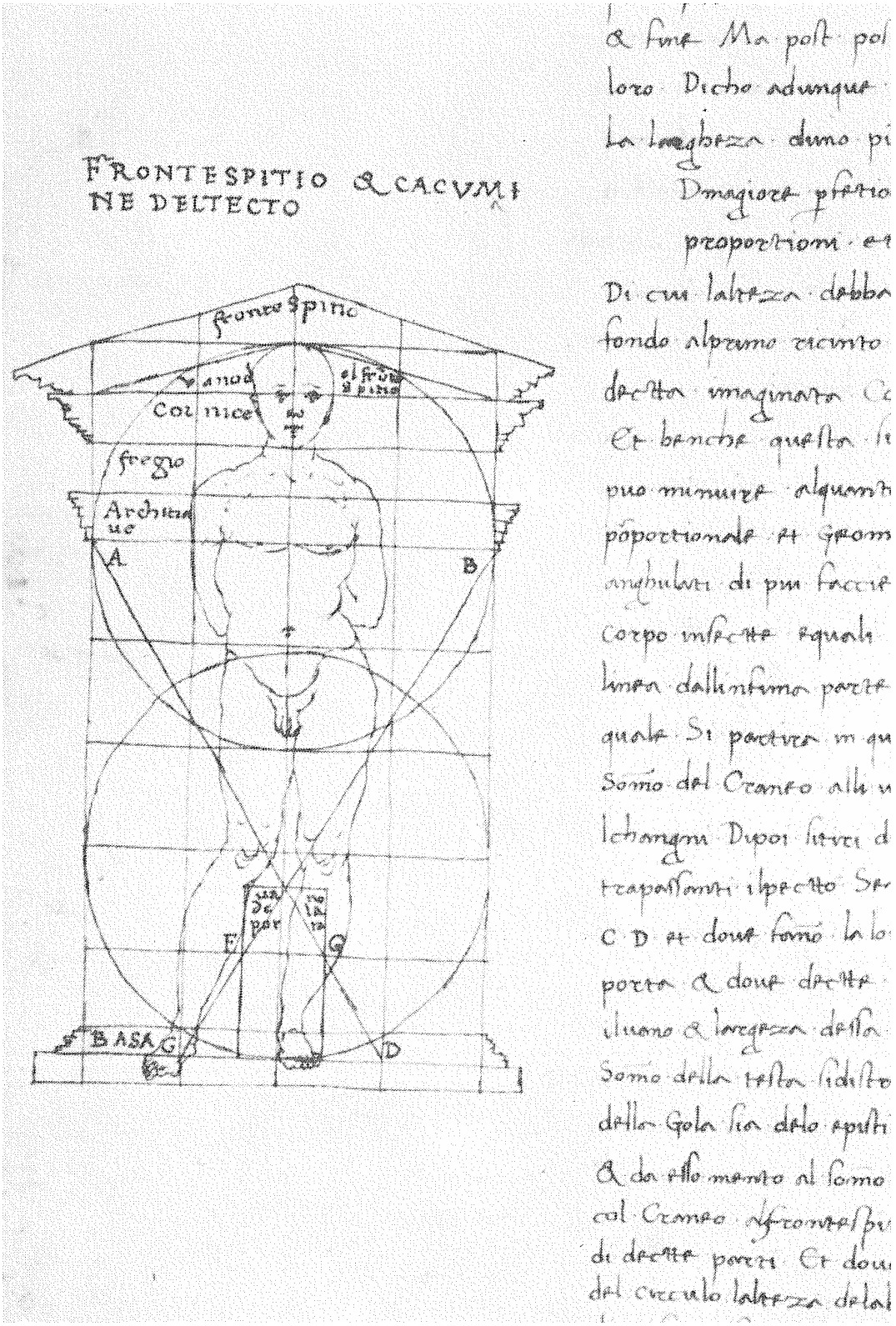


FIGURE 7. T2, F. 38V TAV. 228, T2; ENTITLED: SCHEME OF THE PROPORTIONALITY OF THE FAÇADE OF A TEMPLE WITH A LONGITUDINAL PLAN

FIGURE 8. THE ANNUNCIATION
CIRCA 1471-2
Tempera on panel, 73.5 x 48 (with original frame), Pinacoteca Nazionale, Siena

CHAPTER FOUR
A MULTI-FACETED MIRROR: DRAWING'S DIFFERENT FACES

"…metaphors should be transferred from things that are related but not obviously so, as in philosophy, too, it is characteristic of a well directed mind to observe the likeness even in things very different."[1]

Aristotle

A MULTI-FACETED MIRROR: DRAWING'S DIFFERENT FACES

OVERTURE

In *Interpreting the Renaissance*, Tafuri suggests that while it would be "naive" to materially prove a direct influence of humanist thought to the works of painting and architecture, it is more appropriate to identify them as "metalanguages that obliquely traverse the spaces of architectural language, conditioning their organization and liberating their potentials."[2] In this chapter, I intend to identify an order in Francesco's drawings based on themes explored in the *Trattati*, and relate them to concepts that were present in the Renaissance discourse on writing, rhetoric, architecture and painting.

One can discuss the characteristics of Francesco's drawings from many points of view. The questions of authenticity, chronology, and type can each be examined to show that his use of drawings is both intentional and unique. In my argument I will divide the drawings into three

1 Aristotle, On Rhetoric, A theory of Civic Discourse, Translated with Introduction, Notes, and Appendices by George A. Kennedy, (Oxford: Oxford University Press, second edition, 2007), Book 3, Chapter 11, 1412a, 233.
2 Tafuri, Interpreting, 7. Tafuri particularly speaks about Baldassare Castiglione's The Courtier.

categories, based on type, but also based on Francesco's own formulation of his thoughts. The first category is comprised of **interpretive drawings**, which include Francesco's documentation of ruins, which he used to compare with Vitruvius' text. A second category includes his **theoretical** drawings, which pertain to his own ideas, such as his theory of human analogy. A third category is that of **inventive** drawings, including those of machines and fortifications. Although some drawings belong to more than one category at time, they are indicative of how Francesco significantly stretched the boundaries of architectural drawing compared to his contemporaries.

I believe Tafuri's identification of Renaissance architecture as "walking a fine line between the need for the rule and the need to transgress"[3] could be borrowed to qualify Francesco's intention in writing his *Trattati* in general, and in his composing his drawings in particular. Throughout the *Trattati*, Francesco describes the rules and principles of what he deems appropriate for different types of buildings and problems. As well he offers examples through drawings, shedding light on his verbal explanations. The drawings aim at making the principles of the text more lucid, to clarify the architect's theoretical positions. However at the same time, due to their visual nature, Francesco's drawings evade the fixation of written words, and thus offer diversions as critical parts of their existence.

The very fact that Francesco himself offers the explanation that drawings are intended to clarify his points, yet that their possibilities are not confined to the realm that he is describing either in text or drawing, allows for further transformations and diversions on the part of the reader. It would be appropriate at this point to also refer to Onians, who brings to light a statement of Francesco in the prologue of T2, emphasizing that "he will not be a *determinatore*, some one who lays down the rules, but a *motore*, a stimulating influence on the higher minds."[4] Although I believe the emphasis in Francesco's own words is slightly different,[5] the fact that *Trattati* is to be used as a guideline to steer the architect in the right direction is repeatedly alluded to by Francesco. This discussion is necessary as the above-mentioned categories do not limit themselves to merely an effort at categorization, but make apparent the different possibilities inherent in Francesco's drawings. These potentials in and of themselves are not limited to his time and methods, and act as beacons to shed light on the practice of the architect across a much longer span of time.

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3 Ibid.

4 Onians, Bearers,178. Onians seems to be so taken by this point that he uses that fragment not only in the opening of his book but expanding on it in the chapter on Francesco.

5 Di Giorgio, Trattati, T2, Epilogue, 298. "Ma io, non avendo di questo molestia, solo questo merito delle fatighe mie aspetto, che dal qualche intelligente da alcuna parte mi serà rendute grazie se non come determinator, almeno come motore delli altri ingegni piu sublimi e vertuosi" I would translate : ".....but I only expect of these intelligent people, that thanks be rendered to me, if not as a *determinatore*, at least as a *motore*."

I suggest that this flexibility of drawing is directly related to the fact that throughout the *Trattati* one comes across all forms of drawings. The range includes: planimetric views of houses and churches; drawings that combine human figures with architectural elements, mainly in orthogonal views (elevations, and occasionally plans); one-point perspectives in which architectural elements or spaces are illustrated; and unsystematic isometric drawings of machines and fortresses. The question of what would constitute the "formal" characteristics of Francesco's drawings is posed. Two specific issues related to the formal nature of drawings are examined: the superimpositions of different figures and architectural components, and the complexity and variety of three-dimensional modes of representation.

In the present chapter, I would examine the potential correspondence between the content and the form of Francesco's drawings. While in reality the content and form of drawings are not distinct from each other, this specific separation is made in an attempt to flesh out some of the characteristics of Francesco's drawings with regards to each component. Each section comprises examples of a few drawings that shed light on the discussion. The examples are not exhaustive; they are not a catalogue of drawings, but rather represent currents and trends detected in *Trattati* by offering one possible reading of them. Many more drawings belong in the same category; as well, cross-pollination and nonconformity is inevitable.

DRAWING AS *MODELLO*

Prior to expanding on each category of drawing in the *Trattati*, a couple of points are in order. Chapter two traced the references Francesco made to the role of his drawings as the elements that would clarify or better describe his verbal explanations. In the same chapter, reference was made to a passage in T1, in which Francesco explains that is necessary to make a *modello* out of each specific case.[6] While the discussion in chapter two offered possibilities of the word *modello* as three dimensional models or drawings, I would like to expand the hypothesis of Francesco's use of the term *modello* for his drawings. I believe this is a necessary step prior to dividing up his drawings into

6 Ibid., T1, Leve di Ruote e Mulini, 142. "| ...T 33 v...|Quantunque difficili sia in disegno ogni cosa demostrare, neanco per scrittura in alcun modo molte cose spriemar non si può, perché son tante le varietà delle cose interrotte e opposite l'una all'altra che a occupare si vengano, e però è necessario quasi di ciascuna cosa modello fare." The translation would be: "Although it is difficult to show every thing in drawing (*disegno*), without even writing in every mode many things cannot be expressed, because there is such a variety to the things interrupted and opposite to one another that we are going to be busy with that it is almost necessary to make a *modello* of every one."

different categories. In order to elaborate on this hypothesis, a background should be offered on *modello*, and consequently on another term, *modano*.

The etymology[7] of *modello* entails two meanings. One is what we understand as a model, i.e., a smaller-scale construction of a bigger object of an unrealized work, or of a remake in smaller scale of an existing structure. Its other connotation pertains to example or prototype. Closely related to *modello*, there is a specific type of drawing, the *modano*, (often presented in its plural form *modani*), which belongs precisely to the domain of architecture. It consists of drawings that were primarily prepared by architects for the construction phase. In *Architectural Representation and the Perspective Hinge*, Pérez-Gómez and Pelletier discuss the variations on the term *modello* by looking at Vincenzo Scamozzi's treatise.[8] They suggest that prior to the Sixteenth century; *modello* pertained primarily to "measurements and proportion," as it is of the same root as *modus* and *modulus*.[9] Pérez-Gómez and Pelletier refer to the fact that for Vitruvius *modulus* referred to the "semidiameter of a column." They continue that all the way through the Middle Ages, and in particular cases in the Renaissance, model was used as synonym for module and evoked "a one to one relationship between the pre-existing order of the universe and a mimesis of the divine purpose."[10] They also refer to the relation of *modello* to *modani* in Italy.

Although the material left from Francesco does not exhibit any specific *modani*, considering that this particular type of drawing was part of architectural practice qualifies this brief introduction. In an article called: "*I Modani*: Template Drawings" Tracy Cooper defines the most common understanding of the *modani* as "drawings which provide a cut-out template for stonecutters to follow in carving ornamental details."[11] Yet she argues that these 'models', referred to as "*modani* in Central Italy, *Sagome* in Northern Italy, profile, or *modelli* would incorporate a wider range of variety, as they would also incorporate larger scale drawings or profiles, not necessarily meant to being cut. Cooper refers to three Greek terms that were related to the execution of details: "*anagrapheus* and *hypograhe* (pertaining to two dimensional drawings, where the first indicates a template design and the latter has to do with drawing a full size profile on a surface in the construction site), and *paradeigma* (three

7 Modello: forma parallela al lat. MODULUD dimini. Di MODUS misuro (v. Modo). Rilievo dell'opera, che si vuol fare, forma piccola di un'opera da farsi in grande; Forma secondo la quale si tagliano o in cui si fondono i pezzi di un lavoro; per metaf. Esemplare, Prototipo, from the etymological dictionary online at: www.etymo.com. 15/08/2010.
8 Pérez-Gómez and Pelletier, Perspective Hinge, 105-107.
9 Ibid., 106.
10 Ibid.
11 Tracy E Cooper, "I Modani: Template drawings" in Brunelleschi to Michelangelo,494-500.

dimensional) models."[12] She suggests that drawing after classical monuments was part of the education and working process of an architect, and the architect's skill could turn into an inventive process. By emphasizing the *modani*'s significant role during the construction phase, Cooper suggests that they "became fertile fields for displaying the erudition and invention of the architect".[13] She highlights the role of the *modani*, not as utilitarian artifacts necessary for the construction phase, but rather as a device that reinforced the importance of the architect in providing a "graphic medium" through the construction process. Overall, by mainly referring to Michelangelo's *modani*, Cooper points to the significance of his drawings as defining a "paradigm" for *modani* which manifests different phases of a creative process.

In light of the discussions so far, I believe it would not be far-fetched to imagine that Francesco here, by making a reference to his variation on Fortresses, allows the drawings to produce different models. He makes the possibilities tangible in terms of the following categories.

INTERPRETIVE DRAWINGS: DRAWING AS HYBRID

To consider Francesco's **interpretive** drawings, which are mainly his drawings of the antiquity, it is helpful to briefly refer to the phenomenon of interpretation and its connotations during the Renaissance. During the Renaissance, the humanists' and artists' desire to align themselves with the past, resulted in the "rebirth" of antiquity. The rebirth was rooted in a genuine attempt on behalf of the thinkers and makers to understand the modes of operations of the past. The efforts invested in that understanding, inevitably lead to interpretations that became part of such undertakings by the humanists and the artists alike. Such interpretations turned to productive dialogues with the past, and resulted in a fusion of horizons. While the interpretations might have differed to a noticeable extent from the original works, the intention of aligning meaning was one that was true and genuine.

For qualifying Francesco's interpretive drawings, we must trace their roots back to his body of sketches at Uffizi, *Taccunio di Viaggio*[14]. This body of work makes apparent his avid desire to measure and draw the edifices of antiquity and to thus advance principles for himself and his audience, principles which were later reflected in his *Trattati*. The drawings of antiquity are appended

12 Ibid., 495.
13 Ibid., 494.
14 Di Giorgio, Francesco, Taccunio di Viaggio (archeological sketchbook), circa 1470 to 1480, in Uffizi, *Gabinetto dei disegni e stampe, Firenze*, 37, folio sides with annotated sketches of Roman antiquities mostly from Rome, Naples, and their surroundings. Also see chapter one, footnote 36.

to T1, but such a folio is missing in T2. However, it is important to remember that besides the drawings of antiquity, many drawings in the *Trattati* are either explicitly or implicitly inspired by or drawn from antiquity. Christoffer Ericsson's extensive study on Francesco's drawings of ruins[15] identifies the folios of drawings appended to the *Saluzzianus* manuscript as the earliest collected depictions of ancient architecture. In the first page of the appended folio to *Saluzzianus*, a depiction of the Coliseum, Francesco briefly describes his motive in gathering the drawings.[16] He claims that "driven by a fervent desire for those who want to innovate, who are pressed by the brevity of time they have…. I have succeeded with no little fatigue to investigate in Rome and the surroundings many various and noteworthy buildings that I have gathered, though many of them were in ruin and there was little left of their praiseworthy ornaments". He explains that "Of these buildings, I have drawn here plans, their circumferences and the ornaments according to my own weak *ingegno*…"

As we can see, Francesco recognizes the need to innovate as the main reason to undertake such a tedious task, implying that, to be able to create anew, a grasp of the principles of architecture of antiquity is essential. Of interest here is the use of the word *ingegno*, pointing to fact that since the ruined buildings were missing many parts, Francesco needed his creativity to imagine what the building would have looked like. Clearly, we can see that Francesco's motives are not associated with nostalgia, nor do his drawing methods pretend "objectivity". Interpretations, additions, and transformations would be expected. A similar passage occurs in the preamble of T2, where he articulates his reasons for such endeavours.[17] Francesco claims that "it became necessary in many circumstances and in considering the works of excellent Roman and Greek sculptors and architects, to reconcile the signified with the sign; and that results in retrieving, almost as if anew, the strength of the these ancient authors, mostly Vitruvius's…"

Much has been written about Francesco's struggle with antique material and his occasional misunderstandings. However, what should be emphasized is his recourse to drawing to revive ancient architecture, from its ruins. Here we encounter one use of drawing through which he deals with his

15 For full citation see chapter one, footnote 54.

16 Di Giorgio, Trattati, T1, F. 71: Tav. 129 [Pianta, alzato e sezione del colosseo.] "Unde mosso da huno acesco desiderio di volere quelle innovare, il che hessendo presso al fine in poco tenpo in tucto spente verranno, si per la vetustà loro ed anco per li molti et continovi ghuastatori et pertanto el meglio ched ò possuto non con piccola fatica investighando in Roma et fuore molti vari e dengni edifitti ho raccholto per benchè molto ruinati sieno et la dengnità degli ornamenti loro pocco se ne vede. De'quali edifitti qui socto fondi facce circunferentie et hornamenti loro sicondo el mie debile ingiengnio fighurati saranno..."

17 Ibid., T2, Preambolo, 295. "|…M1 v|Onde [me] è stato necessario per molte circonstanzie e per considerare le opera delli antichi Romani e Greci optimi scultori et architettori, concordando el significato col segno {verificando la concordanza tra segno (le parole adopterate dagli antichi autori) e significato(loro corrsipondenza con gli antichi monumenti)} , retrovare quasi come di novo la forza da parlare di più antichi autori, |S2| massimanmente di Vitruvio..."

discoveries, confusions, and dilemmas. His recovery of the theories of antiquity does not occur merely through description, but through drawing, as if the new medium is a better vehicle for rediscovery. As Richard Betts has shown in his dissertation, *The Architectural Theories of Francesco di Giorgio*, Francesco had the same attitude concerning texts, when he transformed and rephrased Vitruvius' words. Transformation and even misunderstanding of the texts and ruins gives a new life to buildings and methods lost to the passage of time. This particular use of drawing recalls the notion of hybrid, since *hybrida* was originally the offspring of a tame sow and a wild boar. Francesco's drawings of antiquity and his redrawing of them are indeed combinations of two or more different things, aimed at achieving a particular objective or goal.

While Maltese and later Payne have described Francesco's effort as that of an early archeologist due to his search for authority, here we find a much more open-ended and dynamic attempt at recording and reconciling the buildings and the writings of antiquity. In opposition to Maltese and Payne's qualification, Ericsson's term "adaptations of adaptations,"[18] bestowed upon the folios of antique architecture appended to *Saluzzianus*, takes into account Francesco's will to overcome difficulties, distances, and confusions by altering, adding, and thus transforming what formerly was missing. Francesco's tone in his preamble empowers the act of drawing, since it surpasses the functional aspect of a tool to simply note and record ruins, and supersedes its passive observational mode by raising it to the level of interpretation. Unlike observation, interpretation can create a separate identity for the partially lost sayings and buildings of antiquity. These drawings establish a dialogue with the past, since they also include the architect's own baggage of knowledge and beliefs. That is why, here, drawing attains the aura of a hybrid: a combination of the past and the architect's own invention. By this interpretation, the hybridity of Francesco's drawings of ruins fuses past and present; the remains continue their life in a new and autonomous mode disconnected from the limitations of decay.

In a compilation by Bruno Queysanne that brings together the surveys of Alberti and Raphael,[19] a letter by the Pope's secretary, Calcagnini, to Jacob Ziegler, is of interest since it brims with the joy and confidence associated with Raphael's act of surveying the ruins of Rome, an act which was to reestablish the lost glory of the city.[20] Even if the surveys were done with the prospect

18 Ericsson, Roman Architecture, 229.
19 For full citation see chapter two, footnote 106.
20 Ibid., 9. "Rafael est a présent occupé a un travail merveilleux qui paraîtra incroyable a la postérité. Il esquisse une reproductionn de la ville de Rome qui la présente reconstruite en grande partie selon sa forme antique, dans son première périmètre et dans les proportions de ses régions particulières. A telle fin, il a fait entreprendre des fouilles au sein des collines et des profondes fondations et il en a compare les résultats avec

of eventual restoration in certain cases, it seems that during the Renaissance there was more equivocation associated with the act of survey than in later, purely archeological endeavours. Architects surveyed as a way of studying the buildings of antiquity: in order to learn, document and, later on, use their findings.

In order to describe the set of drawings annexed to *Saluzzianus*, one must note their disciplined and rigorous[21] appearance. One example is shown in Figure 1, (T1, f. 71 TAV. 129; entitled: Plan, *alzato*[22] and section of the Coliseum) which represents the coliseum. Though the plan is distorted and inaccurate, many elements make the building recognizable. Figure 2, (T1, f. 78 TAV. 143; entitled: Façade of Part of the *Recinto* – a limited part of a sacred space – of the temple of Minerva) displays an elevation with a slight recession, so as to show the depth of the elements that compose the elevation. The recession is systematic and careful, and even though the ground line that makes the first step is inconsistent, this drawing is a solid example of an orthographic view, with a hint of depth. Figure 3, (T1, f. 80 TAV. 147; entitled: the interior of the Pantheon and details of the decoration) is certainly one of the most elaborate drawings in the folio, showing the interior space of the Pantheon in perspective. While once again the proportions are optically 'incorrect', the attempt of the author to detail the drawing as much as possible is praiseworthy. One could even argue that the drawing conveys better the experimental dimension of the building, the 'poetic image' embedded in the building and communicated to the mind's eye, than would ever be possible through a 'correct' perspective drawing. Here, Francesco attempts to draw the dome and the lower floor in a slightly off-centre perspective. The same struggle with the converging point, and thus the question of eye level, persists. However, the elaborate details and painstaking attention make up for the inaccuracies. The figurative detail below the plan is also of special beauty: the detail starts off at the right side of the section and extends beyond the left side by a small margin. Overall, the intention seems not to draw this interior view perfectly symmetrically from a converging point to show the divisions of the dome: the unsymmetrical configuration on the ground floor is due to real differences in the spaces of the ground floor.

Figure 4, (T1, f. 88 TAV. 163; entitled: Interior and Plan of *Santa Costanza*, plan of a building close to *Santa Maria* in *Aracoeli* and plan of the cistern «*alle capocce*» (?)), shows a few drawings in one

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les descriptions et les mesures des auteurs antiques. Ce travail a rempli le pape Leon et tous les romains d'une telle admiration, qu'ils sont tous a considérer son auteur comme un être supérieur envoyé du ciel pour rétablir la ville éternelle en son ancien majesté."

21 The words "discipline" and "rigour" here should not be understood as systematic and rigid qualities but as characteristics of drawings that demonstrate fairly consistent qualities as a whole.

22 *Alzato* is equal to *prospetto*, meaning either a façade, or a view of a building; it literally means raised up. In this case the general view (perspective) is intended.

page. On the top part of the page is a plan, and this time a sectional perspective of *Santa Costanza*. The lower part depicts the plan of a building and that of a cistern. The most ornate drawing of the lot, the sectional perspective demonstrates the outer profile of the building juxtaposed to the inner divisions. Compared to the Pantheon drawing, this perspective seems less systematic. However, much care is taken in depicting the dome and the sculptures surrounding the *tiburio*. On the ground floor the perspective is slightly off-centre; however, here it seems more like a mistake or a miscalculation, judging by the appearance of the two upper floors.

So we see one facet of drawing as a process that starts as a survey, which is then compared to other sources and modified and interpreted in order to revive a particular past. The flexible and dynamic nature of this kind of survey by Francesco makes the drawing a more malleable tool that does not mimic, but creates anew. Although earlier efforts by Brunelleschi, Alberti, and others were precedents for Francesco's own research, nonetheless his appended collection and his insistence in folding his findings into the *Trattati* are particularly important. His interpretations surpass the instrumentality of survey and turn into hybrid creatures, half ancient and half modern, rooted in the past yet influenced by the architect's hand and mind and thus connected to the present.[23] This type of drawing then becomes a dynamic response that resonates with the buoyancy and boundless character that Francesco associates with the notion of invention.

The capacity of drawing as poetic image of the building was previously mentioned. In *Peoetics*, Aristotle elaborates on the difference between history and poetry by stating that while history describes what has already occurred; poetry tends to "what would happen".[24] He explains that if the poet decides to take on a historical theme or subject, that does not lower his statue as a poet, as "there is nothing to prevent some of the things which have happened from being the kind of thing which probably would happen."[25] Aristotle's formulation of the reciprocity between the historical and fictive narratives is an important one in understanding Francesco's drawings of the ruins. The drawings that emanate from his pen are both "fictive" and "historical". They refer to things that have already existed, and yet suggest what may happen at the same time.

23 It is important to clarify that the use of the word hybrid does not intend to qualify Francesco's work as creating uncanny combinations. I believe that in drawing the ruins and adding his own vision of these buildings, Francesco is merely, but genuinely, interpreting.
24 Aristotle, Poetics, Translated with an Introduction and notes by Malcolm Heath, (London: Penguin books, first edition 1996), 5.5. 51b, 16.
25 Ibid., 17.

Francesco's **theoretical** drawings include those that represent concepts, both received and transformed, demonstrating central questions of architectural meaning and its relationship with religious notions and cosmographic representations. While implemented in one way or another in his architectural projects, the drawings are also autonomous entities. By identifying this series of drawings as theoretical, we focus on the spontaneity of the term theory, associated with and shedding light on practice. In his dissertation, *Francesco di Giorgio On design of Churches,*[26] Lawrence Lowic suggests that the anthropomorphic image of the church contains ideas from both Greco-Roman times and Francesco's own era. Lowic claims that Francesco's attitude regarding the verbal record is a "frame of reference"[27] and suggests that he aimed at materializing his thought by means of *disegno*, based on a "compound of classical prototypes and the more immediate tradition of his time."[28]

Francesco's drawings in this category have several dimensions. First, his theory of human analogy is imbued with the power of analogy. This was used before him by Filarete (albeit in words), and is a recurring theme for Renaissance humanists, most specifically for Pico della Mirandola. The reference to man and his proportions, but also his abilities and potential, with respect to architectural practice had been part of architectural tradition since the time of Vitruvius. However, during the Renaissance both Filarete and Francesco emerge as having pushed the analogy between man and building further in their respective theories. Filarete likens buildings to human beings in more than one way when he describes their likeness to different states: of being healthy or sick. He also suggests that buildings are able to fall in love, or even die. Francesco, on the other hand, takes a more literal approach, as he superimposes images of man's body or organs on the whole or on parts of buildings, hence the qualification by many scholars of Francesco's drawings (of that specific kind) as literal.

In an article that expands on Francesco's theory of human analogy,[29] Lowic contextualizes Francesco's use of human analogy by showing the relationship initiated with Vitruvius and continued through the Christian tradition. He points to the example of Dinocrates' shaping of Mount Athos, a concept borrowed from Vitruvius, which acquires a new depth in Francesco's illustration. Here it suggests a literal correspondence between the human body and different parts of the city. In the third

26 Lawrence Stephen Lowic, "Francesco di Giorgio on Design of Churches." Ph.D. diss. Yale University, 1976.
27 Ibid., 126.
28 Ibid., 127.
29 Lawrence Stephen Lowic, "The Meaning and Significance of the human Analogy in Francesco di Giorgio's Trattato," The Journal of the Society of Architectural Historians Vol. 42, No.4, (1983): 360-370.

chapter of *Saluzzianus*, Lowic shows that Francesco moves from general considerations to the analysis of different types of cities. While Francesco borrows the principle of means and measures from the human body, he diverges from Vitruvius since he uses these perfect geometric forms as the basis of his city plans. Lowic emphasizes that Francesco's use of human analogy does not halt at showing a mere resemblance to the human body: he uses the analogy to refer to the fortified city in terms of its provisioning, beauty, and government.

Lowic confirms that Francesco's implications of human analogy are less of an influence by Vitruvius than the result of a continuous philosophical tradition which constantly found references between man and the state. Beginning the lineage with Plato and Cicero, Lowic traces it into Christianity via Augustine and Thomas Aquinas, claiming that as man was the link between the common property of the state, the cosmos, and the microcosm, the relationship between man and the others was understood as likeness (*similitudine*, for which Francesco offers the vernacular term of *guisa*), and was implemented in a range varying from the most literal to the most abstract.

Lowic emphasizes that, among others such as Augustine, Thomas Aquinas, and Gianozzo Manetti, Nicholas of Cusa in particular influenced Francesco's theory of human analogy in his church designs. In his *De Docta Ignorantia*, Cusa had already added to the idea of man as a microcosm the claim that Christ was its necessary and ideal realization. Lowic states that Francesco's demonstration of naked figures of man as a microcosm were intended as likenesses, whose specific proportions were less important than their complex of associated meanings. Lowic believes that Francesco's refined ideas manifested in *Magliabecchianus* were based on a Christian interpretation of Aristotle and his followers, which he calls more illuminating than that of *Saluzzianus*.[30] Lowic argues that Francesco's point of departure in *Magliabecchianus* becomes the nature of man. Man is the efficient cause of architecture, but human nature determines its final cause. Together they are primary factors in shaping architecture's formal cause.

Lowic's point of view is key to the present discussion as it underlines the origins of Francesco's drawings, at least in their initial phases, in analogy. In that sense, the literal quality of these drawings corresponds to their analogical nature: the association of building elements and man's body resonates immediately in the reader's mind. In fact, the literalness of these drawings makes them memorable, since they startle us with their uncanny superimpositions. Lowic's point about the

30 I believe this refinement of ideas should be understood thus: Francesco obviously showed great interest in the theory of human analogy by the drawing we find in his *Opusculum*, yet *Saluzzianus* shapes his instincts in a raw form. Education in Urbino and the years of grappling with Vitruvius and other texts, specifically Aristotle, resulted in Francesco's placing his initial ideas in a more philosophical framework.

trajectory of Francesco's drawings, transcending their mere analogical existence and entering the realm of metaphor, is quite significant. The intricate interweaving of Aristotelian, Christian and medieval beliefs and concepts in elucidating the correlation of man to architecture in general, and to that of the church in particular, is in great part absorbed by Francesco. However the specificity of Francesco's treatment of the subject matter calls for a brief elaboration of the notion of metaphor as the organizing structure of his drawings of human analogy.

Aristotle describes metaphor in two works specifically: *Poetics* and *On Rhetoric*. In *Poetics*, he describes a metaphor as "the movement of an alien word from either genus to species, or from species to genus or from species to species or by analogy."[31] In his note on Aristotle's *On Rhetoric*, George Kennedy explains that that the word *metaphora* means "carrying something from one place to another, transference".[32] In *On Rhetoric*, Aristotle qualifies metaphor as something that has "clarity and sweetness and strangeness, and its use cannot be learned from someone else."[33] In another instance he offers that metaphor is to be used in "naming something that does not have a proper name of its own", and is to be taken either from things that are related to each other or are of similar kind in order to maintain clarity. In qualifying the source of the metaphor, Aristotle claims that it "should be something beautiful".

The drawings that combine and juxtapose man and building can also be understood as metaphor, a figure of speech in which a term or phrase is applied to something to which it is not literally applicable.[34] This interpretation brings to mind yet another word, simile[35], which asserts similarity though not identity. In either case, Francesco brings together two different elements, man and architectural components, to create rules of design. In this lies his intention to arrive at a theory that he and others could use. Thus, the drawings cannot be taken as finished images; rather, they demonstrate the architect's method or understanding of *disegno*. If we look at the different potentials that a drawing can offer through making an analogy, advancing a metaphor, and acting as a simile, we can conclude that Francesco's use of drawing as a tool is sophisticated compared to his counterparts then and later. In particular, his cunning use of different forms of drawing demonstrates both awareness, and a struggle that is singular.

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31 Aristotle, Poetics, 1475b, also see Paul Ricoeur, The Rule of Metaphor, Translated by Robert Czerny, Kathleen McLauglin and John Costello, (Toronto: University of Toronto Press, 1977), 9-43.
32 Aristotle, On Rhetoric, introduction by George Kennedy.
33 Ibid., Book 3, Chapter 2, 1405 a, 200.
34 A figure of speech in which a name or descriptive word or phrase is transferred to an object or action different from, but analogous to, that to which it is literally applicable; an instance of this, a metaphorical expression. The Oxford Dictionary of English Etymology, Electronic resource, Oxford University Press, 2003, http://www.oxfordreference.com. 01/04/2010.
35 Simile is a comparison of one thing with another, esp. as an ornament in poetry or rhetoric. Ibid.

In "The Architectural Theory of Francesco di Giorgio",[36] Henry Millon states that the first distinction between Francesco and other theorists is that mathematical procedures used in his designs are documented and therefore can be studied. Comparing Francesco with Alberti and Filarete, Millon claims that Francesco's modular principles constitute the most extensive and detailed set provided up to that time. He reminds us that Francesco's modules are "large enough to be used for the basic orderings of a building,"[37] and creates a threefold categorization for them: first, the arithmetical method, involving a predetermined number of parts; second, a geometrical method that uses a geometrical construct to determine the unit for a modular grid; and, third, a method that involves the diagonal of the square and of the double square. Millon finds the last method an attempt to achieve a nonempirical Renaissance module based on a medieval geometrical construction.

Millon describes Francesco's two systems of dividing the body: one the system of seven divisions based on the head height, the other a nine-and-one-third module based on face height. Referring to discrepancies between the two systems, Millon states that Francesco uses the human body as the guide to establish a system. He then refers to the lack of wall thickness, and questions the correct way by which Francesco establishes a wall — be it inside or outside Francesco's diagrammatic lines — and its thickness[38]. Millon then compares the result of superimposing Francesco's design for the church of Santa Maria del Calcinaio in Cortona on his drawings in the *Trattati*, finding some correspondence and some divergence. Troubled by inconsistencies arising from the comparison, Millon states that the study of work by Francesco, who was not an architect "generously endowed with talent,"[39] can inform us about the general practice of architecture[40]. He then points to Francesco's disregard for the application of abstract thought, claiming that the framework of derivation and implementation of proportions based on geometrical or arithmetic divisions was not faithfully followed by Renaissance architects. Therefore, Millon claims that the final adjustments were made by the architect's eye, affording a freedom that departed from faithful adherence to theory. While Millon's study of the correspondence between Francesco's theoretical drawings and one of his projects is interesting, I believe there is something about the intention of "finding consistent logical

36 Henry Millon,"The Architectural Theory of Francesco di Giorgio," in Renaissance Art, Ed, Creighton Gilbert, Harper Torchbooks 1465 (New York: Harper and Row, 1970), 133-148. Originally published in The Art Bulletin, Vol. 40, No. 3 (Sep., 1958), 257-261.

37 Ibid., 135.

38 Some suggestions are offered in Richard Betts' article about structural issues in the Renaissance, discussed later in this text.

39 Ibid., 145.

40 Millon does not further elaborate on why he chose this classification.

systems" that is misleading.[41] It is clear that a theory is not directly transferable to a built project, and therefore it would be unfair to seek an exact relation between the diagrammatic drawings of the *Trattati* and the built projects. Also Millon's statement about final adjustments, while correct in principle, denies all the other factors that are in play in a project, such as site and program, by simply stressing the visual, which fails to do justice to Francesco's considerations of elements other than sight.

Figure 5 (T1, f. 3 TAV. 1; entitled: Figure and various constructions), depicts a man and the city superimposed. One of the most conspicuous sketches of Francesco, in which the city is referenced to the body of a man, the pairing of the body parts and the functions of the city are meaningful: the hands and feet articulate the surrounding wall, the situates the centre of the main *piazza*, and the watch tower is located on the head. Of interest is the combination of different views and elements. Figure 6 (T1, f. 14v TAV. 24; entitled: Column, capital pilaster), superimposes figures on columns, and embeds the story of the creation of each style with an illustration. Next to each figural depiction is also a bare architectural drawing of the same column, showing both the source of inspiration and its results. Figure 7 (T2, f. 38v TAV. 228; entitled: Scheme of the proportionality of the façade of a temple with a longitudinal plan) clearly depicts the relationship between a standing man's body and the divisions and proportions of the church's façade. Compared to the some of the most figurative examples in T1, this drawing, along with the two drawings of Figure 8, clearly and concisely depict the relationship between body parts and architectural elevation and plans. There is more emphasis on the geometric qualities of the divisions, with the circles and the oblique lines, making this drawing highly comprehensible. Figure 8 (T2, 42v TAV. 236; entitled: Anthropomorphic proportionality in plan of a temple with longitudinal plan, division of the human body's height in nine or in seven parts) is related to Figure 7 and shows the divisions of rectangular church plans in to nine and seven parts. The drawing of the nine parts is more elaborate, and it is unclear whether this shows the author's preference for this division.

Last but not least, Francesco's personal style has bestowed a unique metaphorical quality on the drawings and text since they emphasize and empower each other to make the connections more apparent. Figure 9 (T2, f.27v TAV. 210; entitled: Reconfiguration of Mount Athos according to Dinocrates) depicts the story of Dinocrates. As Kemp[42] shows, in the retelling of the Story of Dinocrates, Francesco's take on the story is much strengthened by the image and the use of the words; he reconnects it to his own theory of human analogy, since it uses the body of an architect

41 Ibid., 148.
42 Kemp, Mimesis to Fantasia, 365.

superimposed on the city. The choice of imagery creates a strong metaphorical character, making it poetic. In this category we encounter examples of drawings that are part analogy, part simile, and part metaphor constituting some of Francesco's most personal and celebrated drawings. If we return to the reference Francesco makes to the importance of memory in the architect's education and also remember his insistence on the mind's eternal search of *virtù* through infinite invention, we see that his hand and mind are at work to exploit the infinite possibilities offered through the act of drawing. As well, the drawings' power helps us to relate to and remember them.

INVENTIVE DRAWINGS: DRAWING AS SPECTACLE, DISPLAYING BOUNDLESS INVENTION

Francesco's **inventive** drawings include drawings of machines, fortresses, and military architecture. These drawings exist in the early *Codicetto*, the *Opusculum di archtitettura*,[43] and the copies of *Trattati*. Even though at first sight categorizing such different entities under the same label seems odd, these groups have more to do with each other than what appears at a first glance. First of all, defying the more main stream line of practice, all of these drawings belong to areas that are adjacent and complimentary to architecture. Being mindful that not all the drawings in this category are authentic inventions, since some where copied from Taccola's depictions of Brunelleschi's machines, Francesco calls the machine drawings his inventions, and by the same token, his fortresses were unique and unprecedented. A study of the meanings and implications of the term *invenzione* appears in the previous chapters,[44] yet it should be restated here that theme in Italian also relates to *invenire*, which means to come across or fall upon something. Although some of the machines were used for practical reasons, Scaglia claims that the *disegno* of each machine should be understood at face value, as each drawn machine was destined to remain "illustrated instead of what it [the machine] would look like if built or how it would be fabricated."[45] Scaglia considers Francesco's drawings entirely imaginary because of the intricate combination of their wheels, valves, pumps, and the like.

So here we encounter machines depicted for use during the Quattrocento and machines as graphic curiosities, objects one should marvel at. Concerning Francesco's military architecture, Let us remember that in Filarete's book, a rare example in which the Prince dictates the design for the fortifications of the city since he has more knowledge than the architect, is an indication of the value of specific military knowledge. Francesco's expertise in matters of fortifications and military

43 The *Opusculum* was conceived some time circa 1470-75, Codex 197 B1 (MS HARLEY), British Museum, London, (88 Folios mainly containing engine drawings and fort plans). See chapter one, footnote 31.
44 Notions of invention have been discussed already in chapters two and three.
45 Scaglia, Checklist, 9.

architecture, together with his engineering ability as an inventor of machines, are of outmost importance. If we partially accept Scaglia's theory and take Francesco's drawing as a means to show his ability to conceive and build military architecture and machines, nonetheless his machines are not mere visual ploys to seduce or convince. Instead, as Scaglia elsewhere states in relation to Leonardo's drawings of machines, the act of drawing is a mode of inquiry and study for the architect, while it also amazes and convinces a potential patron. So here we encounter another facet of drawing, that of both a spectacle and a method of thinking. As with the notion of time, it seems that these drawings embed elements of time both present and future since they engage the mind in the present spectacle within the space of drawing and of the future; they suggest, no matter how far from or close they are to practical matters, a potential life outside the boundaries of the drawings.

Although departing from a seemingly rational and scientific basis that relies on the logic of gravity and mechanical knowledge, Francesco's machines are inventions that expose us in their drawn form to potential functions communicable only through drawing. In this regard, his drawings are not blueprints for construction, but rather visions taking shape through the architect's hand and mind, by *ingegno* and invention together at work. Specifically, in drawings such as the few cars depicted in *Saluzzianus*, or those of men flowing on top of waters, it is hard to judge the drawing only as a pragmatic response. They are closer in nature to his pictorial work in that they acquire a fantastic quality and thus distance themselves from the purely operational nature of a blueprint.

In her dissertation on Francesco's Machines, Alice Guess suggests that understanding Francesco's machine drawings might be fruitful in developing a different attitude towards architectural practice in our contemporary world.[46] The drawings, despite their limited mechanical depictions, offer a general demonstration of machines. Since Francesco's drawings and text function beyond the limits of working drawings and descriptive text, Guess suggests that they reconcile possibilities of realization or the act of description (which she associates with theory), with the act of construction, which is connected to practice. According to Francesco, describing things either by text or drawings is difficult; nonetheless text and drawing will merge in the imagination of the architect[47]. Guess claims that the relationship between text and illustration is reinforced even further by the writing, as the text systematically refers to the image, starts and ends with it, and indicates a precedence of drawing over text. She argues that Francesco's illuminations should be considered as an important stage, since illuminations served to augment the text and help the readers to recall it and

46 Alice Guess, "The Machines of Francesco di Giorgio: Demonstrations of the World," Master's diss. McGill University, 1998.
47 Di Giorgio, Trattati, T1, Leve Di Ruote e Mulini, 142.

go beyond mere illustration. While part of Guess' argument is correct, in that a certain portion of drawings were pre-existing to text (such as the machines and the ruin drawings), I would argue that more important factors indicating Francesco's priorities are the statements one finds in the *Trattati* in relation to the act of drawing.

To briefly point to a few inventive drawings, let us look at a few examples: Figure 10 (T1, f. 62v TAV. 116; entitled: Ladders for attacking the walls) depicts different scenarios with regards to war apparatus. On the right there are two different ladders, supposedly for the different heights. All four drawings are arranged such that one can understand the different parts and the mechanism. Figure 11 (T1, f. 66v TAV.124; entitled: Modes of lifting water from the wells, four-branch *pontone*, swimmer with a rubber ring and oar, diver) depicts different machines, and components that have to do either with extraction of water or flotation. The two figures on the right, one depicting a diving device and the other a rubber ring and oar, demonstrate how one is to make use of the device in question. Figure 12 (T2, f. 79 TAV. 295; entitled: Fortress with main triangular tower pointing to the outside and semicircular towards the inside of the circuit) demonstrates a fortress, from a raised view point, which affords to demonstrate all the strategic areas, stairs, and walls. Figure 13 (T2, f.91v TAV. 318; entitled: Winch with ropes with endless screws end moved by horse, winch with rope moved by endless screws.) demonstrates two detailed drawings, in parallel projections, and the upper drawing includes a horse that gives a scale to winch. All of the drawings share the same purpose of demonstrating the 'functioning' of a specific machine, or place, yet by the mode of illustration, they also give the viewers hints about use, and scale at the same time.

Of interest in these series of drawings is a similarity to some of Francesco's figurative work, such as Atlante, as well as some of Francesco's paintings such as the *Coronation of the Virgin*, in which human bodies are entangled with natural forces in ways that lean towards a mystical relationship between men, separate or combined invisible or visible forces, and the cogs and wheels of the machine.[48] The presence of these figures in some of the machine drawings, depicted in poses and situations that connect them to the human bodies of *Trattati*, hint at some apparent or hidden relationship between them and the cosmos. They surpass by far mere operational or functional considerations. Francesco's human beings do not operate the machines; they hover, cling to, or are connected to machines in ways that are more associated with the fantastic than that of the operational. Human beings that hover above and beyond the machines, as if they are frozen in eternal interaction with invisible forces, do not seem to operate the machines so much as engage with

48 In her dissertation, Alice Guess describes that particular drawing, by interpreting Francesco's intention as making a prayer machine. Guess, Machines, 53-61.

them and with predestined movement as a part of cosmic performance, reminiscent of Francesco's troubling tensions between the Virgin Mary and Jesus in the *Coronation of the Virgin*, or his depictions of Atlas and Hippo.

"FORM" OF DRAWINGS

A discussion of Francesco's drawings would be incomplete without attending to their formal characteristics. In the context of this discussion, formal is understood as the manner in which drawings depict architecture, whether a drawing is an orthogonal view, plan, section, or elevation, or a converging or parallel three- dimensional view. It also includes observations about the inclusion or exclusion of figurative elements and the rendering of the drawings.

There are two general characteristics of great originality in the drawings of the *Trattati*. One is Francesco's strategy of superimposing different figures on architectural fragments or parts. The notion of superimposition becomes more intriguing when one understands its complexity in Francesco's drawings. His superimpositions are not always of the same views and the same planes. The second original characteristic is a curious shift between the relative discipline of the architectural drawings in *Trattati*, and the more expressive representations of machines and fortresses often represented in three dimensions. By looking at the drawings, it becomes clear that the implicit rules that are used to show architectural elements – from the plans, elevations, and occasional one-point perspectives, from whole drawings to parts, details, and fragments – follow a certain set of principles, making for a more or less disciplined rigour in their treatment. However, once we look at the drawings of machines and fortresses, it becomes clear that the author intends to engage other forms of representation that follow a different logic. Francesco modifies and alters those drawings in order to show what he deems essential. These alterations include drawings that have more than one converging point (*punto centrico*), to which the lines of the perspective recede, or axonometric views in which the relation of the parts seem exaggerated in terms of scale.

FANTASTIC SUPERIMPOSITIONS, COMPOSITE VIEWS

Francesco's drawings often incorporate human figures, testifying to his interest in anthropomorphic architecture. The literal implication of bodies superimposed on top of architectural elements, be it the city, the fortress, or a column, is worthy of reflection. Prior to examining the more specific

context of the *Trattati*, it is worthwhile to look at the broader cultural context of anthropomorphic architecture.

In *Body and Building*, a compilation of essays relating human body to architecture, Dalibor Vesely elaborates on the notion of embodiment and its implication on architecture.[49] Vesely traces back the lineage of anthropomorphic architecture all the way to Vitruvius's analogy of the human body to the body of the building. In the third book of *De Architectura*, Vitruvius initiates is discussion of designing temples by pointing to a need for symmetry and proportion without which "there can be no principles in the design of any temple; that is if there is no precise relation between its members, as in the case of those of a well shaped man."[50] Vesely identifies the origin of the Vitruvian comparison in a "radicalized, and in a certain sense distorted Aristotelian understanding of corporeality."[51] He further explains that as for Aristotle, there can be "no action without contact"; the significance of contact, as well as "position, existence in place, lightness and weight"[52] becomes part of Aristotle's notion of corporeality. Vesely suggests that Aristotle's notion of corporeality results in almost every thing, even the soul and the divine, attaining a material substance. He adds that for both Plato and Aristotle, body was understood and discussed as always "linked to the soul"[53], leading to a global understanding of the reality of the world.

By referring to Aristotle's identification of the human body as a "*microcosmos*", and the world as a "*megalocosmos*", Vesely reminds us that this specific formulation is at the root of the later medieval understanding of man as "*minor mundus*".[54] Vesely therefore frames this understanding of human existence as seen as "a drama played out on a cosmic stage", and recognized in the human body.[55] Vesely argues that even though such proximity would be challenging to the modern way of thinking, nonetheless the possibility of understanding the depth of this supposed closeness of their "common corporeality and meaning" could be profoundly rewarding. He suggests that this proximity is to be

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49 Dalibor Vesely, "The Architectonics of Embodiment", Body and Building, Essays on the Changing Relation of Body and Architecture, Edited by George Dodds, and Robert Tavernor (Cambridge, MA: MIT Press: 2005), paperback edition, 28-43.
50 Vitruvius, Ten books, Hicky Morgan Edition, III, I, 1. 72.
51 Vesely, Architectonics., 30.
52 Ibid.
53 Ibid.
54 Ibid., 31. Aristotle's is in Physics, 252 b26 is "If a living body or thing is ever absolutely at rest, we shall have a motionless thing in which motion is originated by the thing itself and not from the without. If this can happen to a living thing, why not the universe? And if in a smaller cosmos, why not with the larger cosmos?"
55 Ibid.

understood as that of embodiment, since ultimately the "reality of the world" is only understandable through "degrees of embodiment", revealing various levels of reality.[56]

Vesely argues that the analogy between the human body and the world should be understood through the study of the relationship between body and architecture. He suggests that since for Aristotle, the body is always associated to a place, it implies notions of position and spatial hierarchy; yet it also underlines the importance of all these notions with regards to their animation by the soul. Vesely criticizes modern times in its failure to distinguish between "sense and intellect and a naïve belief in the ability of sight to see intelligible reality directly, without any mediation with sensible reality."[57] By referring to Biaggio Pelacani di Parma's *Questiones Perspectivae*, in which he expands on the judgment of sense, and the ability of sight to be able to grasp things similar to the intellect, Vesely argues that such an "immanentization of the soul", results in understanding it as something like a corporeal substance, It thus makes it equal to the body. By referring to Francesco's drawings, and Alberti's *De Statua*, Vesely identifies them as understanding the soul as the center of gravity for the body, rooted in an Aristotelian understanding of the notion of animation.

Posing the question of what would transcend a superficial analogy between architecture and the human body Vesely claims that a plausible answer could only come from the understanding that such an analogy is meaningful in the reality of embodiment. In other words, he claims that the relation of the micro and macro cosmos happens in an embodied experience of the world, and he qualifies the representation of such an understanding as "by definition derivative and secondary".[58] Vesely insists on the 'symbolic' nature of such a representation, as it brings two essentially different phenomena together. The most essential point of Vesely's argument with regards to this discussion is his insistence on understanding the relationship between body and soul, just the same as the body to the world, to be understood as an 'analogy' which retains the difference between the elements.[59]

Vesely argues that the inherent symbolic nature of this analogy is at the core of its strength and its ability to mediate between the soul and the body, and the "intelligible order of the reality and its visible corporeal manifestations". In short he argues for understanding the value of this analogy at the ontological level and not at the merely operational level. He reminds us that the concepts driven

56 Ibid., 32.
57 Ibid., 33-34.
58 Ibid., 35.
59 Vesely argues that the transformation of this analogy through time, and its evolution into a more abstract and thus removed metaphor has been detrimental to its original sense. Vesely claims that the weakening of the transcendental nature of analogy and its reduction to a merely corporeal analogy has inherently undervalued its power: to the point of entirely robbing it of its essence.

from such an analogy, namely order, proportion and harmony, have been established based on mediation. By pointing to proportion specifically, he reminds us that beyond mere numerical relationships, proportion is at the core an analogy itself. Vesely states that analogy, articulated through mathematical proportion, is the territory of the language originally.

Vesely's suggestion in understanding the nature of the analogy between the human body and architecture as one that engages the sense and the intellect (or the soul and the body) simultaneously is critical to an examination of Francesco's drawings of human analogy.[60] In order to make tangible the notions of symmetry, proportion and harmony, Francesco superimposes figures on top of buildings. This practice in itself is worth dwelling upon for a little while. The effectiveness of the superimposition as a technique in harnessing the two seemingly different elements, human body and architecture, seems rather evident. This is perhaps the reason that Francesco's superimpositions have been called literal, as they juxtapose the human body to the body of the building. However these superimpositions preserve a distance between distinct entities, as they reveal their inherent differences in their visual manifestations. Therefore, though literalness exists on the surface, analogy allows for a deeper, more complex interrelationship of the two superimposed entities. Also, a more careful observation suggests that even though Francesco superimposes human figures and architecture, he always seems to be conscious about the distinction between the two.

The theme of analogy as a vehicle of mediation between two entities can be carried through in Francesco's variety of planimetric versus frontal depictions of the superimposed elements. He some times juxtaposes a planimetric view of a building to the frontal view of a man; at some other time, the same view of a man is referenced to the elevation of a building. It might therefore appear that the same body, with the same proportions and posture, is used for both a frontal and planimetric suggestion, such as is the case in figures 3 and 4 discussed previously. Similarly, in other examples (such as the capitals), the face of the man and woman and the face of the capital are reciprocal. One cans see this in Figure 14 (T1, f. 15 TAV. 25; entitled: columns, capitals, bases) and Figure 15 (T2, f. 33v TAV. 220; entitled: Corinthian capital and its proportions). It is necessary to reiterate that in

60 In the theoretical scene of Quattrocento, Filarete, the closest to Francesco in bestowing an anthropomorphic nature on buildings, likens the conception and birth of the building, as well as its states of being, to that of the man. Filarete's drawings nonetheless remain rather controlled and conservative in comparison to the boldness of his text. Though he writes of buildings that fall in love, get sick, and may eventually die, Filarete's illustrations do not display such characteristics. Although Filarete's analogies surpass by far the allusions of Alberti and Vitruvius, and are much closer to Francesco's, his statements remain pure fantasies that are limited by words, and only appear faintly in his drawings. It seems that what Filarete's fantastic tales evoke of the proximity and similarity of man and architecture, Francesco, submitting to the sense of sight and empowered by his boundless invention, actually depicts.

most cases the juxtaposition is neither willful nor accidental, as it often targets one or more architectural characteristics such as proportion, order and symmetry in borrowing from the body.

To this one should add the range of less-expected gestures such as the juxtaposition of more than one view in the same drawing, as in the previously discussed Figure 5. This image depicts a man superimposed on the city. This so called "violation of the perspective rules" as referred to by Nicholas Adams in his article on Francesco's military architecture[61], is in fact no violation if we understand that the body and the architecture are to reference to each other and not to establish a one to one correspondence. Here we can see that not only are the frontal view of the man and the planimetric view of the fortress walls and *piazza* distinguished; but also that suddenly the head, crowned with the *roca*, presents a foreshortened three-dimensional view. One might be tempted to read such instances in Francesco's drawings as anomalies, However the drawing makes sense, as it makes the hierarchy and the importance of different elements manifest by giving them different visual appearances.

The last type of such superimposition, which is uniquely presented in the drawing of Dinocrates, Figure 9, displays yet a different facet of Francesco's ability. At first sight, the drawing appears as a figurative illustration. However, if we remind ourselves that the drawing simultaneously depicts Dinocrates with the skin of the lion hanging from his shoulder, and Dinocrates' creation as the carving of Mount Athos in the shape of a man, we can see that this time a referential loop of analogy is made possible by the content-oriented superimposition. As the variety of such superimpositions demonstrates, literalness is not to be taken lightly. I have previously referred to Martin Kemp's comment on this particular drawing, in which he argues that Francesco develops this story in terms of macrocosm and microcosm: Mount Athos is compared to the human body, and the king's satisfaction emerges from the likeness of the body and the city. Kemp argues that Francesco's retelling of the story, both in verbal and drawn form, creates three levels of analogy: "between the body of the earth, the body of man and the form of the city." [62]

Although the body has been used in many instances as a source of inspiration to convey measure, proportion, harmony, and balance in architecture, the novelty in Francesco's work is the effect that architecture in turn acquires a body, sheltering it, embracing it, or at times tightly constraining it. The theory of human analogy is not a one-sided path starting with the body and ending in architecture. Francesco's drawings, as well as his words, show a more complex and cyclical

61 Nicholas Adams, "L'Architettura Militare di Francesco di Giorgio," in Francesco Architetto, 134.
62 Kemp, Mimesis to Fantasia, 353.

feedback loop in which the body and architecture constantly affect each other as though they are part of a magnetic field, making it hard to distinguish where one's influence on the other starts or ends. The flexibility of Francesco's bodies ensures their active presence, animating the drawings and thus the spaces of architecture. While the body is enveloped by architecture in his fortifications or church drawings, simultaneously architecture seems to originate from the body. His depictions show how tight the relation is between the columns and the body as opposed to the more relaxed position of the church, in which the human stands normally.

In the next passage[63] Francesco continues his analogy to further strengthen the case for the similarities that exist between the human body and that of the city by emphasizing the importance of things to be measured and judged by our eyes' mind. Extending his analogy to the kind of injury and sickness that might become fatal to the body, he claims that "if the body is falling into a minor or a serious illness, it should be repaired soon, and if not by itself, then by the help and counsel of the doctor; hence when we see that a small maltreated wound can become deadly, unlike a severe wound that can be cured with prompt and diligent care." As to the city, Francesco advises the governor to be diligent in keeping a watchful eye on the city.

Although these passages are sensible and make the subject more concrete, they do not offer precise architectural information related to the body. The next paragraph from the chapter on cities in T1, Figure 5, as well as Figure 16, (T1, f.6v TAV. 8; entitled: Plans and perspective of fortresses, start of the chapter on cities and drawing of the human body inscribed in a square and circle) is more pertinent. In the following passage, Francesco first names *ragion* (reason), *misura* (measure), and *forma* (form), which the city shares with the body, as well as qualities such as *circumferenzia* (circumference) and *partizione* (partitioning, division).[64] Francesco starts by claiming: "A city has the purpose, size, and

63 Di Giorgio, Trattati, T1, Fortezze, 3-4. "|...T3|E Siccome noi vediamo che l'uomo ha due occhi co'quali vede e conosce le cose apparenti, così come ha gli occhi visivi debba avere li occhi mentali, I quail sieno guida e via d'intelletto di giudicare e conosciare le future cose. Imperò, se vede e cognosce incorrire il corpo in qualche piccolo o grave infirmità, a essa presto riparar si debba, e se non per sé, coll'aiuto e consigli del fisico[medico], imperò che noi vediamo una piccolo ferita mal curate spesso divenire mortale, e così per contrario una grande e grave con sollecita e diligente cura spesso sanarsi. Così el governatore e rettore della città continua vigilanzia considerare e vedere se la città incorrisse in alcuno mancamento, o grave o non, a esso subito ripar debba con quelli argomenti che necessario sieno."

64 Ibid., T1, Città, 20. "|L 5...|Avendo la città ragion, misura e forma del corpo umano, ora delle circunferenzie e partizioni loro precisamente descriverò. In prima è da sapere steso in terra el corpo umano, posto un filo a l'imbellico, alle stremità d'esso tirata circulare forma sirà. Similmente quadrata ed angolata disegnazione sirà. Adunque è da considerare, come el corpo ha tutte le partizioni e membri con perfetta misura e conferenzie., el medesimo in nella città e altri difizi osservar si debba. E quando in esse città rocca da far non fusse, il luogo d'essa cattedral chiesa s'attribuischi, co' la sua antiposta piazza dove el palazzo signorile abbi corrispondenzia. E dall' opposita parte e ritondità dell'ombellico la principal piazza. Le palme e piei ad altri tempi e piazza da construir sono. E cosìcome gli occhi, urecchi, naso e bocca, le vene intestina e l'altre interiora

shape of the human body, which I will describe in its circumference and divisions precisely." He describes that one must know "how to draw/inscribe the human body into the earth by placing a wire at the navel, making a circular contour around the body. Similarly draw the square and angled designation around it."

Francesco reasons that similar to the body, which has all its "parts and members with perfect measures and contours" so the city and other buildings are to be built in likeness to the body. Francesco explains that if there are no fortresses to be built in the city, then the cathedral should take its place. The piazza and the seigniorial palace should be facing the cathedral, at a symmetrical distance from the navel. He describes that the "palms and feet" are to house other churches and *piazze*. And he further points out that "just like the eyes, ears, nose and mouth, the internal veins, the other internal organs and limbs that inside and within the body are organized such that they tend to its necessities and needs, the same should be observed in cities." Here we see that analogy lies in the general functioning of the body, as the essence and being of the body, as well as in the manner that its functions are related to that of the city.

If one only had the text to read, it would be hard to imagine anything particularly unique, as such arguments have been used previously and such likenesses made. Overall the explanation does not give any evidence of eccentricity or peculiarity. Francesco seems to be preoccupied with allocating appropriate places to the composing elements of the city. A complimentary paragraph can be referred to at the beginning chapter of T1, in which Francesco recounts the story of Dinocrates.[65] Francesco explains that the city, fortress or castle "should be shaped like the human body." Therefore the head, "will be the place for the fortress; the arms, which are attached to the body, will be the surrounding walls, as will be the legs. All the rest of the body is the territory of the city." Francesco explains that the same is depicted in the drawing that Dinocrates showed to Alexander. He recounts the story that upon hearing that "Alexander desired to make a new city, he formed the city in the shape of man, whom in the left hand had a vessel, into which all the veins of the body run; and in his right hand, he held the walls of the new city". Francesco concludes that one has to

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e membra che dentro e interno al corpo organizzati a la necessità e bisogno d'esso, così in nelle città osservar si debba, siccome partitamente alcune forme mostraremo."

65 Ibid., T1, Fortezze., 4. "|...T3|Parmi di formare la città, rocca e castelo a guisa del crop umano, e che el capo colle appricate [applicate] membra abii conferente [gisuta, proporzionata] corrispondenzia, e che el capo la rocca sia, le braccia le sue aggiunte e ricinte mura, le quail circulando partitamente leghi el resto di tutto el corpo, amprissima [amplissima]città. Siccome Dinocrate manifestamente ad Alessandro in figura mostrò, el quale sentendo Alessandro desideroso nuova città edificare, lui allora Aton monte a guisa d'omo formò, el quale nella mano sinistra teneva una tazza che tutte le vene del corpo in essa corrivano, e nella mano destra le circulate mura della nuova città. E pertanto è da considerare che, come el corpo ha tutti I membri l'uno all'altro conferenti e le partizioni [subdivisioni, parti] con perfetta misura, cosi in nelle composizioni de'tempi, città, rocche e castella osservare si debba."

"consider that as the body has its surrounding members and all its parts, and subdivisions with perfect measure, similarly in the compositions of temples, cities, fortresses, and castles the same principles should be observed." The drawing is presented in Fig. 9, (T2, f. 27v TAV 210; entitled: Reconfiguration of Mount Athos according to Dinocrates). We have previously considered Kemp's interpretation of this drawing. In this drawing Mount Athos, sculpted in the shape of a human body, envelops and protects the city by holding it in one hand. On the other, there is a vessel to which all the waters from the body's veins run. So here is a reversal in the relationship between the body and architecture, since the body's size and importance is magnified in comparison to the body of the city.

The drawing that would capture the essence of these ideas is the first drawing that is located at the beginning of T1, Figure 5. (T1, f. 3 TAV. 1; entitled: Various figures and construction. /figure of the body where the circumference and the distribution of the city is located). The drawing illustrates a standing man, whose feet are open in an X position and his hands stretched to hold what is placed on top of his head. The man's figure is superimposed on the plan of a fortress or a small city, uncanny since the fortress is partly represented in the plan — sometimes elaborately detailed and sometimes schematic — and a three-dimensional view in the case of the *borgo*.[66] Starting from the ground up, the young man's feet are each surrounded by a horizontal figure or plan of two *torrioni*. (great towers) The lines of a wall connect these lower towers to the arms in which two other *torrioni* are inserted, as if the latter were tubes connected to the stretched line of the walls that link them to the two circular structures at the bottom. The man's navel is the centre for a circular *piazza*, to which the *tempio*, the church, opens up. The church is located in the chest, on the symmetrical axis of the body going through the navel. The arms are stretched so that they protect the *borgo* placed on the man's head. Based on what appears to the eye, the plan of the *borgo* seems to consist of a hexagon sitting on top of the circle of the head.

As the feet and the arms are the balancing anchors of the body, they offer a suitable strategic location point for the *torrioni*. The *piazza* is related to the chest, the heart to the *tempio* and the other side connected to the phallus, becoming the scene of the daily activities of man from the most divine to the most earthly. The young man's body and the fortress are intertwined and articulated so that they make a consistent loop. The lines of the plan, which represent the wall of the fortress, seem to be natural gear for some performative dress/ costume/ apparatus. The *rivellino*[67], located at equal

66 In his article on military architecture Adams hints at the dual position that the body occupies in space. See footnote 61.

67 The definition of rivellino is: opera di fortificazione collocata all'esterno della piazzaforte di un castello per difenderlo dagli attacchi nemici e proteggere le sortite degli assediati which translates to work of fortification

distance between the two feet, is on the axis of symmetry that passes through the umbilicus, literally and figuratively amplifying its purpose by lining up with the phallus as a way to get rid of the body's waste. This relates to Francesco's background in the *bottini* (Siena's waterworks) and his attention to the flow of water. We can see that here the body acts like a sophisticated machine, not only allowing for certain locations to be designated, but engaging in the act of defense of the city thanks to the incorporation of hands and feet into the wall and the head's support of the *borgo*, also held by the hands. Here we see that Francesco treats the body not unlike the military apparatus he designed with a function in mind.

In an essay on the relationship of body and building[68] which criticizes the contemporary representational use of human figures in architecture, Marco Frascari discusses "body image," or the schema of "imaginal body." Frascari points to the fact that the imaginal body is not a literal image of one's body, fashioned merely as the product of sensation, representation, or perception, but an amalgam of these phenomena. Thus the imaginal body is not a literal picture of the body, but an image whose power is partly rooted in social and cultural forces present at the time. According to Frascari, such an amalgam has a potential that can be explored and used in architectural design. In a passing comment, Frascari qualifies Francesco's drawings as "Italian mimes"[69] and suggests that they assume extrinsic and intrinsic representations.

Frascari's designation of mimes is pertinent, since Francesco's characters engage us silently with their bodily motions. Due in great part to his painterly background,[70] the expression of his human bodies transcend mere images by becoming characters, alive and each different from the other. They engage the audience in mimicry, and encourage it to partake in the spectacle of architecture. Although the wide range of drawings undertake various roles, they all share the architect/painter's constant touch, one that is enriched in part by a painterly background and sculptural sense, and in part by the illuminator's cunning intelligence in the use of symbols, analogy, and metaphor. However, the drawings are intended to be solely architectural. They play their part

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located outside the stronghold of a castle to defend it from enemy attacks and protect the sorties of the besieged, online source: http://www.wordreference.com/iten/rivelino in De Mauro, il dizionario della lingua Italiana. 01/04/2010.

68 Marco Frascari, "A tradition of Architectural Figures: A search for Vita Beata," in Body and Building, 258-267.

69 Ibid., 266.

70 Being aware of the fact that many of the drawings are not autograph, as they are from different copies, made by scribes, nonetheless, the autograph drawings, and the codices made and copied from Francesco's own drawings have a close proximity to the autograph drawings, relatively speaking, thus in the current dissertation, there has been a deliberate recognition of what is attributable to Francesco, even though the drawings might not be specifically from his hand.

through gestures, facial expressions, and their stories coming to life; but their ultimate purpose is to narrate, embody, and reenact architecture and thus revive the stories of the *antichi*, making the case for the architecture of the *moderni* but more than anything else transmitting their author's *fantasie* and appealing to the reader's *imaginazione*.

The importance of insisting on character instead of figure, and on mime and spectacle instead of presence, in the *Trattati* may be more tangible if we look at the degree of tightness and the space between body and architecture. As an example of how the body is enveloped by the architecture, the drawings of columns Figure 6 (T1, f. 14v TAV. 24; entitled "Column, capital, pilaster) show the proportion and origins of three columns, followed by figural elements. The one on the left, "Column of nine divisions according to human body," can be compared with the one on the right, "*Stolata* column with the subtlety of a lady." We can see that in both cases the relationship between the body and the column is very tight, and there is barely enough room for the entire body, so that the shoulders and hands are even reduced. The only diversion from this pattern in both cases is the position of the feet, where one foot is in front (for the *stolata* column) or slightly forward (for the nine-part column.)

In the case of the church drawings, if we look at Figure 8 (T2, f. 42v TAV.236; entitled: Anthropomorphic proportion of a temple with a longitudinal plan, dividing the height of human body to nine and seven parts), we see ample space between the human body and the outline of the church. This might be in part because the plan drawings of the *Magliabecchianus* codex are mainly one line and do not show thicknesses; thus we can see clearly the space that is left between the body and the architectural enclosure. However, we can also observe that the mapping of the specific points of the body is done with much diligence. The hands are behind both figures, and they are slightly twisting their hips, allowing for an opening of the right leg, defining yet one other measure for the division of the plan.

In Figure 17, (T1, f. 21v TAV38; entitled: Types of vaults and façades of temples), we can observe yet another example of the relationship between the body and architecture. Here, the stretched-open hands literally define the lines of the lower pediment's slope, and the head both wears and carries the load of the upper pediment. The critical weight of the building distributed to the body is in slight opposition to the relatively relaxed pose of the lower body. If this figure is to be compared to Figure 7, (T2, f. 38v TAV. 228; entitled: Scheme of the proportion of the façade of a church with a longitudinal plan), we can observe that the hands are no longer engaged in holding the roof. Rather they are casually held at the back, and the relationship between the head and the frontispiece seems

less precarious, allowing the figure to play the role of a guide instead of literally holding the building together.

In Figure 18, (T 1, f. 12 TAV. 19; entitled: Proportions of temple and the principal chapel), on the left side of the page, we see three heads, each articulating a different proportion for the main chapel. Among the three faces that define the proportions, we can see a slight inclination of the head in the figure on the left as if, slightly tired of the pose; he has decided to tilt his head a just slightly. Another look at the heads reveals that although in the two other cases the straightness of the face is needed (since there are more divisions that take account of different elements such as the eyes, nose, chin, and shoulders), our first figure has relatively more freedom since its divisions only correspond to the eyes and the chin. This allows for more flexibility that the figure on the right, for example. The one on the right has the same two division lines, together with shoulders, so that a straight profile is much more important.

In such examples, we witness the sharpness, agility, and the *solertia* (cunning intelligence) that Francesco advocated in his writings. This stakes a claim for the reversal of the literal, and shows that beyond the literal surface of such superimpositions and linkings, varieties and subtle nuances are depicted. In the variety that exists between the tight relation between the columns and the body as opposed to the more relaxed pose of the church drawing in which the human stands normally; the one in the fortification drawing in which the body has the form of an X, seemingly more fixed in a defensive pose; and the final reversal, the figure of Dinocrates; we are shown different renditions of the body, characters, and poses, synchronized with the purpose they each serve.

In order to further discuss the variety, flexibility and malleability of Francesco's drawings, I would like to make a connection between Francesco's theory of human analogy in the *Trattati* and Pico della Mirandola's (1463-1494) *Oratio de dignitate Ominis*.[71] Both works place man front and centre in their discourse, sharing the human being as their common ground. However, the comparison is less about the content as it is with the style in which each author treats the subject, by magnifying man's characteristics and potentials. The point is not to trace a direct lineage between the two subject matters, but rather to use one as a way of understanding the other, and thus present a different viewpoint for the perception of Francesco's construction of his text-and-drawing amalgams.

71 Pico della Mirandola, Oratio de Hominis Dignitate Oration on the Dignity of Man, English Translation by Elizabeth Livemore Forbes, (Lexington, KY.: Anvil Press, 1953). It is suggested by Maltese that Francesco was familiar with Pico's work on Astrology; however the extent to which he might have known other works by Pico is not known. This parallel is therefore one more conjecture in the realm of meta-languages that Tafuri talks about.

Francesco's use of man's body to make relevant his architectural thoughts recalls Pico's definition of human nature in *Oratio de Hominis Dignitate*.

In Pico's words, God has created human beings in his own image, yet has given them free will so that they can take form and act according to their choices. Addressing Adam, Pico writes on behalf of God: "We have given you, O Adam, no visage proper to yourself, nor endowment properly your own, in order that whatever place, whatever form, whatever gifts you may, with premeditation, select, these same you may have and possess through your own judgment and decision."[72] As we can observe, judgment and selection come into play in defining man's gifts, and abilities – not dissimilar to Francesco's *judizio* and *discrezione*. Pico continues: "The nature of all other creatures is defined and restricted within laws which we have laid down; you, by contrast, impeded by no such restrictions, may, by your own free will, to whose custody We have assigned you, trace for yourself the lineaments of your own nature." Here literally man's path of life is compared to lineaments, which man can himself draw based on his free will. The discourse continues: "I have placed you at the very center of the world, so that from that vantage point you may with greater ease glance round about you on all that the world contains. We have made you a creature neither of heaven nor of earth, neither mortal nor immortal, in order that you may, as the free and proud shaper of your own being, fashion yourself in the form you may prefer."[73]

If I may be allowed to continue the comparison, Pico's allusion to free will, reminiscent of Francesco's notions of *ingegno*, *invention* and *imaginazione*, define the capacity of man as boundless. This infinite ability of man to create/choose based on judgment and discretion allows one to trace one's path of line or *disegno*. The purpose of bringing Pico della Mirandola into the discussion is to show how Francesco's use of drawings takes different forms and substance, liberating the architect while at the same time engaging him in the path devised for the project. In the following passages two major themes of Francesco's work, the theory of human analogy and that of machines, will show how malleable drawing becomes in his hands. As a sculptor, he moulds and shapes drawings with his mind's hands and his hand's eyes, bringing them to life and making them take the form of his ideas. Thus drawings do not have the fixed, predestined purpose of simply illustrating architectural ideas; they embody, narrate, and restore *disegno* to life according to the architect's *giudizio* and *inventio*. Although one could imagine that every drawing began with a specific idea in mind, the adjustments that Francesco (or an architect) makes, and their outcome, reshapes the first idea. The drawings thus

72 Pico della Mirandola, Oratio de Hominis Dignitate This particular translation, found on the following link: http://www.cscs.umich.edu/~crshalizi/Mirandola/ consulted on 01/04/2010is favoured over other translations of Pico's work. The other edition consulted is cited in footnote 69.
73 Ibid.

become autonomous entities in the *Trattati*, capable of defining themselves. As mentioned previously, both Alberti and Filarete recognized discrepancies between subject and depiction. We can cite specifically Alberti's[74] astute awareness of the discrepancies that arise in the sequence beginning with the shaping of the idea in the mind and ending in the making of the three-dimensional model. However, the transformation that occurs in Francesco's drawings has a different nature. Drawings become analogical, metaphoric or symbolic. They activate the viewer's memory and imagination, and claim a life of their own and an extended existence beyond that of the *Trattati*.

VIEWER'S EYE'S TRAVEL IN HEIGHT, CONVERGING VS. PARALLEL PROJECTIONS

One of the most interesting and problematic issues regarding the early phase of perspectival drawings is the dilemma that the artists and architects confronted in coming to terms with a suitable rendition of different building elements. Frommel[75] suggests continuity in the development of perspective, which began to be used in the thirteenth century and lasted until the end of the fifteenth. Perspective gradually became a more applicable knowledge through the writings of Alberti and Piero della Francesca, among others, and the experiments of artists and architects. It is debatable what the nature of this continuity might be. One might detect a gradual maturing process from the thirteenth century to the beginning of the sixteenth century. However, considering the independence of the Italian city-republics and the specific circumstances and chain of events in every artist's and architect's life, it might also be possible to read the events and the contribution of each artist or architect as relatively episodic, recognizing the autonomy and independent endeavours of each artist and architect. The latter approach, I believe is more suitable in dealing with discontinuous and localized factors related to each artist and artistic circle. Although agreeing with the outcome of what Frommel calls a gradual embodiment and mastership of perspective by the end of the fifteenth century, the present work favours the episodic over the gradual.

Such a discussion introduces one of the most enigmatic issues with regards to Francesco's drawings. As noted earlier, there is an ongoing effort, if not struggle, in his compilation of drawings to show elements so that they convey information the author has in mind. Instead of following one general pattern for three-dimensional drawings, either converging or parallel projection, he varies the method of drawing depending on the subject matter. There is a clear distinction between architectural drawings, which are presented through orthographic projections, and converging one-point perspectives. However, fortresses are mainly presented in what could be characterized as

74 Alberti, Art of Building, Rykwert Edition, 317.
75 Frommel, Reflections, 101-122.

cavalier perspectives. In the case of his machines, Francesco employs isometric or similar parallel projections, sometimes slightly converging to emphasize depth.

In characterizing them as rigorous and disciplined, the intention is not to suggest that all of the architectural drawings in *Trattati* are flawless converging perspectives without any struggle, dilemma, or apparent problem; rather one can say that there is a conscious attempt to keep that material as consistent as possible. In T1 there exist elaborate plans drawn for houses and palaces, and the same plans are redrawn in T2 without the thickness of the walls. However, they are plans in the sense that they represent a horizontal footprint of the building and are recognizable as plans. To make this point clear, Figure 19 (T1, f. 17v TAV. 30; entitled: Plans of houses) can be compared to the information presented in Figure 20, (T2, f. 21 TAV. 201; entitled: Plans of private houses of various shapes.) Although the level of elaboration and detail goes much further in Figure 19 versus Figure 20, the essential information is retraceable and the forms recognizable as plans. As previously mentioned, the drawings of Figure 20 can be understood as either diagrams, or more specifically relational drawings. Figure 21 (T1, f. 20v TAV. 36; entitled: Façades of houses) demonstrates a series of elevations, which are once again fairly autonomous in their appearance and presentation as frontal faces of buildings.

In certain cases, it is also possible to see a coordinated set of plans and internal perspectival elevations as is the case in Figure 22 (T2, f. 34v TAV. 222; entitled: Corinthian capital and its proportions.) Looking at the base of the column one is able to understand the primary derivation of the measures, the amount of enthasis, and the elevation of the capital. In both T1 and T2 there are many instances of three-dimensional views of architectural elements, parts, or entire buildings. In Figure 23 (T1, f.14 TAV. 23; entitled: Temples, theaters, and resonating vases) we see an attempted foreshortened elevation on the lower left side, together with a rather curious bird's eye view of a round temple, in the centre next to a plan of the same temple. On the right side we see two renditions of the external view of theatres as well as a detail explaining the functioning of resonating vases.

In the case of architectural drawings, Francesco is fairly rigourous in following the known pattern of plan, interior elevation, and in many cases converging or one-point perspective. The folio of antiquity drawings appended to *Saluzzianus*, such as the interpretive drawings like Figures 1, 2, 3 and 4, are the best examples of such rigour and discipline. These examples show well that Francesco's converging projections are not always consistent from the point of view of *perspectiva artificialis*; however, there is a relative consistency in terms of what might have been the common

rules and practices in his time and place, as the point of the one point perspectives was to give a view of the building; technical correctness was not even at stake yet.

Let us look at a couple of examples depicting fortifications. In his article on the history of axonometry, Massimo Scolari[76] relates the propagation of cavalier perspective or *perspectiva soldatesca* to the phenomenon of defense in military architecture. Of interest in Francesco's case is the very high point of view, and the fact that in many of his military drawings there are several converging points. The reason may be that the he wants to make sure that all that is necessary to be seen and understood through drawing appears to the eye. In Figure 24, (T2, f. 83v TAV. 304; entitled: Fortress with entrance across spiral staircase in form of a funnel wrapping around a great tower and visible from the *mastio*), it can be seen that the spiral staircase is shown in a plane that seems almost parallel to the picture plane, but the rest of drawing follows a much more reasonable isometric view.

Figure 25, (T2, f. 87 TAV. 311; entitled: Harbour inside the city with a polygonal front-harbour - *antiporto,* two entrances guarded by two big towers) demonstrates a front basin, the harbour, and the city in the background. Here we see that the drawing, partly isometric and partly one-point perspective, reveals as much as possible by altering and multiplying the converging points. Thus the closest element to us, the front basin, is severely tilted in order to allow a view through the harbour and the city in distance. The foreground shows a view closer to a parallel projection, while the background faithfully converges into a point; and the harbour, sandwiched between the two, is partly isometric and partly perspectival.

By looking at Figure 26 (T1, f. 38 TAV. 71; entitled: Mill by counterweight, mills moved by animals and man, windmill) we can detect many inconsistencies in the way the views are drawn. While the lines for each machine are supposed to primarily converge to one point, it appears that almost none of the drawings has one single converging point. Of significance is the compartmentalization of different parts into what appears as a frame for many of the machines. In this particular page, only the windmill, because of its particular make and function, lacks such a surrounding frame. Once again the author seems to be much more preoccupied with showing all the important parts that compose the machines. In case of Figure 27 (T2, f. 95 TAV. 325; entitled: Mill with falling water) we can see that there is more of an isometric view than a perspective one. Here,

76 Massimo Scolari, "Elements for a History of Axonometry," Architectural Design Profile 59: The School of Venice (1985), 73-78. Scolari's thoughts could be further followed in Massimo Scolari, Il Disegno Obliquo: una Storia dell' Antiprospettiva (Venice: Marsilio, 2005).

the main divisions of the box are not foreshortened, and the drawing appears less deformed and more credible than in some other depictions.

Thus the machines and fortifications are depicted with a less systematic approach, not so much out of neglect, but rather as the attempt is to give the viewer many different views of the machine or military element. In this case a potential understanding of the objects and their connections and positioning are favoured over converging one point perspectives. Throughout the *Trattati*, the reader witnesses Francesco's constant attention, and his effort to find the correct medium to represent each element in relation to its presupposed effect and final purpose presents the same zeal that he also showed in polishing his text and making it philosophical. To explain the extensive use of the isometric drawings made by Leonardo, Scolari asserts: "Da Vinci obviously did not use parallel projection because he was uncertain of other techniques or because he wanted a method that was 'quick', but seems to have chosen it because it was better suited to representing the *actual space of the object* rather than the object in space."[77] In the same manner, Francesco's curious renditions of converging and isometric projections should be understood as evidence of the author's determination to show what he deemed to be essential, and not to miss by what could be seen by the eye.

One recurring curiosity in the machine drawings is the mystifying appearance of boxes[78] that often contain the machines, and the occasional disproportion between men, animals, and the parts of the machine. These oddities can be explained as visual devices invented by the architect to help us understand the major parts and movements of the machine, and to better imagine its function and use. The machines are "contemplative", as they are vehicles that mediate the miraculous cause-effect relationships that must be a divine trace. The boxes make us focus on the machine and concentrate our attention on the interconnections of cogs and wheels. It is also possible that sometimes the compartmentalization within the boxes might clarify how to separate the critical parts so each part's function could be understood. Although some of the machines are supposed to have been very large and rather slow-moving apparatuses, still the somewhat disproportionate and categorical placement of dividers, or interior walls within the space of the boxes, conforms to Francesco's desire to direct one's gaze towards the area of focus.

77 Ibid., 73.

78 My suggestion departs from Guess's idea in her dissertation. In looking at that specific phenomenon, Guess suggests that the reason for the appearance of the boxes might imply some notion of visual containments. See Guess, Machines, 19.

One other formal characteristic of the drawings, the one least associated with architecture and yet one that influences the drawings, is Francesco's hand (style). Not directly linked to his being an architect or author, this manner of drawing stems from his complex and diverse set of talents as a painter and sculptor, his artistic upbringing, and the experiences of what he fondly calls *antegrafica*. While this is not something that can be exactly proven, but a careful look at his authentic drawings versus the various copies made later, essentially reproductions of his drawings, is telling.[79] Francesco avoids expanding on the notion of *arte antegrafice*, of what exactly constitutes and makes it, and how expert one should become in it in order to make *disegni* in architecture. Yet he stresses its importance as the cornerstone of the architect's education.

To make the case for the significance of the formal appearance of Francesco's drawing, of what could be deemed beautiful or marvelous, we can call another author to testify on the importance of the way drawn material is ultimately judged, without compromising the primacy of content. Similarly, it is not possible to precisely measure the success or to criticize the drawings in *Trattati* without being affected by their formal beauty, by what appears to and pleases the eye. The criteria of judgment for Francesco, being dependent on both the eye and the mind's eye, are equally satisfied as the drawings capture one's attention as the tenderness and compassion of Francesco the painter is transferred to the faces and bodies of his characters of human analogy – rendering them as humane as they are pleasing to the eye. On the other hand, his drawings engage the mind's eyes as they invoke reflection and participation on behalf of the reader. Francesco's machines on paper are cast with the same precision and care, as Francesco the sculptor cast the angels for the *Duomo* of Siena. In giving form to drawings, he has molded a unique body of work and given souls to the cast of characters in *Trattati*. Ultimately what makes the drawings so unique is their beauty, as much due to *antegrafice* as to the *ingegno* of the architect.

79 In the course of my study, the themes of authenticity and the nature of autograph versus copies of Francesco's work have come up many times. My opinion is that the copies that were made by the scribes and copyists during Francesco's life and executed under his supervision bear enough proximity to be considered authentic as far as it concerns the present discussion. Therefore the identification of Francesco's 'style' is a deliberate misnomer that includes the Trattati drawings executed by others. In relation to this comment, it would be relevant to refer to Carpo's opinion on that matter in his book on printing. Carpo suggests that the multiple hands at work, in copying and drawing Francesco's manuscripts, would more or less follow Francesco's own path of using models, and further expanding them through drawings. He observes that addition of the copyists possible interventions would be in line with the notion of "creative imitation" during the Renaissance. Carpo speculates that Francesco's had not conceived the *Trattati* as a book that would be printed Cf. Carpo, Architecture in the Age of Printing, 127.

In chapter one, Francesco's emphasis on the notion of *antegrafice*, and the possible explanation for his use of the temm based on Maltese's suggestion was referred to.[80] Maltese's point about Francesco's use of *arte antigrafica* as evidence of an overarching desire to raise the status of the arts of design to liberal arts is well taken. Maltese explains that Francesco's term *antigrafica* signifies arts of design, and is derived from a Plinian codex in which by mistake the sentence *"ut pueri ingenui omnia ante graphicen, hoc est picturam in buxo, docerentur…"* has been inscribed "omnes (omnia) antegraphicen…"[81] Maltese explains that the error must have been a rather common one, since according to Promis, Raffaele Volterrano in the same year, and later Cesare Cesariano in 1521, also used the same term. According to Maltese, Francesco distorts Pliny's notion of *graphice*. Pliny had only used the term to specifically describe an aristocratic branch of painting, but Francesco supplants that usage in service of a more overarching argument in favour of the liberal arts, in line with a general tendency among Renaissance Artists.

I would like to suggest, in closing, my own variation on this understanding. For Francesco, as a painter, sculptor, relief-maker, illuminator and ultimately an architect, it would be counterintuitive to prevent one discipline from flowing into the other. Francesco opens his T2 with an invitation to learn the *arte antigrafica*,[82] referring to its importance in antiquity and its significant position, he concludes T2 with an almost identical emphasis, this time urging the readers to learn a*ntigrafice*.[83] Consistent with this, Francesco identifies both painting and architecture as part of *antigrafica*,[84] and further confirms that "*arte del disegno a e del'architettura*" are part of "*antigraficie*".[85] He does so not in mere words both also through his practice: combining both painterly fundamentals and architectural elements in his own drawings. Francesco's conviction that the two disciplines belong to the same sphere, is born from the fact that his drawings are located at an intersection of painting and architectural drawing practice.

CLOSING

In his architectural treatise, Alberti establishes the locus of *lineamenti* in the intellect and speculates that beauty, as well as the ability to distinguish it, stems from abstract ideas conceived in the mind. In his own book, Filarete uses drawing as a complementary annex to his architectural descriptions, as he

80 See chapter two, 65-66, also footnote 84.
81 Di Giorgio, Trattati, (4) by Maltese.
82 Di Giorgio, Trattati, T2, Preambolo, 293, 293(2).
83 Ibid., Conclusione, 506.
84 Ibid., Preambolo, 294.
85 Ibid., 295.

recounts the tale of building an imaginary city. In the *Trattati*, Francesco embraces the potential of drawing as a means to arrive at *disegno* (the idea of a project, through drawing) and delves deeper than his two counterparts into the possibilities that drawing offers as medium. The variety and versatility of drawings in *Trattati*, powerful in their undertakings, less homogeneous and less easily categorizable than what followed in later centuries, reveal the critical role that drawing can play in manifesting architectural thought.

In light of what is discussed in the present chapter, it becomes apparent that there is correspondence between from and content that strengthens the drawings of the *Trattati*. If we understand the drawings as works that are to evoke the essence of the text, they become significant in bringing to life the essential elements of the subject matter, and simultaneously gain strength on their own.[86] I have defined three different categories for Francesco's drawings in this chapter: interpretive, theoretical and inventive. Although these categories are delineated with three different terms, they all carry a common trait: description or interpretation of the ideas of the text, and retelling it in a new format. This process of 'interpretation and retelling' has found a proper vehicle in Francesco's drawings, as the architect uses different forms of expression, depending on the intended destiny of each type of drawing.

Also, while obviously evident, it is important to articulate that what makes the drawings unique is that they are products of the hand and the mind of the artist. The juxtaposition of figures and decorative elements, architectural compositions, warfare, machines and fortresses creates a certain atmosphere which is at times descriptive, at other times prescriptive, and occasionally enigmatic. While re-readings of Francesco's drawings can magnify certain concepts, the drawings have an otherness to them that distances them from being extensions or descriptions of the text in another medium. Going back to Aristotle's qualification of the metaphor in the beginning of this chapter, the drawings of the *Trattati* emerge as having the power of transferring concepts and hinting at relationships.

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86 In thinking about the particular characteristics of Francesco's drawings, reading tangentially about the notion of ekphrasis in painting during the Renaissance has helped me articulate my thoughts. An expanded understanding of ekphrasis suggests that its boundaries extend beyond serving as a commentary on a work of art, by becoming a medium of interpretation which influences on the work. Michael Baxandall tends to the notion of ekphrasis by looking at the medieval literature, through the work of Guarino da Verona, Tito Vespasiano, and Alberti. Cf. Baxandall, Giotto, 85-7, 90-6, 135. Also David Rosand discusses the notion of ekphrasis by looking at Alberti's On Painting and Ariosto's Orlando Furioso. Cf. David Rosand, "Ekphrasis and the Generation of images," Arion, Third series, Vol. 1, No. 1 (winter 1990): 61-55, Trustees of Boston University, (http://www.jstor.org/stable/20163446). 01/04/2010.

I would like to end with a drawing by Francesco's hand, which manifests the enigmatic character of his work. Figure 28 (entitled: two feminine figures) depicts two female figures next to each other. This drawing, which was done sometime between 1475 and 1480, is kept at the Uffizi and was attributed to Andrea Mantegna and Sandro Boticelli before being identified as being Francesco's by Andrea De Marchi.[87] The drawing belongs to Francesco's series of folio drawings that we have previously discussed as those showing his mastership to potential clients. The drawing portrays two figures, one with her back to the viewer, while the other turns her face and angles her body such that she is partly forward and partly drawn back from the picture plane. The two figures are covered heavily with drapery, so that some parts of their body are not visible. As each one's gaze is directed towards the side, they seem to be drawing away from each other. The only point of contact – in which the two figures do not physically touch but their garments almost do – a point that focuses the attention and draws the eyes to the two figures is located in the center, slightly to the right and upward. That moment of junction brings one's eye in and focuses one's attention first to the whole image and then to the details of each figure, their poses, and their dress ornaments. Beyond a certain level of mastership, the drawing has an enigmatic aura that makes it somewhat of a mystery. The magnetic effect of the aforementioned point or '*vincolo*'[88] is what differentiates between the two figures and unites them at once. It allows one's eyes to circulate at will and take in the details, and yet it always focuses the viewer's attention to the center. As if the drawing would be a specific viewing machine, it first attracts and then disperses the gaze, resulting in a perpetual focusing in and redirecting of the eye.

Francesco's drawings in the *Trattati* operate similar to that *vincolo*. They bring in elements from the past and encapsulate them in a condensed present. They tell or retell a tale, and at the same time open up the very tale they are narrating to re-interpretation. By operating as devices that are placed among the pages of the *Trattati*, they are at work to engage and focus the reader's attention, only to redirect it and initiate further inquiry. The infinite cycle is at work constantly, to engage and enthrall the reader's gaze and imagination.

87 De Marchi, Catalogue entry No. 59: Due Figure Femminili, 1475-1480 circa, in Bellosi, Rinascimento, 310. The drawing is at the Gabinetto Disegni e Stampe, inv. 36 E, pen on parchment, attached (potentially to a piece of paper)

88 *Vincolo* literally means a tie or a bond. Pérez-Gómez and Pelletier briefly refer to *vincoli* in relation to a sympathetic universe. Pérez-Gómez and Pelletier, Perspective Hinge, 9.

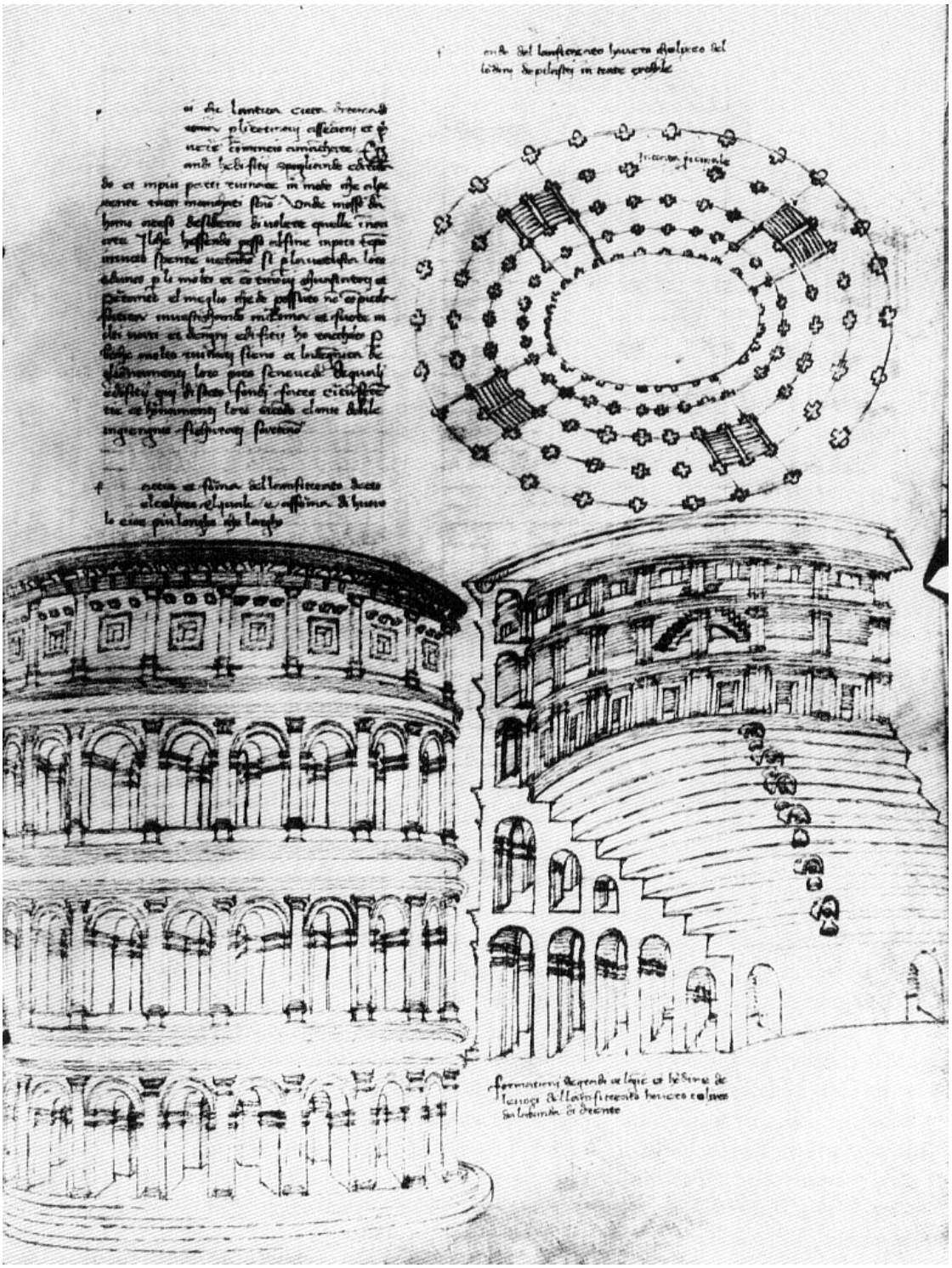

FIGURE 1. T1, F. 71 TAV. 129; ENTITLED: PLAN, *ALZATO*[1] AND SECTION OF THE COLISEUM.

[1] *Alzato* is equal to *prospetto*, meaning either a façade, or a view of a building, literally means raised up. In this case the general view (perspective) is intended.

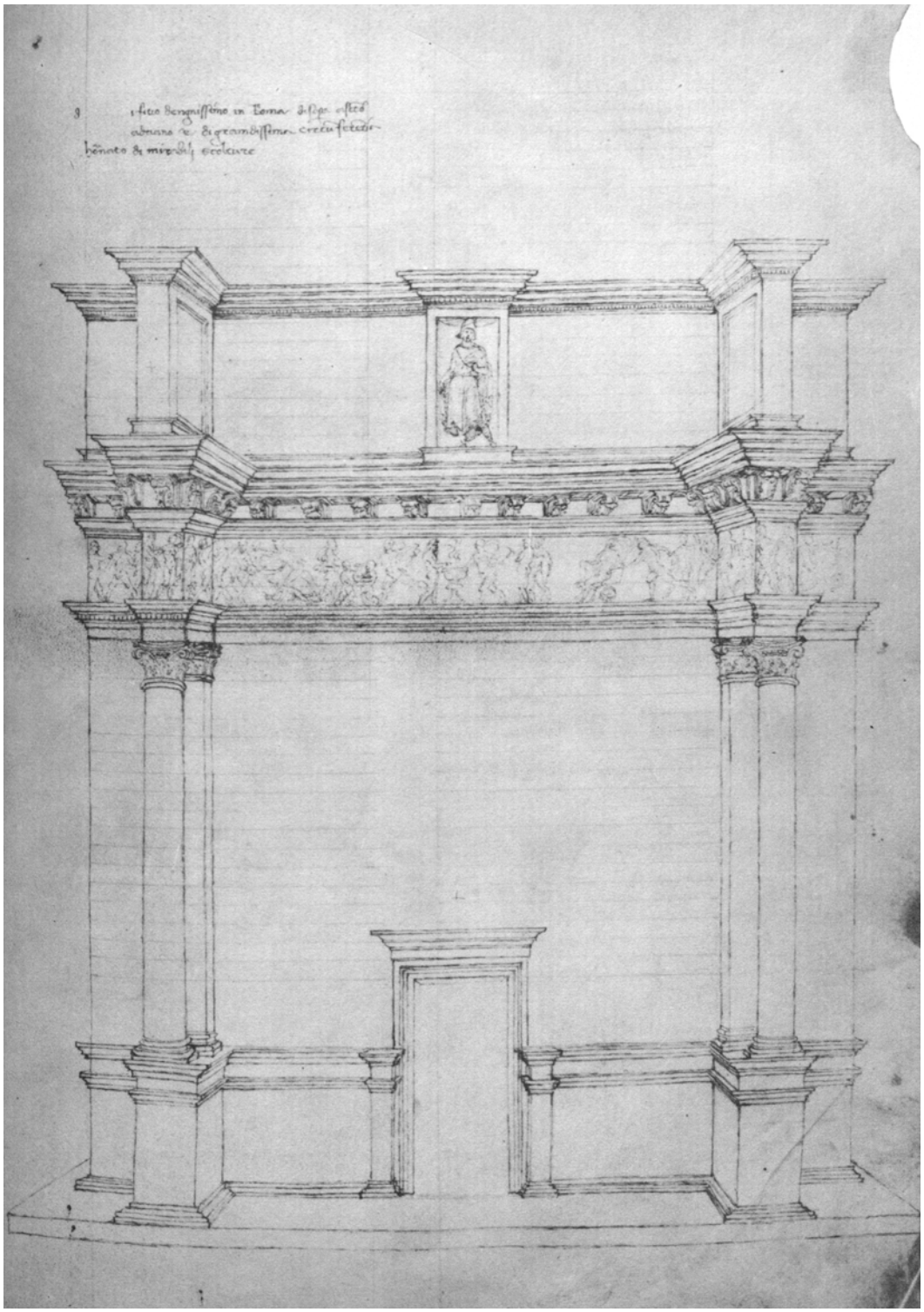

FIGURE 2. T1, F. 78 TAV. 143; ENTITLED: FAÇADE OF PART OF THE RECINTO – A LIMITED PART OF A SACRED SPACE – OF THE TEMPLE OF MINERVA).

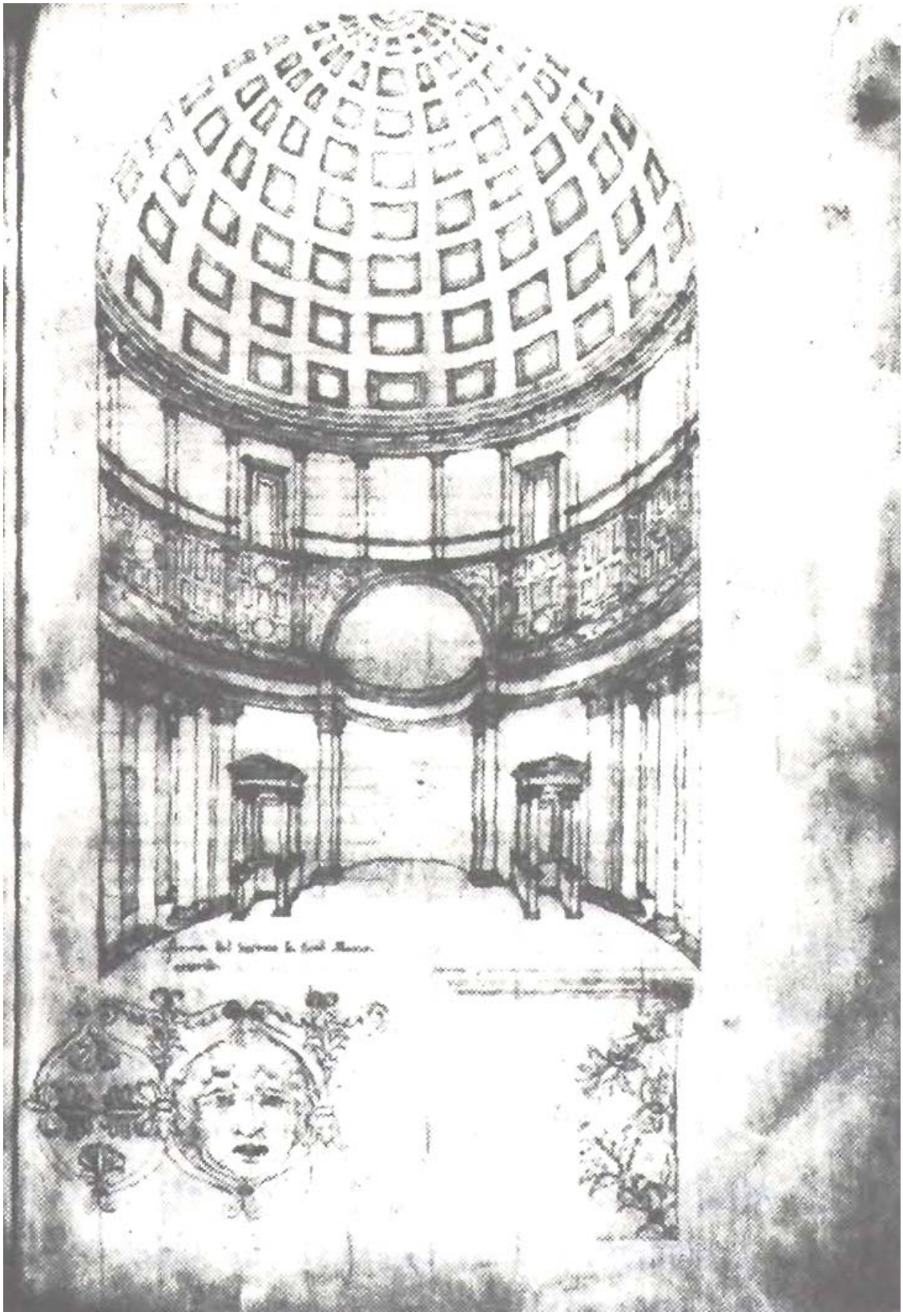

FIGURE 3. T1, F. 80 TAV. 147; ENTITLED: THE INTERIOR OF THE PANTHEON AND DETAILS OF THE DECORATION.

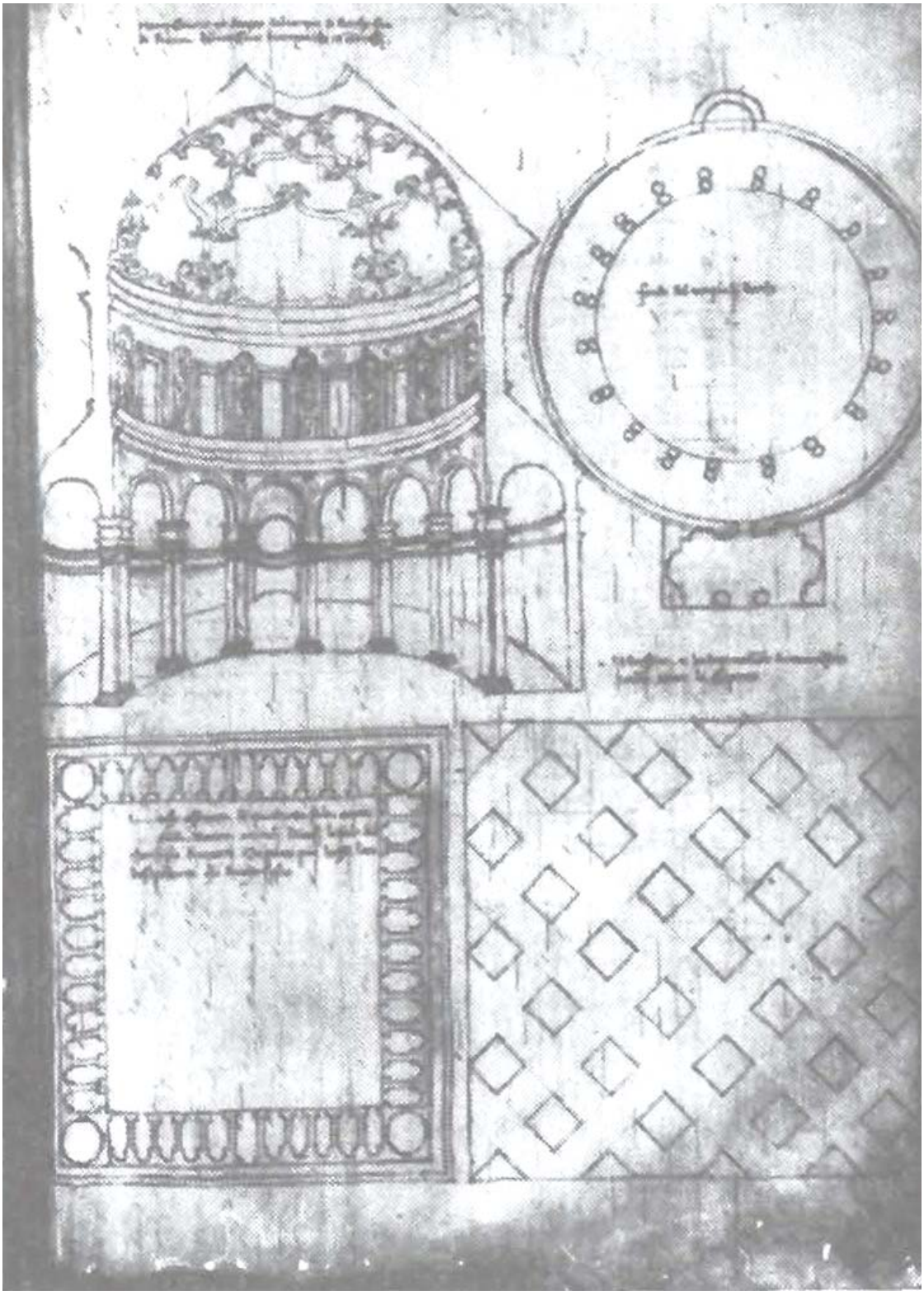

FIGURE 4. T1, F. 88 TAV. 163; ENTITLED: INTERIOR AND PLAN OF *SANTA COSTANZA*, PLAN OF A BUILDING CLOSE TO *SANTA MARIA* IN *ARACOELI* AND PLAN OF THE CISTERN «*ALLE CAPOCCE*» .

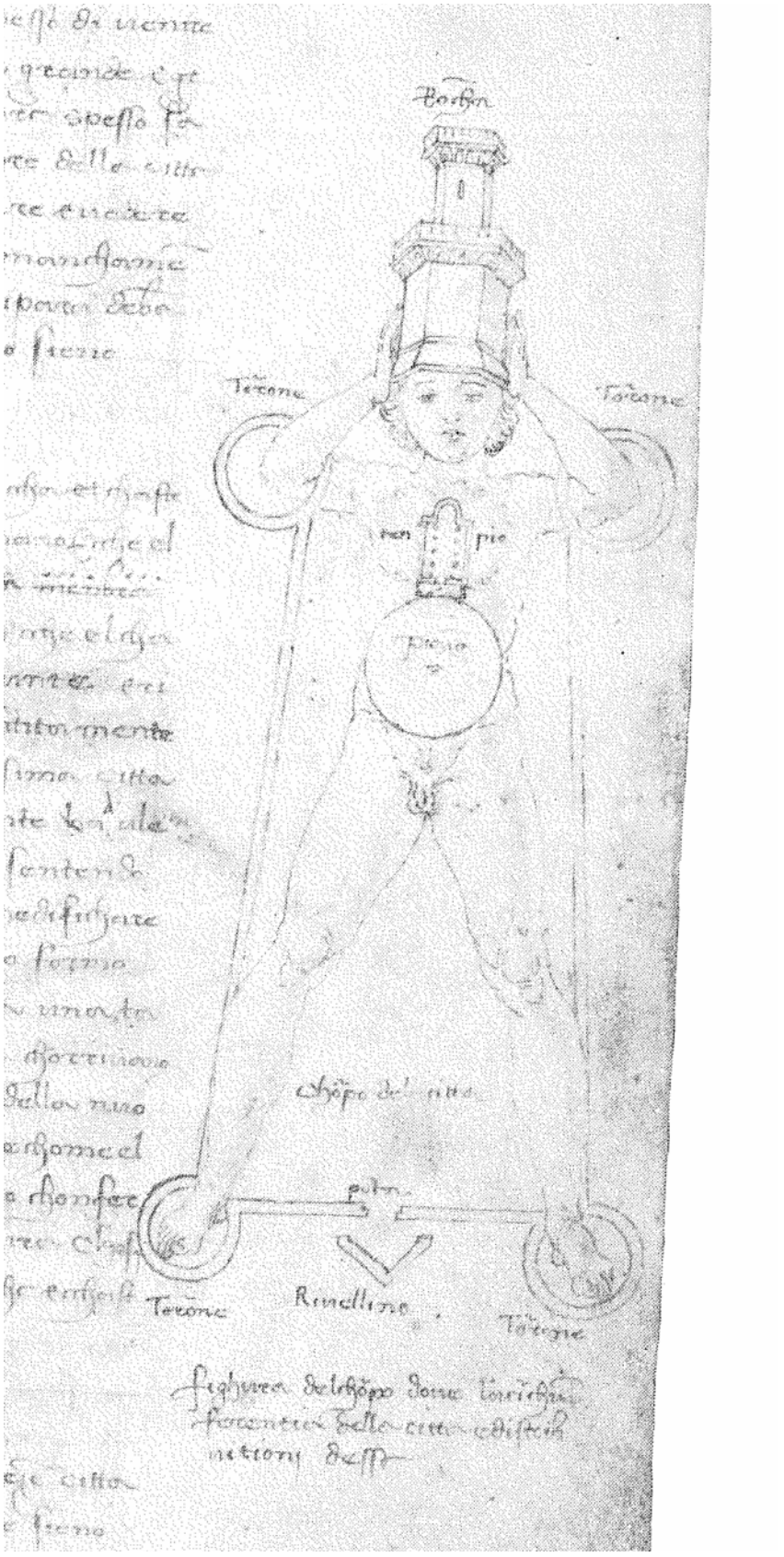

FIGURE 5. T1, F. 3 TAV. 1; ENTITLED: FIGURE AND VARIOUS CONSTRUCTIONS.

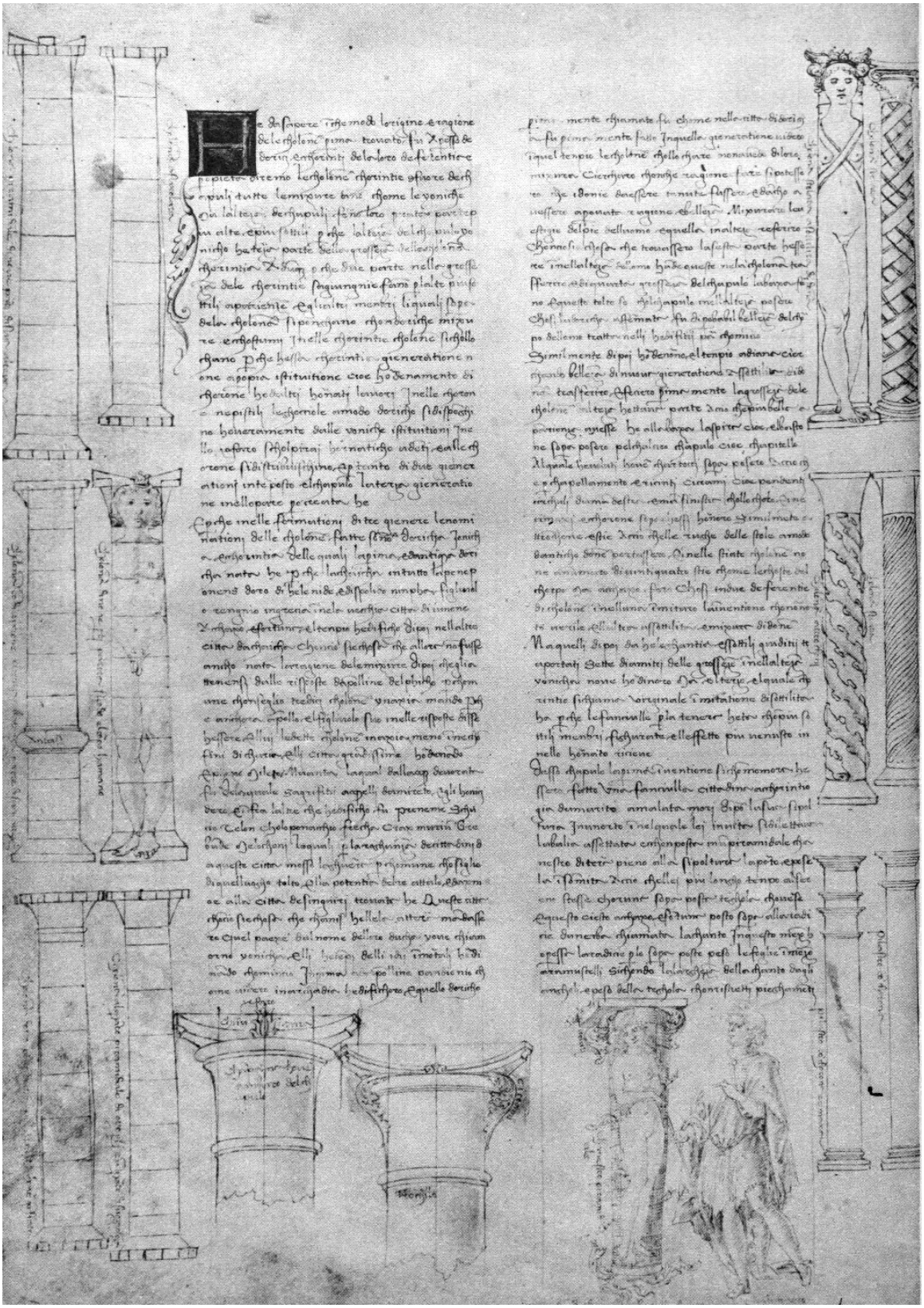

FIGURE 6. T1, F. 14V TAV. 24; ENTITLED: COLUMN, CAPITAL PILASTER

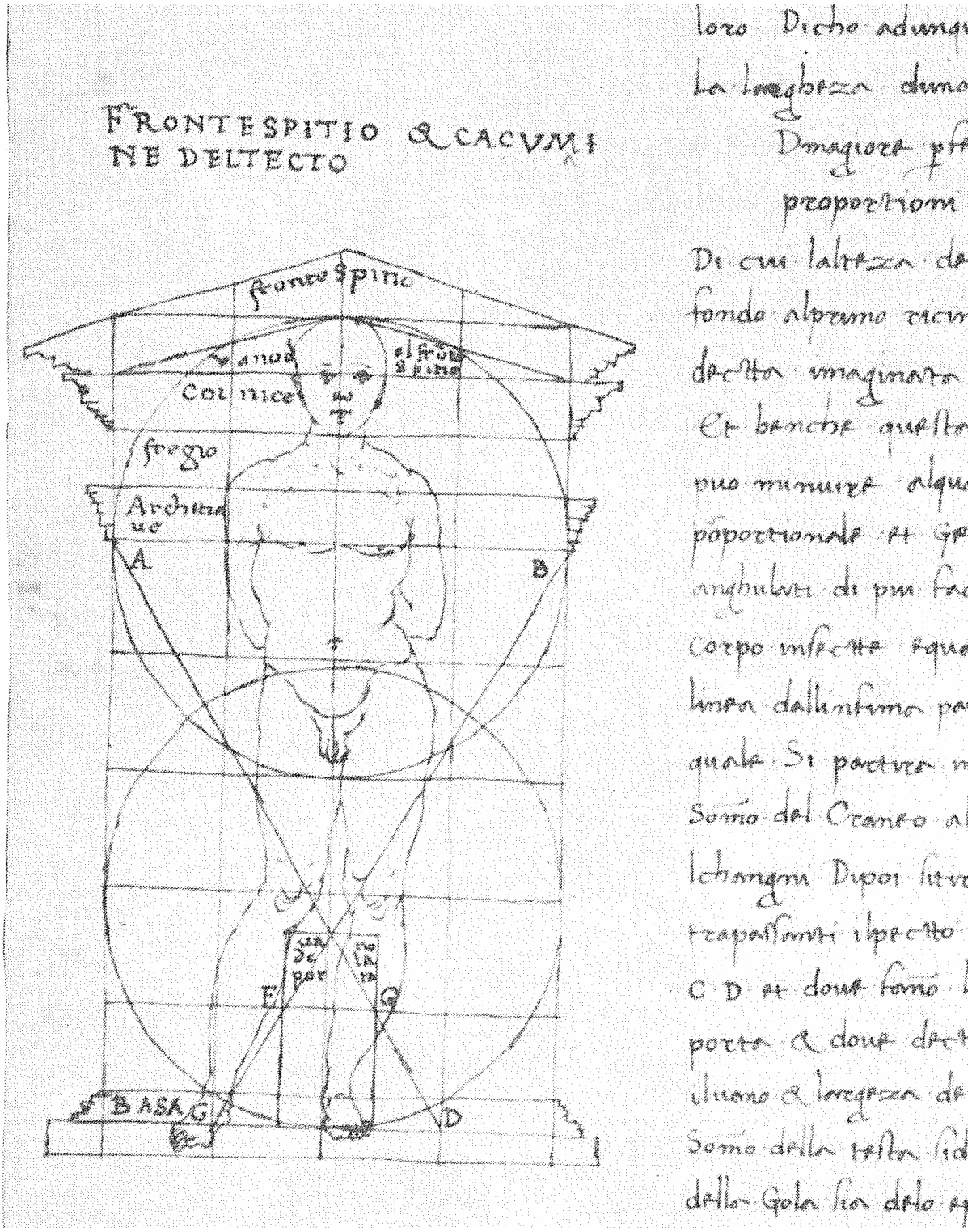

FIGURE 7. T2, F. 38V TAV. 228; ENTITLED: SCHEME OF THE PROPORTIONALITY OF THE FAÇADE OF A TEMPLE WITH A LONGITUDINAL PLAN.

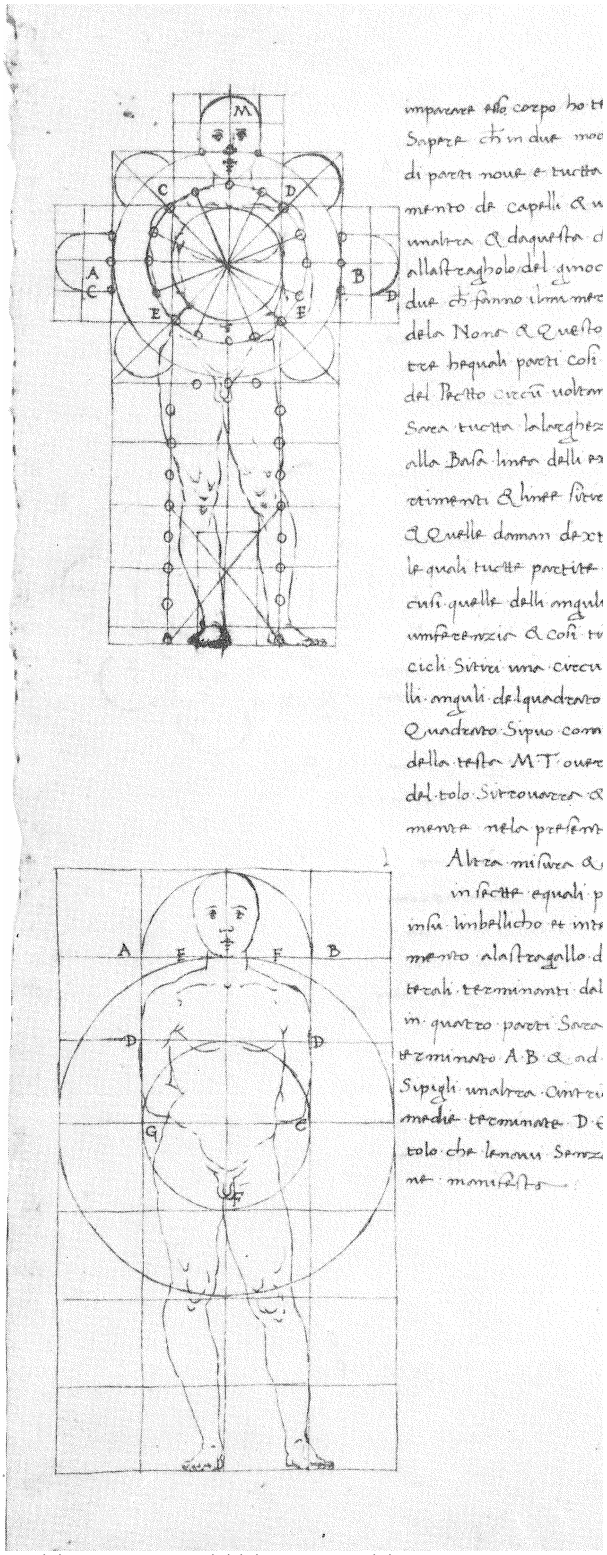

FIGURE 8. T2, F. 42V TAV. 236; ENTITLED: ANTHROPOMORPHIC PROPORTIONALITY IN PLAN OF A TEMPLE WITH LONGITUDINAL PLAN, DIVISION OF THE HUMAN BODY'S HEIGHT IN NINE OR IN SEVEN PARTS.

FIGURE 9. T2, F. 27V TAV. 210; ENTITLED: RECONFIGURATION OF MOUNT ATHOS ACCORDING TO DINOCRATES.

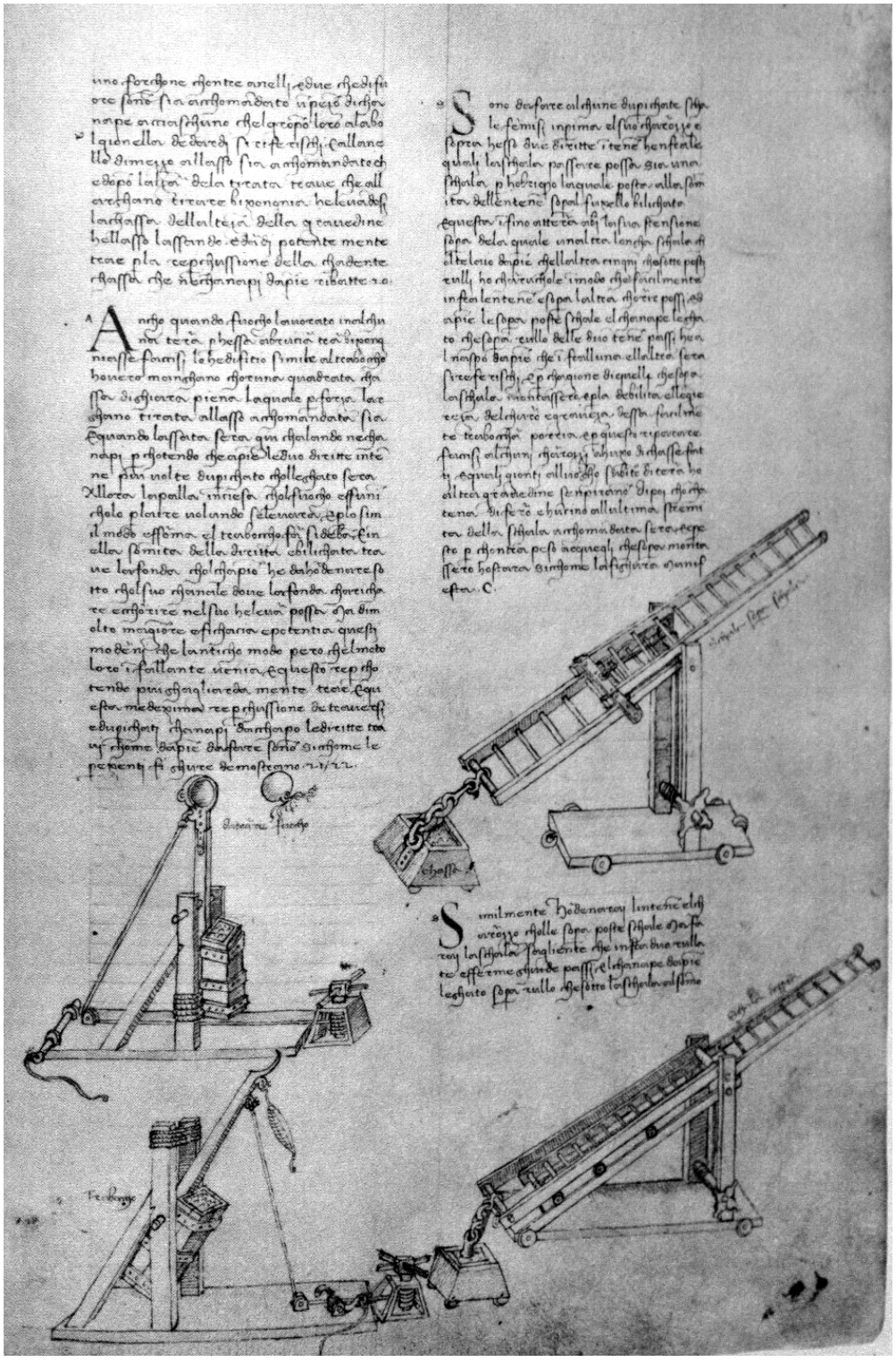

FIGURE 10. T1, F. 62V TAV. 116; ENTITLED: LADDERS FOR ATTACKING THE WALLS.

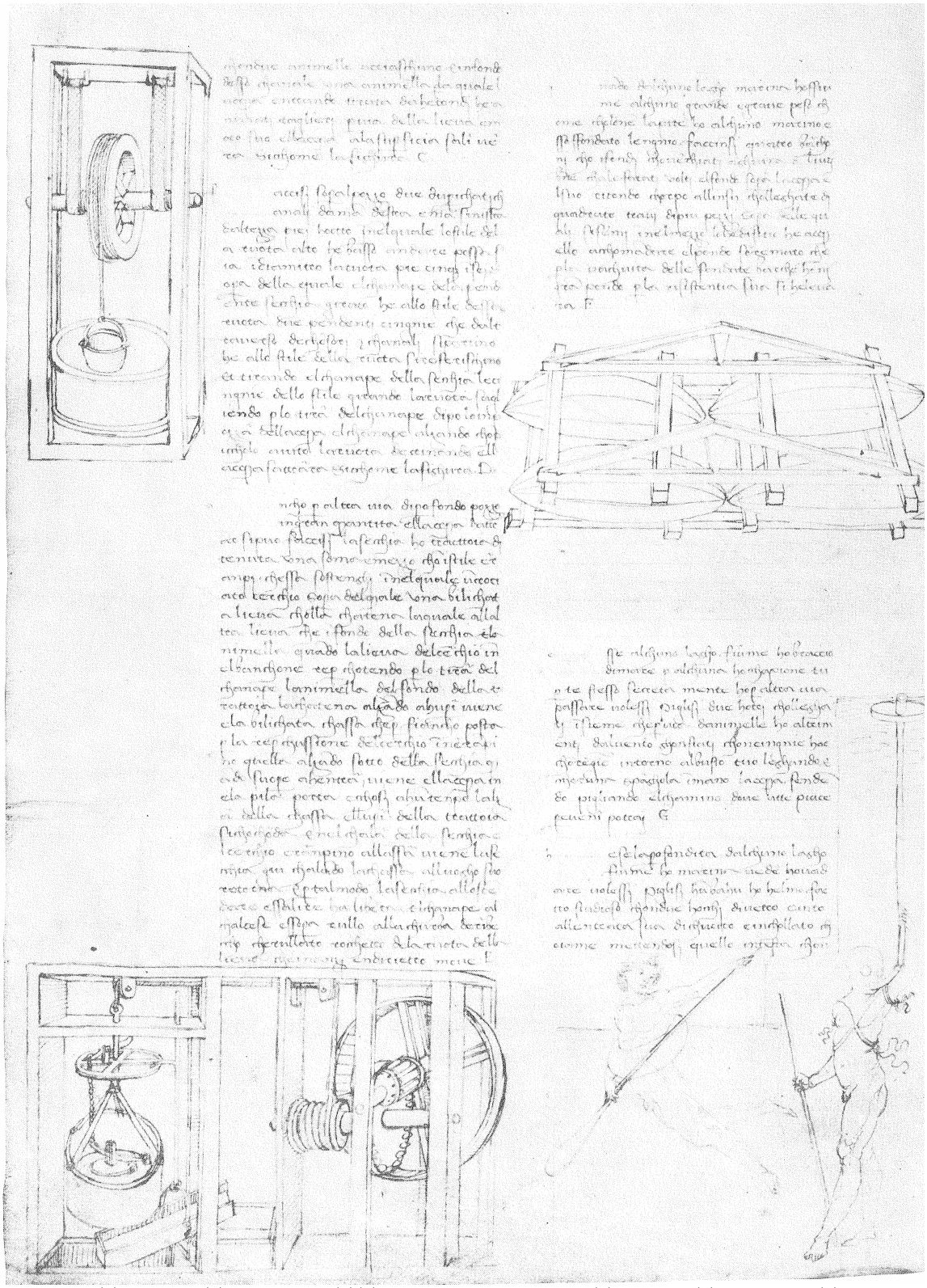

FIGURE 11. T1, F. 66V TAV.124; ENTITLED: MODES OF LIFTING WATER FROM THE WELLS, FOUR-BRANCH *PONTONE*, SWIMMER WITH A RUBBER RING AND OAR, DIVER.

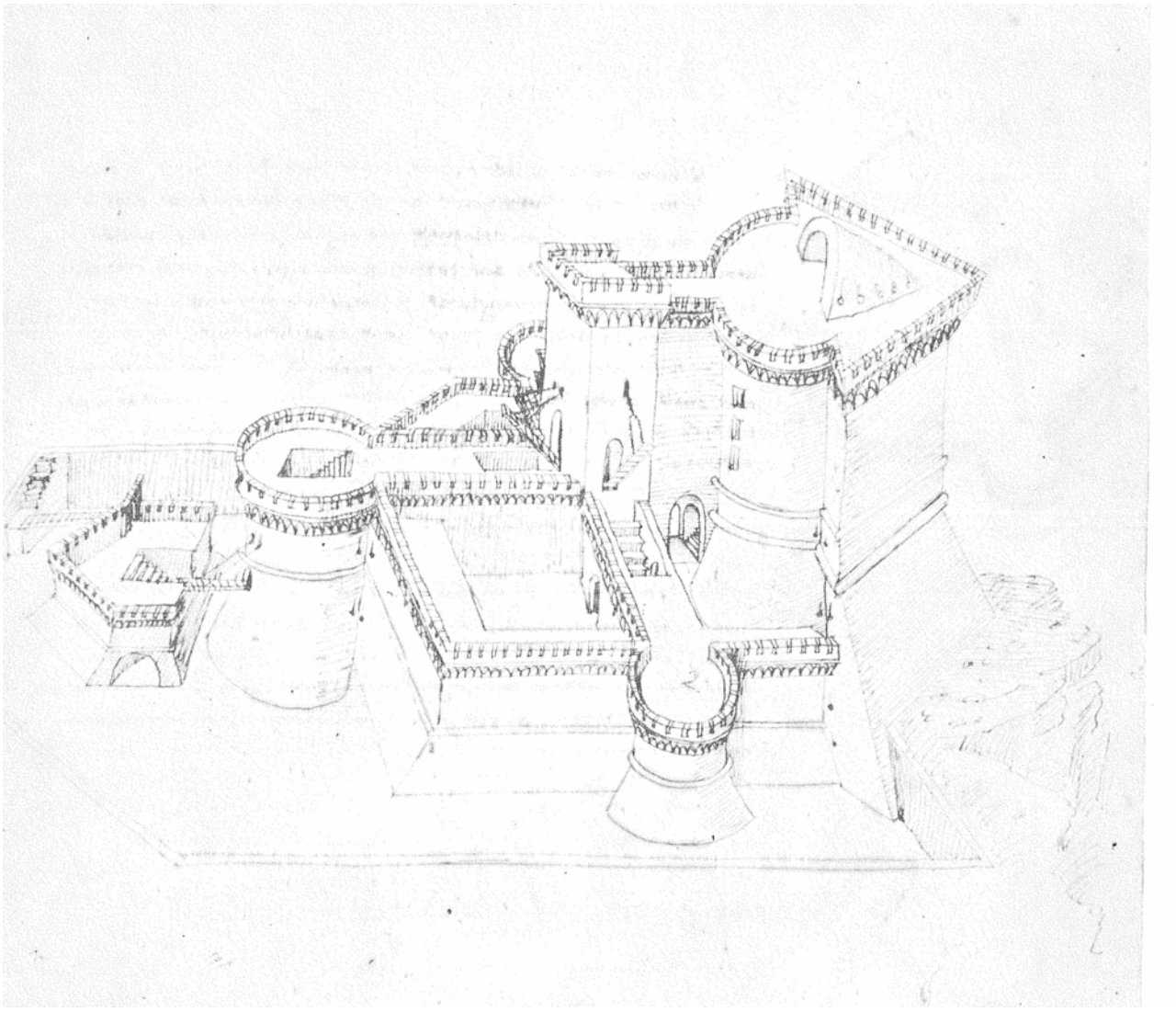

FIGURE 12. T2, F. 79 TAV. 295; ENTITLED: FORTRESS WITH MAIN TRIANGULAR TOWER POINTING TO THE OUTSIDE AND SEMICIRCULAR TOWARDS THE INSIDE OF THE CIRCUIT

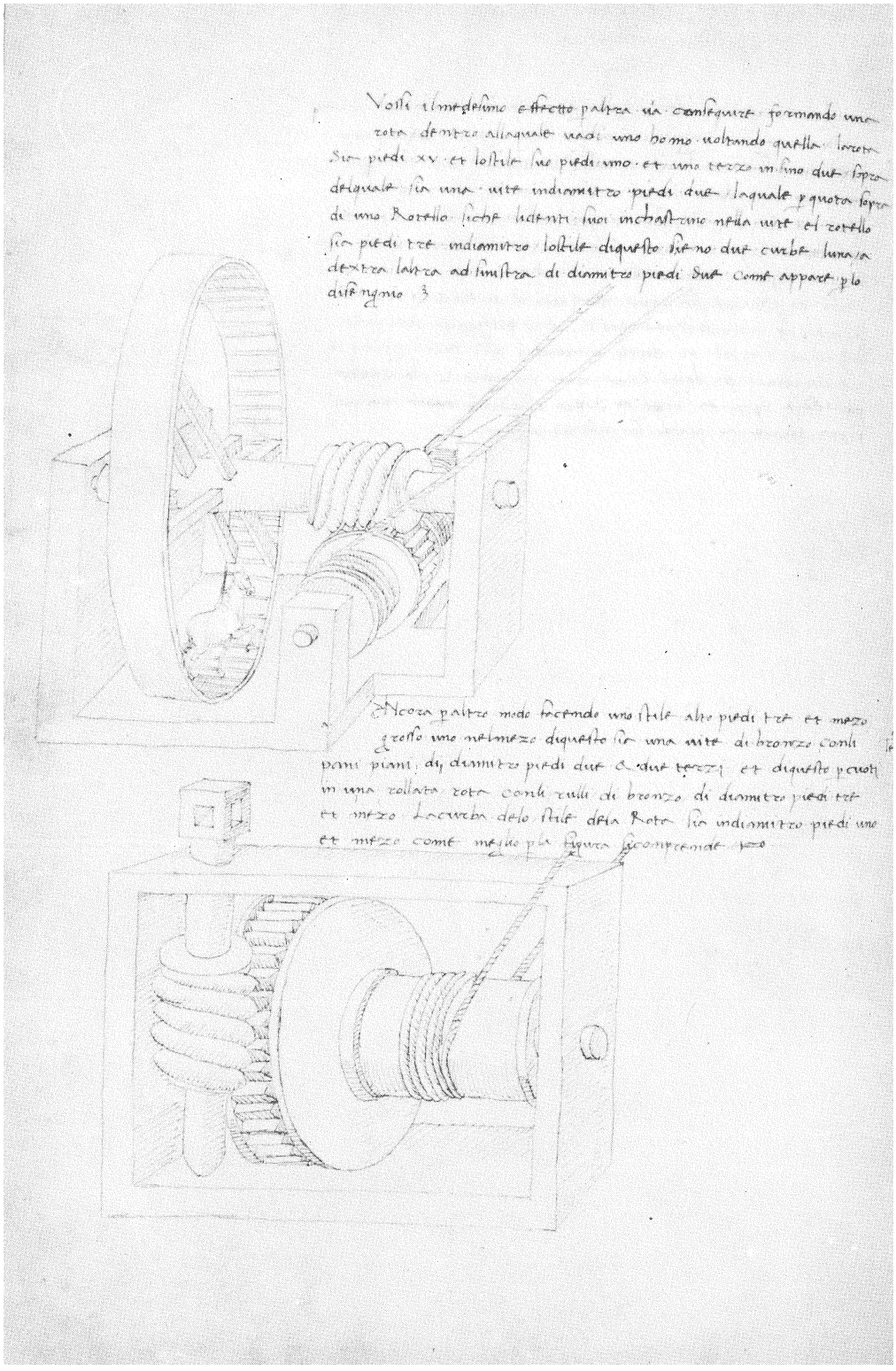

FIGURE 13. T2, F.91V TAV. 318; ENTITLED: WINCH WITH ROPES WITH ENDLESS SCREWS END MOVED BY HORSE, WINCH WITH ROPE MOVED BY ENDLESS SCREWS.

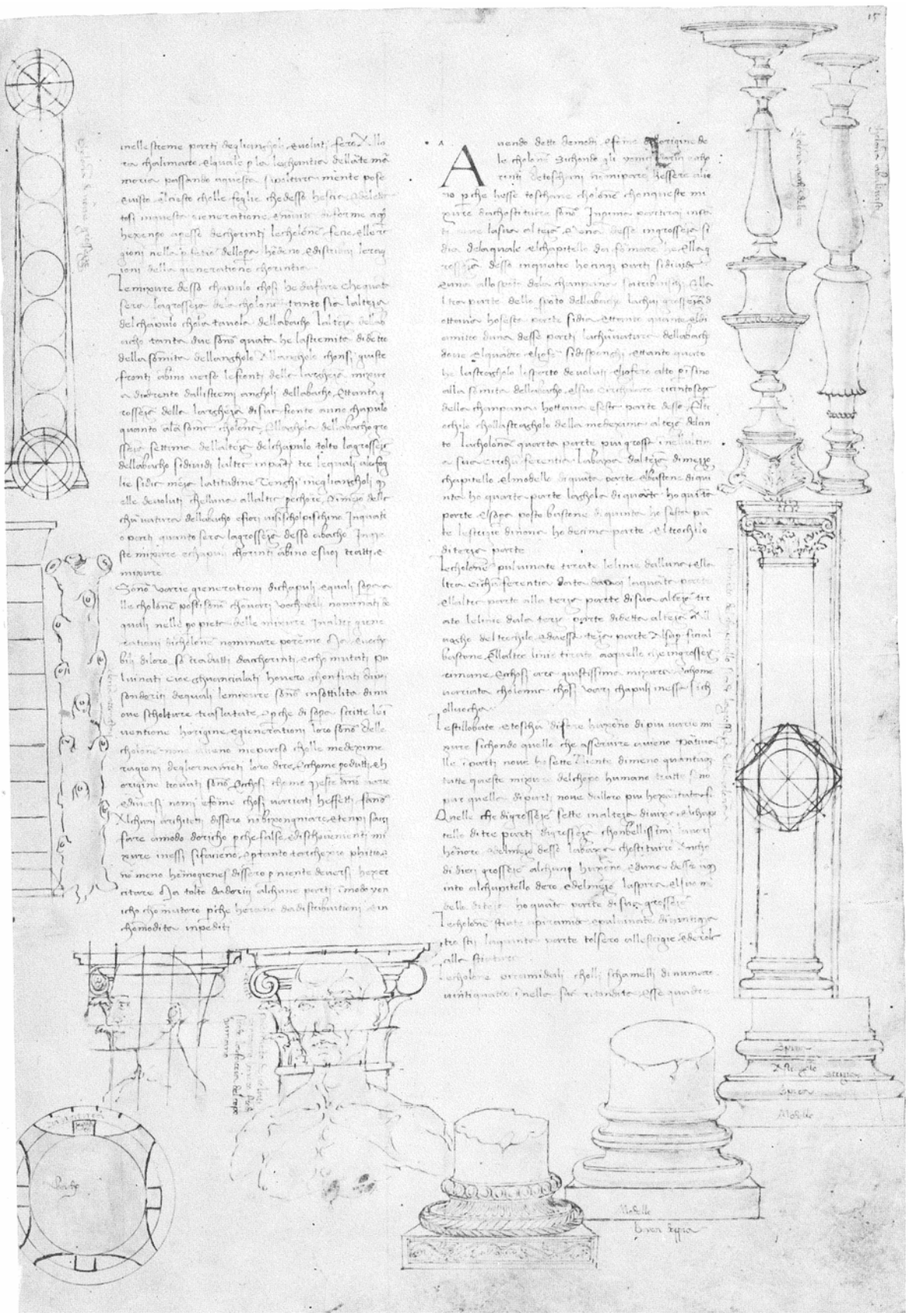

FIGURE 14. T1, F. 15 TAV. 25; ENTITLED: COLUMNS, CAPITALS, BASES.

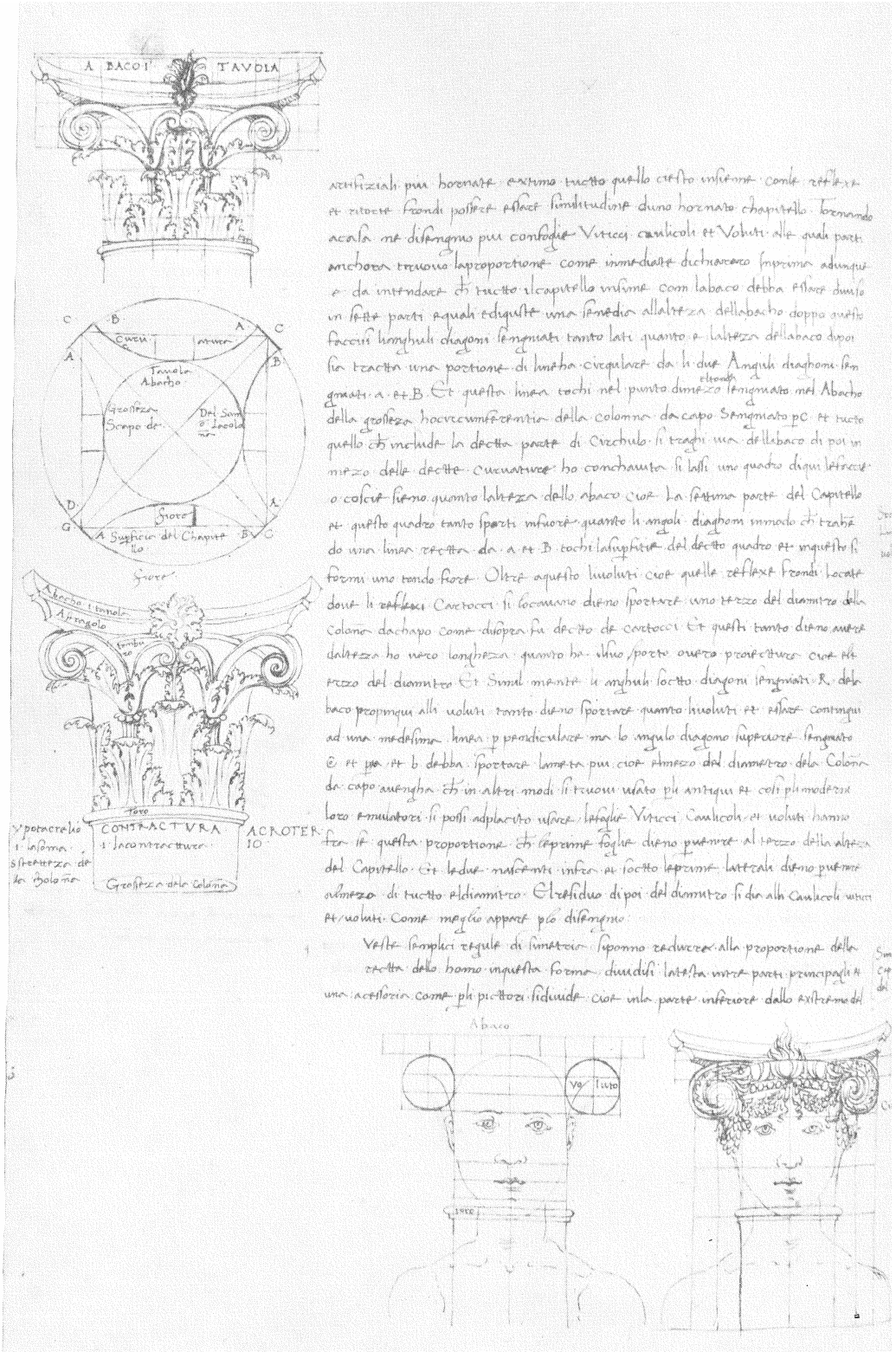

FIGURE 15. T2, F. 33V TAV. 220; ENTITLED: CORINTHIAN CAPITAL AND ITS PROPORTIONS.

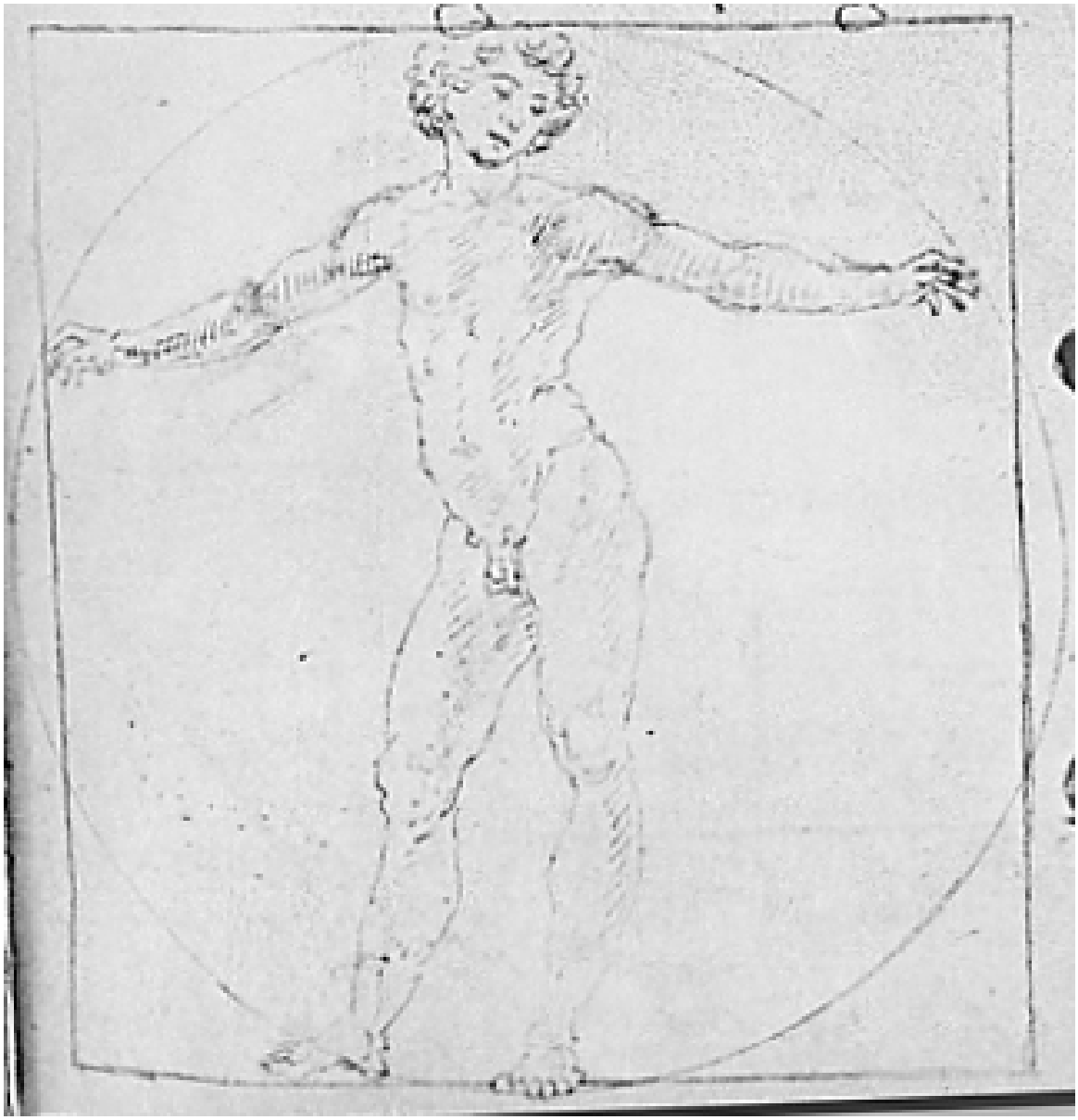

FIGURE 16. T1, F.6V TAV. 8; ENTITLED: PLANS AND PERSPECTIVE OF FORTRESSES, START OF THE CHAPTER ON CITIES AND DRAWING OF THE HUMAN BODY INSCRIBED IN A SQUARE AND CIRCLE.

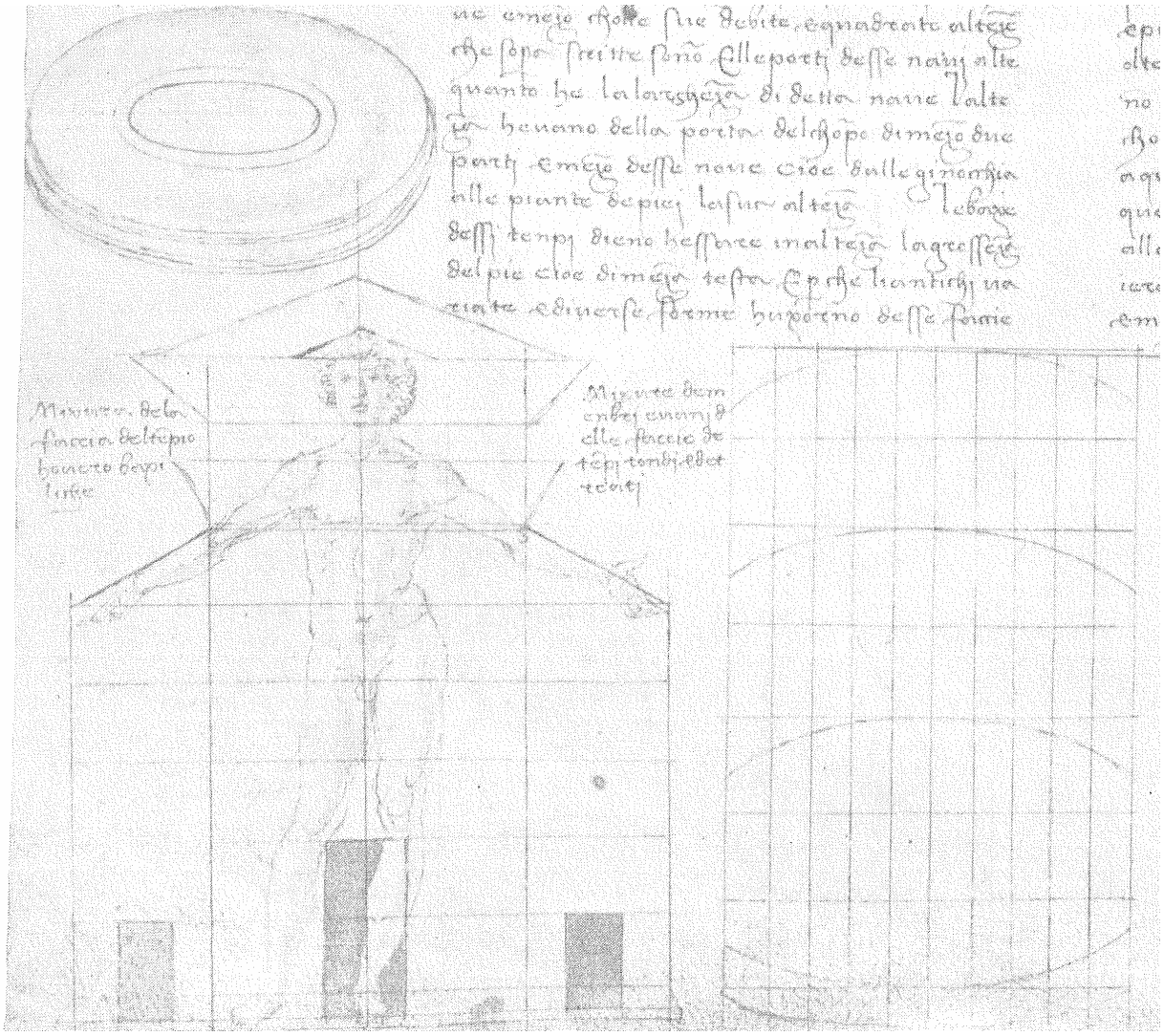

FIGURE 17. T1, F. 21V TAV. 38; ENTITLED: TYPES OF VAULTS AND FAÇADES OF TEMPLES.

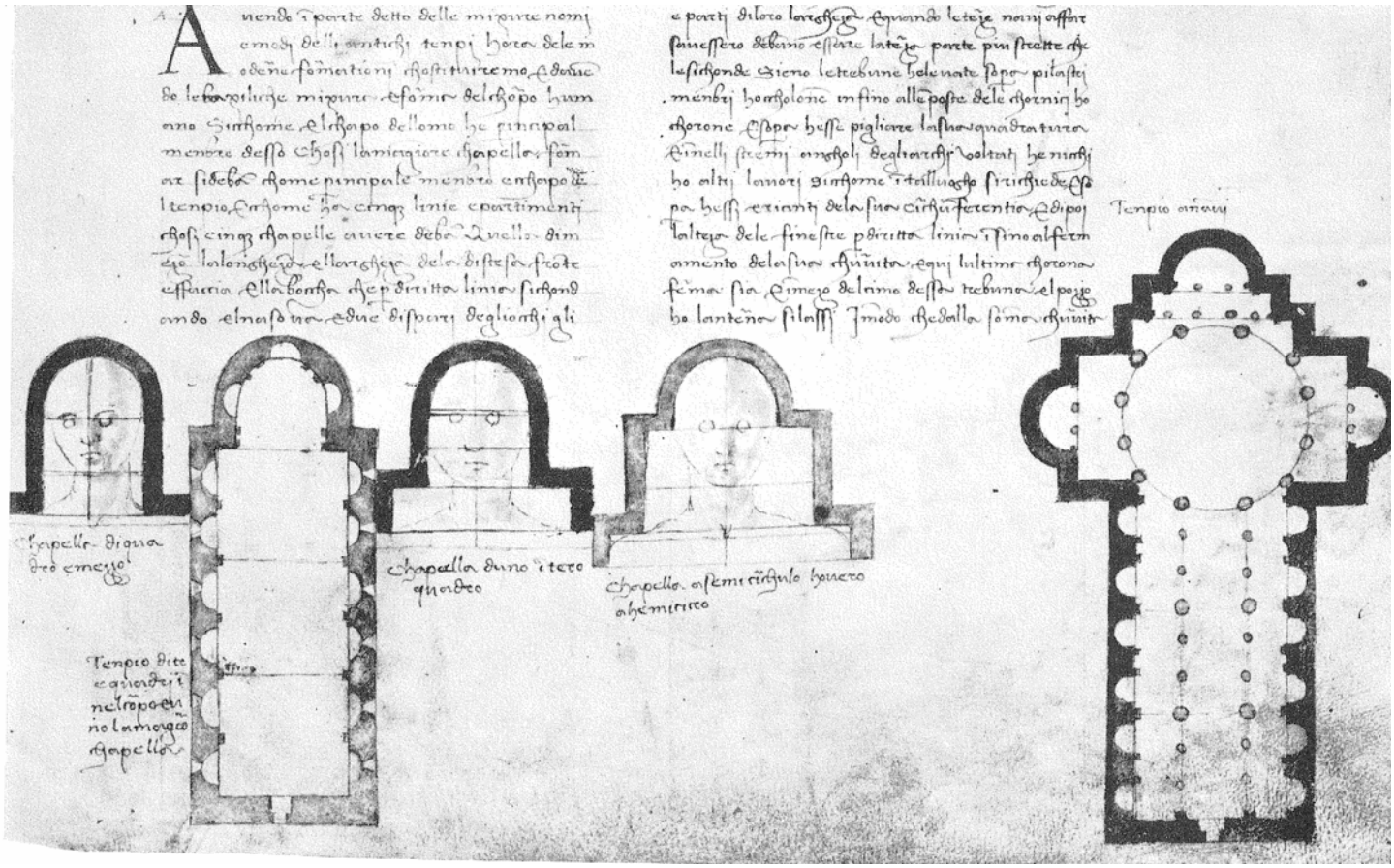

FIGURE 18. T 1, F. 12 TAV. 19; ENTITLED: PROPORTIONS OF TEMPLE AND THE PRINCIPAL CHAPEL)

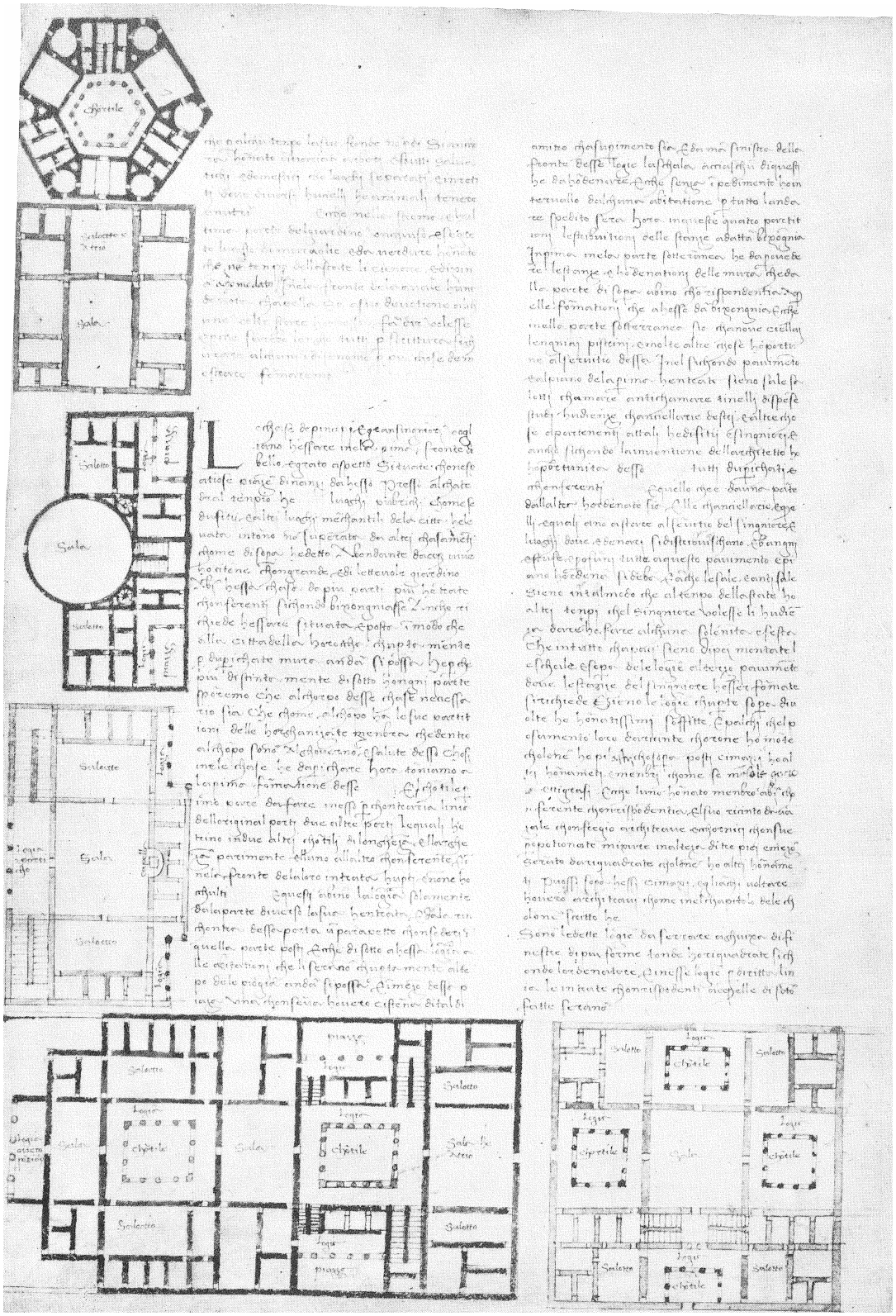

FIGURE 19. T1, F. 17V TAV. 30; ENTITLED: PLANS OF HOUSES.

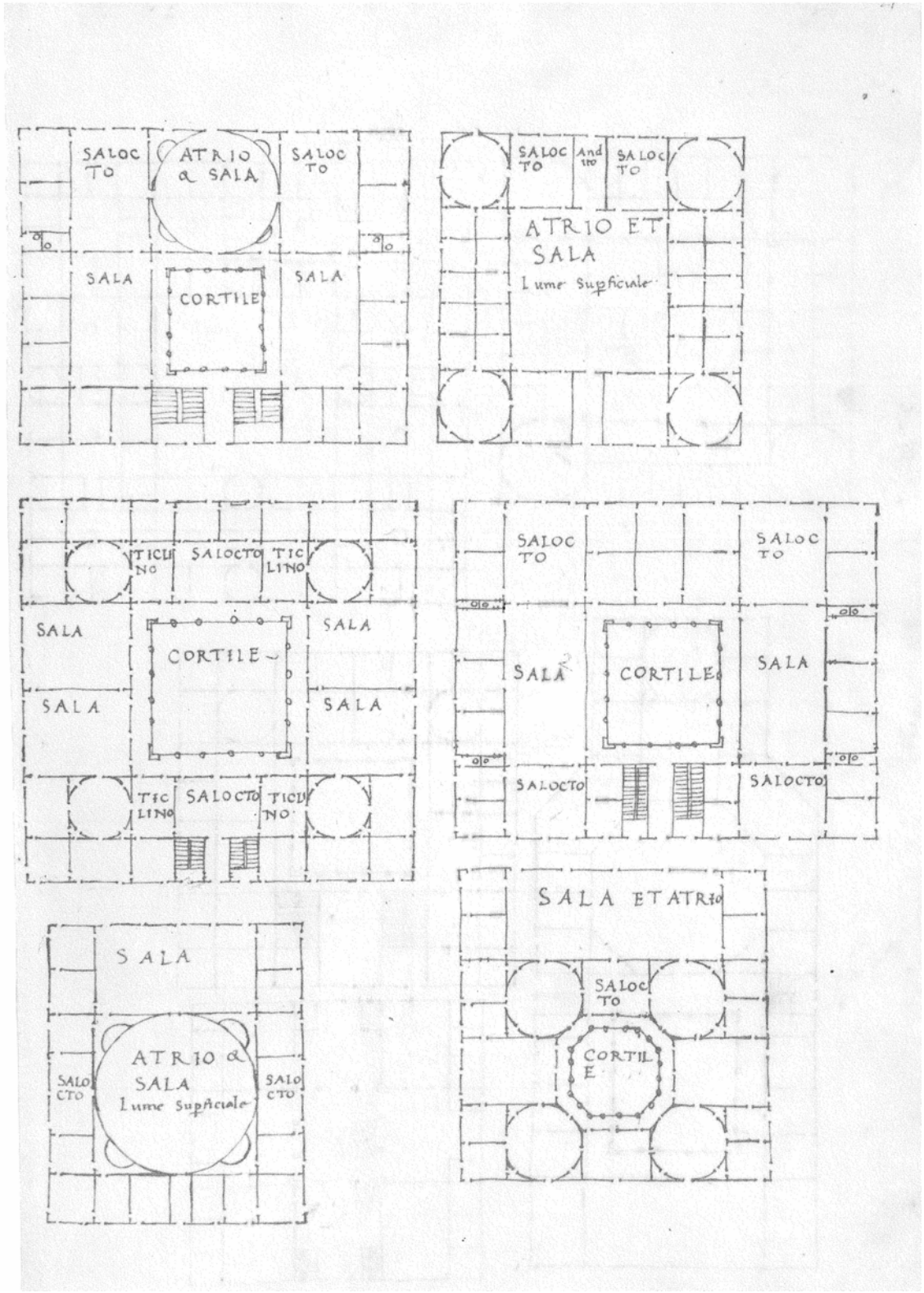

FIGURE 20. T2, F. 21 TAV. 201; ENTITLED: PLANS OF PRIVATE HOUSES OF VARIOUS SHAPES.

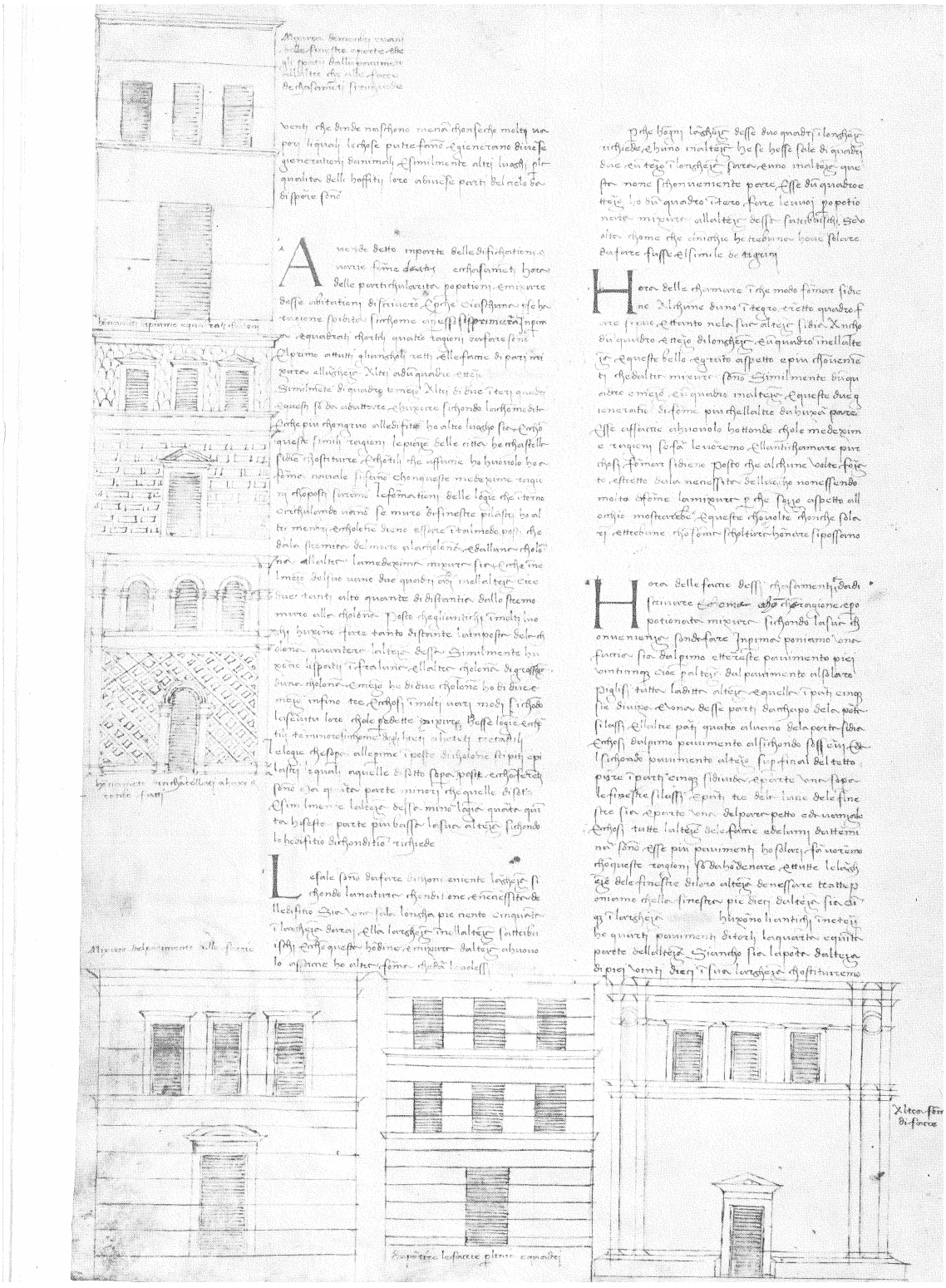

FIGURE 21. T1, F. 20V TAV. 36; ENTITLED: FAÇADES OF HOUSES.

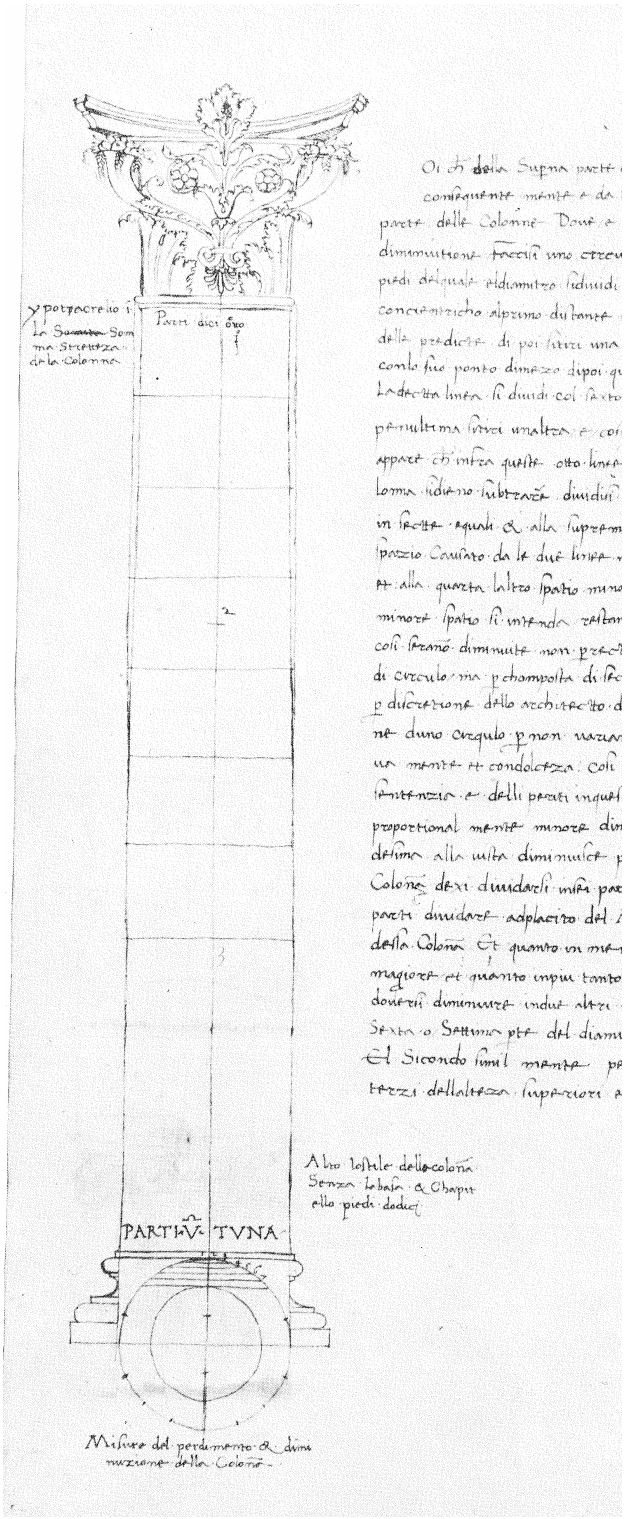

FIGURE 22, T2, F. 34V TAV. 222; ENTITLED: CORINTHIAN CAPITAL AND ITS PROPORTIONS.

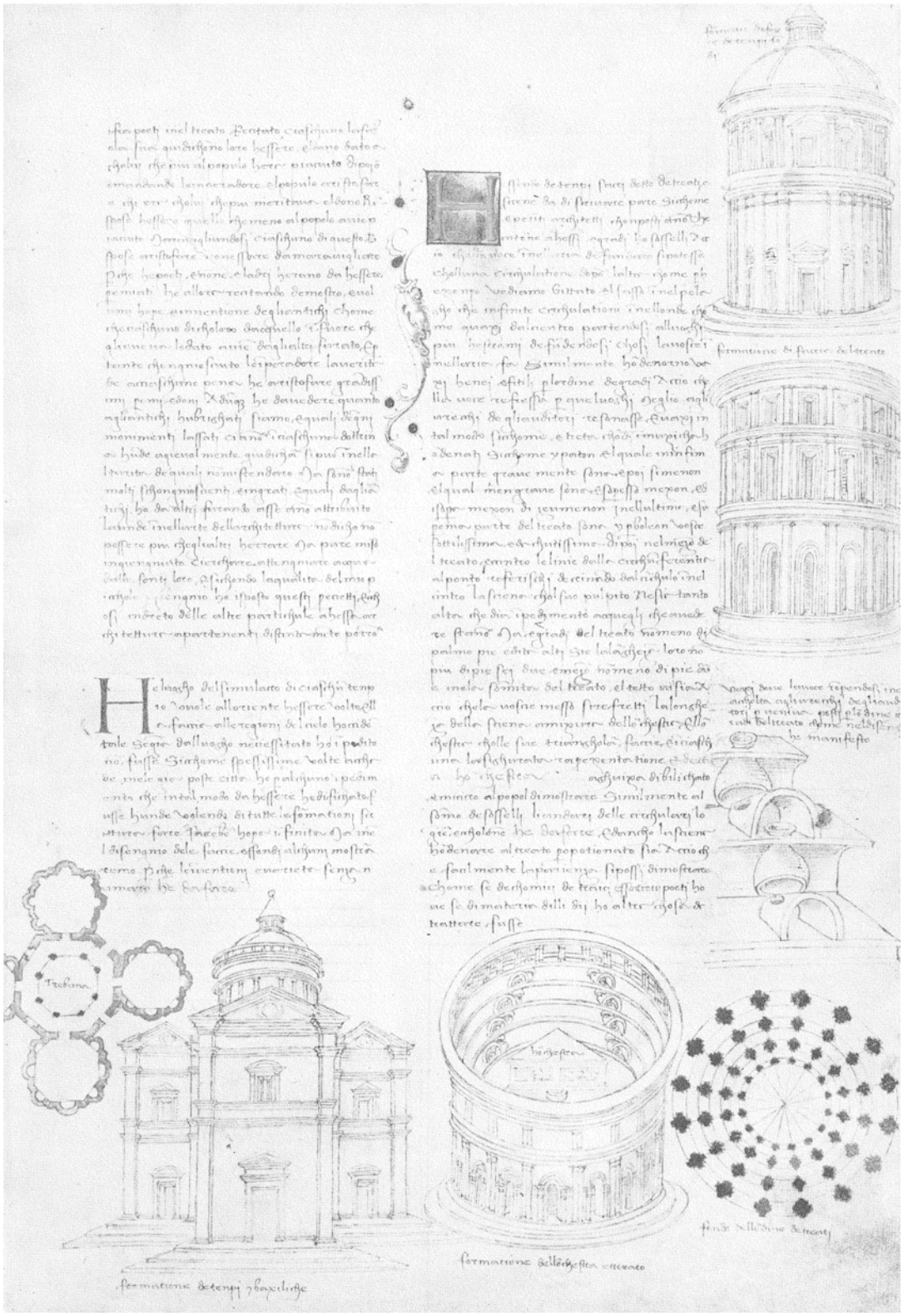

FIGURE 23. T1, F.14 TAV. 23; ENTITLED: TEMPLES, THEATERS, AND RESONATING VASES.

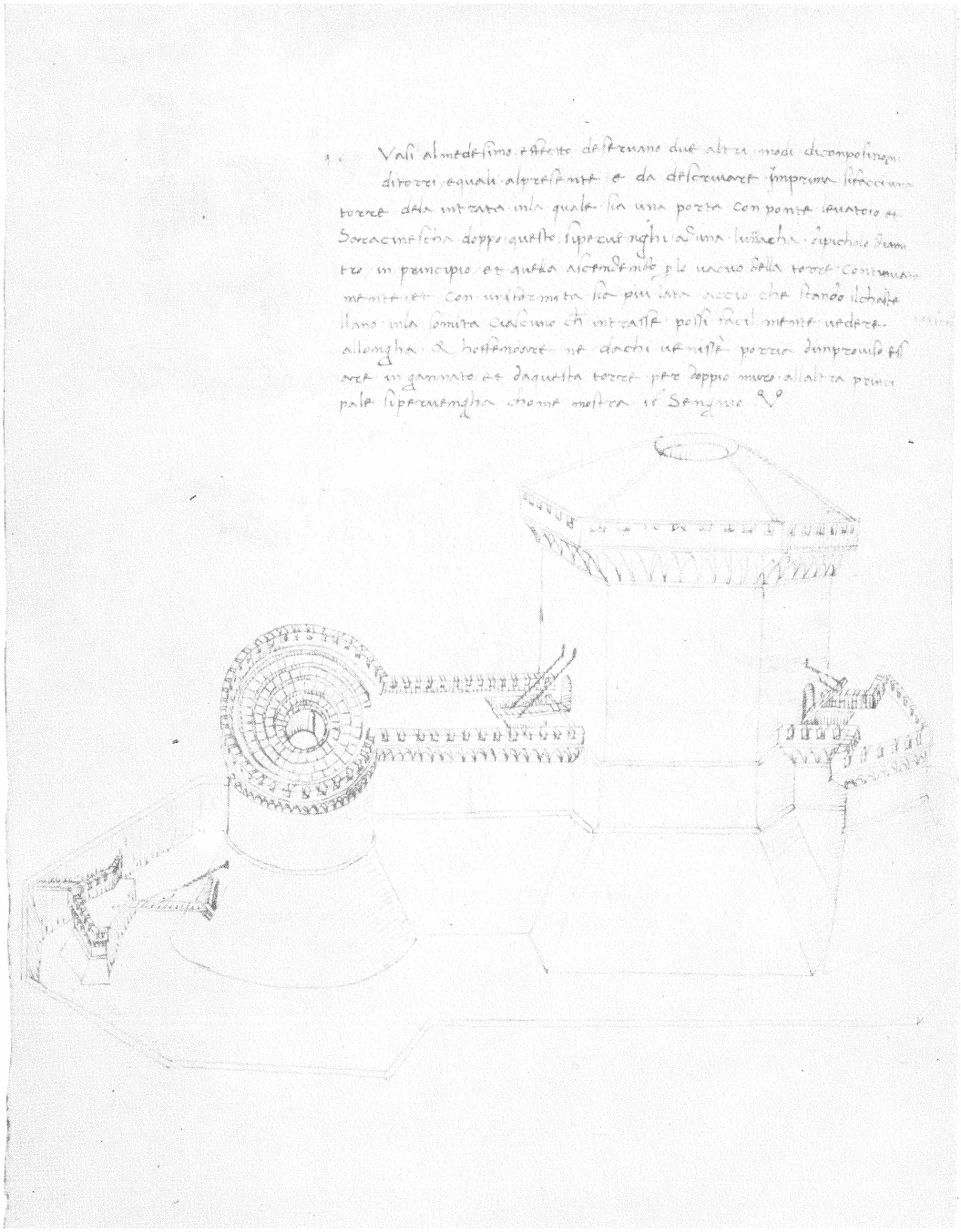

FIGURE 24. T2, F. 83V TAV. 304; ENTITLED: FORTRESS WITH ENTRANCE ACROSS SPIRAL STAIRCASE IN FORM OF A FUNNEL WRAPPING AROUND A GREAT TOWER AND VISIBLE FROM THE *MASTIO*.

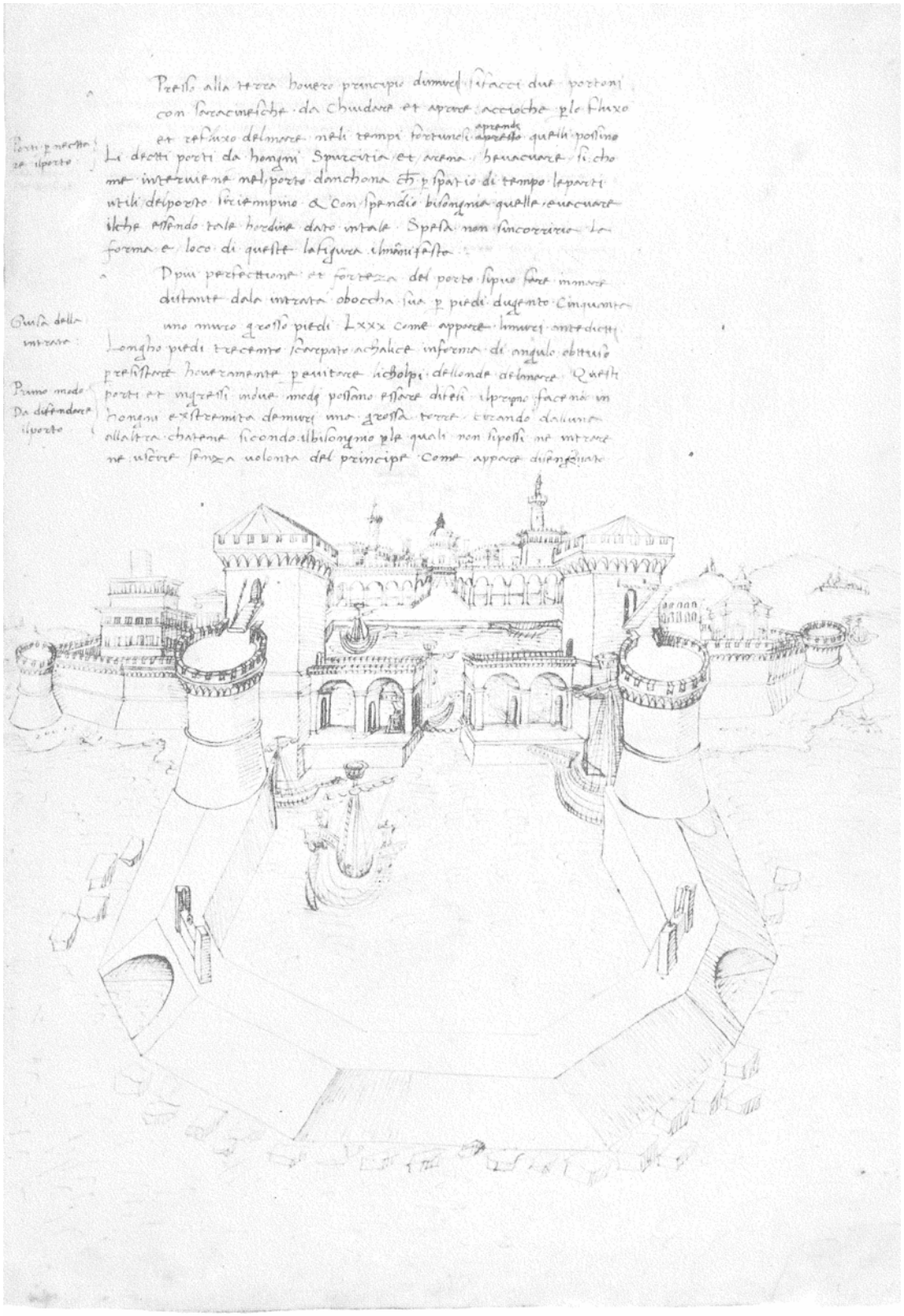

FIGURE 25. T2, F. 87 TAV. 311; ENTITLED: HARBOUR INSIDE THE CITY WITH A POLYGONAL FRONT-HARBOUR - *ANTIPORTO,* TWO ENTRANCES GUARDED BY TWO BIG TOWERS.

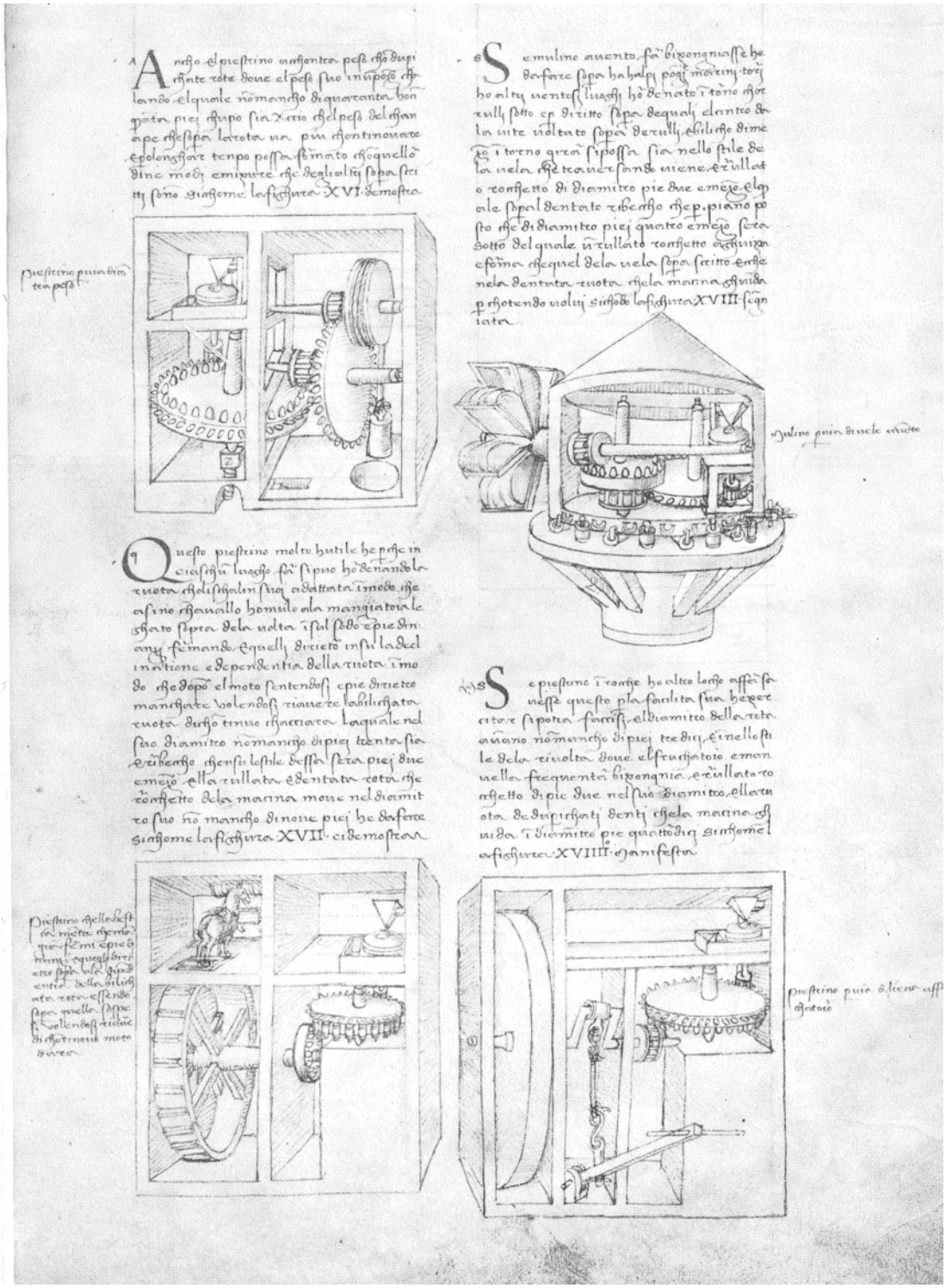

FIGURE 26. T1, F. 38 TAV. 71; ENTITLED: MILL BY COUNTERWEIGHT, MILLS MOVED BY ANIMALS AND MAN, WINDMILL.

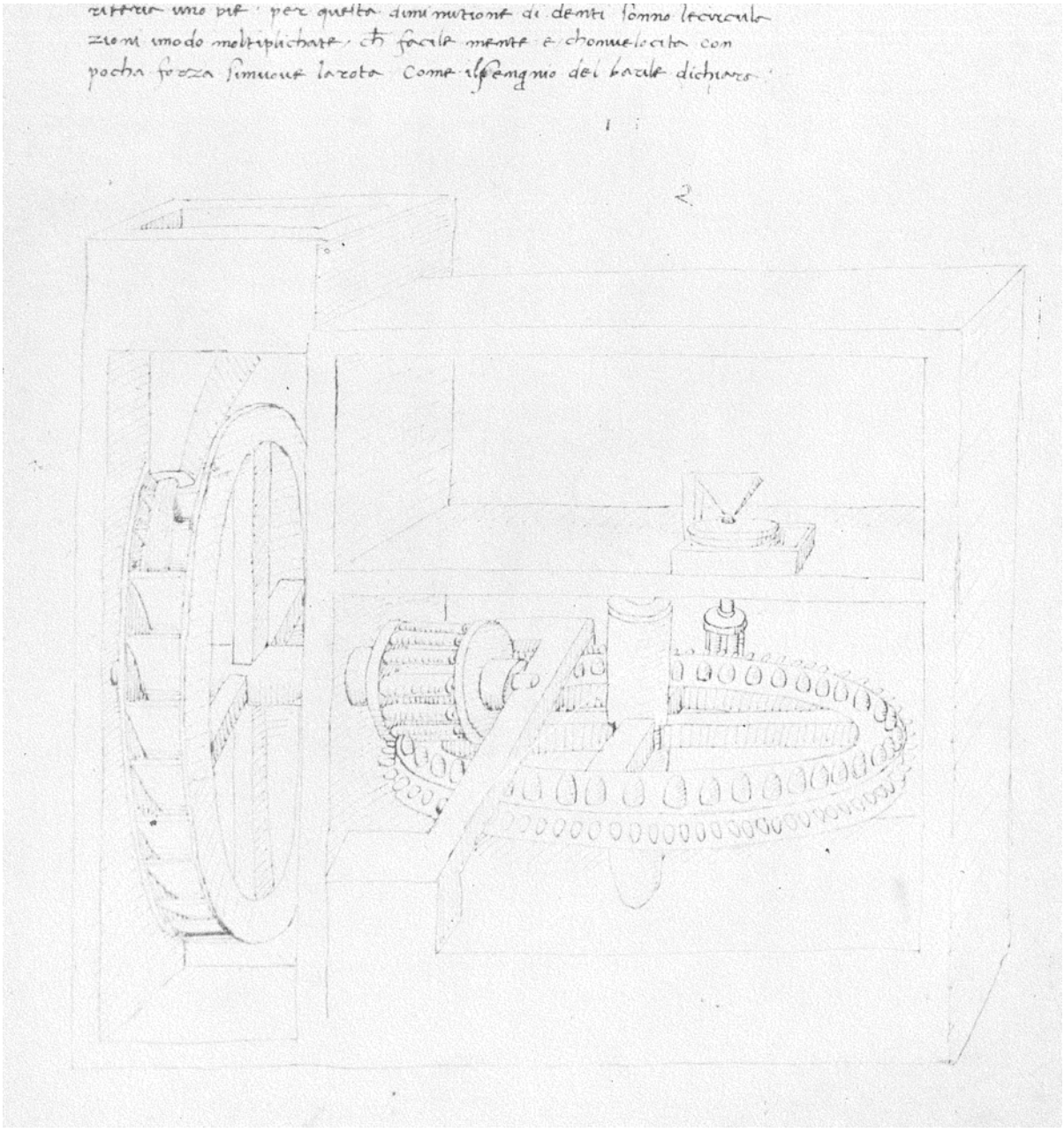

FIGURE 27. T2, F. 95 TAV. 325; ENTITLED: MILL WITH FALLING WATER

FIGURE 28. TWO FEMININE FIGURES
Circa1475-1480
Gabinetto Disegni e Stampe, Uffizi, Florence, inv. 36 E, pen on parchment

POSTSCRIPT

"I cannot help feeling, Phaedrus, that writing is unfortunately like painting; for the creations of the painter have the attitude of life, and yet if you ask them a question they preserve a solemn silence. And the same may be said of speeches. You would imagine that they had intelligence, but if you want to know anything and put a question to one of them, the speaker always gives one unvarying answer." [1]

Socrates conversing with Phaedrus

POSTSCRIPT

OVERTURE

In retelling the story of modeling portraits[2], Pliny says that in Corinth a young woman in love, chagrined by her lover's departure, tried to capture his portrait on the night of his departure by tracing the shadow of his face reflected on a wall. Upon seeing this, her father Butades, a potter, applied clay to the traces, and made a relief out of his daughter's drawing. This tale, which became an inspiration for many paintings that depict the origin of drawing or painting, bears interest for us as well. In the story, the young maid traces the outline of her beloved's face; recording what is and is

1 Plato, Phaedrus, translated by Benjamin Jowett, online source: http://classics.mit.edu/plato/phaedrus.html.
2 "Butades, a potter of Sicyon, was the first who invented, at Corinth, the art of modeling portraits in the earth which he used in his trade. It was through his daughter that he made the discovery; who, being deeply in love with a young man about to depart on a long journey, traced the profile of his face, as thrown upon the wall by the light of the lamp. Upon seeing this, her father filled in the outline, by compressing clay upon the surface, and so made a face in relief, which he then hardened by fire along with other articles of pottery." Pliny the Elder, Natural History (Cambridge Mass: Harvard University Press; London: W. Heinmann, 1947-63). Book XXXV, Chapter 43, *'The Inventors of the Art of Modelling'* .

not. Drawing simultaneously records presence and absence, mediates between the visible and the invisible, negotiates with and recreates time, and acts as an intermediary stage between the actual and the imperceptible.

Architectural drawing can specifically be understood (in a modern formulation) in terms of three stages of life. At first drawing conveys the architect's ideas and makes tangible the process of thinking. Then drawing becomes a tool of communication, a conversation with a potential audience. As well, drawing becomes a highly instrumental and powerful means to orchestrate and realize the construction process. However, not every drawing embodies and combines all three elements of this tripartite schema. It is important to restate that the stages are not as categorical as one might think, as there are many overlaps, slippages and reversals during the process of an architectural project. As in the drawing described in Pliny's tale, architectural drawing in its richest manifestation imbricates imagination and realization. This is one of the essential qualities of architecture and architectural drawing investigated in this dissertation, and Francesco's work is both its illustration and its elaboration.

The main question addressed by this dissertation is whether Francesco's use of drawings, not a novelty in itself, was original and whether it became the principal vehicle of his architectural thought. I have endeavoured to show how drawing, or more precisely the drawing-text combination, becomes a vehicle for theoretical concepts in Francesco's work. As we have seen, Francesco's message bears resemblance to contemporaries such as Filarete and Alberti in many instances. However, what distinguishes him is not the existence or the quantity of his drawings in the *Trattati*, but in his persisting with, and making a case for his theory through drawing. True to the Vitruvian notion of cunning intelligence, Francesco employs his own intelligence and imagination (*sottile imaginazione)* in devising a medium that gives life to inanimate text. Through his drawings, he captures what is essential to his subject. In his hand, drawings preserve and even develop their own autonomy, refusing to be reduced to a mere tool for representation or construction. So doing, his drawings in their own turn reinforce the text, inviting a deeper movement into the architect's thought on the part of the reader's exploring eye. Francesco's drawings are both rooted in memory – through a meticulous exegesis of ancient material and classical sources – and strong in their imagination: they allow for invention and creativity. For Francesco the drawing is not only an *aide-memoire*, a means of communication for ideas and a tool of representation. It goes beyond demonstration to seduce, inspire, and ultimately capture the viewer's mind.

While I would abstain from reading a perfectly continuous lineage and gradual progression of drawing through the Quattrocento,[3] the existence of a series of episodic, individual, and unique inquiries and developments across the Renaissance through which artists and architects likely tangentially influenced and at times empowered each other would be undeniable. In that spirit, Francesco's drawings in the *Trattati* are particularly significant as among other things, they hinted at yet unexplored potentials and encouraged an investment in drawing by the generation who followed. Works of Bramante, the Sangallo brothers, Raphael, and ultimately Michelangelo demonstrating either an implicit or explicit influence from Francesco exhibit more faith invested in the act of drawing. Among other factors, the slow but constant gaining-ground of *perspectiva artificialis* in the space of architectural drawings, concern for clarity and communicability, and heightened interest in drawing as a discipline, are only a few of the outcomes that emerged in the generation that followed the theorists of the Quattrocento.

Without any intention to neglect developments between the 15th century and the current time – from descriptive geometry to the transformation of imaging by the invention of cameras and other optical apparatus – the last few paragraphs of this dissertation aim at juxtaposing the development of drawing in the Renaissance and the propagation of digital media in our time. During the past few decades, the development and proliferation of digital media has been at work transforming the basis of architectural practice. This rapid transformation, which has been embraced and implemented by representatives of the profession all over the globe, has resulted in a major change in our modes of operation and thus affects our understanding and use of drawing. These modes of operation have their roots in what we had inherited from the Quattrocento onward, and include orthographic projections, *persectiva artificialis*, and isometric drawings.[4] These developments were built into the practice of architecture through which our deep connections to the past have continued and evolved through the act of drawing. Yet, their contemporary manifestations involve a profound loss – a loss specifically of those qualities of drawing which were developed in Francesco's work.

In the past decades, digital media have been consistently in search of methods and means to broaden the boundaries of their realm of operation. The otherness of our source of drawing today is

3 Frommel, Reflections, 101. Frommel argues for a continuous, gradual maturing process from 1230 to the end of the 1400s.

4 Almost all the above-mentioned types of architectural drawing found their more established form in later centuries. During the Renaissance, the correspondence between plans and elevations were fortified, yet projective geometry was developed later in the 17th century. While *perspectiva artificialis* was developed during the Quattrocento, it became common practice in the architecture discipline only later in the 17th century. Isometric drawings were elaborated during 19th century, yet some examples of parallel projections occurred in the Renaissance.

one that is both critical and undeniable. Our tool for drawing (which had been a part of our body, and in our control), exists outside our own being and within the realm of computers, and relies on different software, each with a specific range of performance. Without intending to over-generalize, it appears that even the more engaging digital practices suffer from two specific symptoms, which are not unrelated to each other. On the one hand, the dominance of the "form-centric" practices stands out; and on the other, the insistence on different degrees of elaborate "processes" emerges as a prominent trait. Whether one's practice starts with an emphasis on either form or process, despite their seemingly different emphases, the results seem to be caught in the circle marked out by the oscillation between them. On the other hand, mainstream architectural practices, which use such media with little reflection, have developed a tendency toward an abundance of image-making. The visual proliferation however stays at a superficial level and denies both the author-architect as well as the viewer a deep engagement with the subject matter.

The underdevelopment of a theory or theories that would structure and ground those methods and means indicates a significant lack. In lieu of a preoccupation with the process or the appearance of the outcome, such a theory or theories could render the outcome evocative by rooting it in the context of architectural history, cultural experience, and modes of inhabiting architectural spaces. If they could offer insights into this context, while being critical of the processes developed, such theories would become portals to a more significant interaction with these new means of exploration and communication. Francesco's rendition of his ideas in the *Trattati* offers a meaningful way of theorizing architecture which, while maintaining a strong visual basis, never succumbs to the merely visual, to mere process or form. That succumbing is the principle failure of many contemporary practices preoccupied with digital representation. To see what the understanding of theory implied in Francesco's work can offer us in this situation, we must briefly place it in the context of the notion of rhetoric. This will underline for us what it is that is missing in the rhetoric implied by many of today's architectural images.

Essentially, in its pre 19th century existence, rhetoric can be defined as the ability to develop a discourse through the effective use of language. Together with grammar and logic, rhetoric invests in language in order to communicate and put forward ideas, develop arguments and truly connect one's ideas to another or many others at once. In this manner the aim of such rhetorical practice is not far from that of a theory of architecture, which likewise is a vehicle through which anticipated ideas will be shared and reflected upon. Aristotle defined Rhetoric as "the faculty of discovering the

possible means of persuasion in reference to any subject."[5] So, for example, writing a theory of architecture involves in part putting forward a series of thoughts or ideas that are to be persuasive in order to capture an audience. If we understand drawing as a medium that allows for different levels of mediation, the most straightforward (even banal) outcome of such an understanding would be to expect these media to be communicative, capable of capturing and holding one's attention. In this limited sense such contemporary works fall within the realm of rhetoric. But in fact writing – or drawing – such a theory demands much more if it is to be truly rhetorical in Aristotle's sense.

In explaining that Rhetoric is based on proofs, which are divided into inartificial and artificial ones, Aristotle breaks down the artificial proofs into three categories: the first one is of an ethical nature, *ethos*, emanating from the moral character of the orator; next is *pathos*, or the emotional, which aims at creating a specific atmosphere for the audience; and the last one, *logos*, is the logical character which is embedded in the speech and is the reasoning itself. Here I focus on the first of these terms.[6] If *ethos* in general is the character and credibility of the speaker influencing the audience's reception, we might infer it in Francesco's character as emanating from his hand and finding a visual manifestation on the page. Chapter Three of the present work aimed at following the traces of the architect from the pages of his sketchbook to his two treatises. A persistence of character, of *ethos*, is palpable through the evolution and transformation of Francesco's thought as demonstrated in this case. Through many references in the dissertation, and specifically the drawings discussed in the conclusions of each chapter (some of which came from outside the pages of the *Trattati*), a certain character of the author emerges and influences our understanding of the work.

Francesco's *ethos* extends beyond this, however. His arguments in words and drawings are unique and particular to his imaginations and fantasies, yet at the same time, they are culturally rooted in his world. They connect broader issues of beliefs and traditions of architecture and culture to a particular formulation that originates from the hand and the mind of the architect. This historical positioning is crucial. If we could borrow Filarete's analogy of will and reason[7] for a moment, in which the figure of will is always presented with three heads simultaneously representing past, present, and future, similar characteristics can be recognized in Francesco's drawings. His drawings connect to the past, be it ruins, the aspiring principles of antiquity, the reiterations of Vitruvian

5 Aristotle, The "Art" of Rhetoric, Translation by John Henry Freese, The Loeb Classical Library 193, (William Heinemann LTD: London, Harvard University Press: Cambridge, Ma, reprint 1967), I.I.14.
6 I believe that Francesco's drawings also bear notions of pathos, or emotional appeal, specifically in depicting the human bodies in relation to architecture as discussed in chapter four. Also his drawings are dominated by a sense of logos, as they demonstrate a series of "reasoning" tied to the construction practices of his time.
7 Filarete, On Architecture, 121. The Allegory of Will and Reason is depicted in Fig. A, fol.69v.

thoughts, or a combination of all these elements. The drawings are also linked to the present, since they pertain to the *ingegno* and *inventio* of the architect at the time the drawings were made. They further project into the future by engaging one's *inventio* and *fantasia*; through the medium of drawing the architect engages readers in a dialogue by providing for a compendium of *fabrica* (practice) and *raciocinazio* (theory).

For Francesco, drawing is not merely an end, nor is it a means: it has ethical implications. Both vehicle and vessel, it is resonant with that drawing described by Pliny and identified above as being simultaneously about presence and absence. Francesco's drawings mediate between ideas and buildings; they capture the abstract ideas of the mind and anticipate form; they use the resources of history, design, geometry, arithmetic, and the human body and thus articulate and engender architecture, without ever undermining the gap that exists between the idea and the built form. As expressed in the title of the present dissertation, the insistence upon the 'embodied imagination' in Francesco's work identifies drawing, through the words and lines of the *Trattati*, as a critical and essential act for the architect. In Francesco's eyes, drawing intuits and guides the coming about, the development, and ultimately the maturation of ideas.

Similarly, they mediate between different times. Like the invisible forces that are applied to Francesco's machines and not unlike the role of time implied in Pliny's tale of the portrait, the element of time acts on and enriches his drawings. Time transforms drawing from a tool, effective in a process, to an active agent that possesses authority and credibility with regard to theory. Francesco's drawings and words not only "revive" the sayings of antiquity, but also seize an extended life by offering a guideline for the future through the interweaving of his own theory. The dynamic nature of time embedded within the architectural drawings of Francesco – but also in a broader sense in any drawing – supplies its essential strength and brings it closer to our age and understanding. His drawings bind the present to the past, and to the future. While much more could be said in this regard, my aim is to suggest that the imbrication of the different capacities of drawing, and the drawing-text relationship, outlined in this dissertation characterize Francesco's understanding of theory, in particular its rhetorical aspect. According to this understanding the ethics of the architect and the visual power of his work are inseparable, as are his individual vision and its historical positioning, as are his writing and drawing.

Consistent with this, it can be asserted that an alternative to the shortcomings of much contemporary representation could grow from recognizing these facts and that, in Vitruvius's words, one simultaneously needs both theory and practice. It would be meaningful to invest in a stronger

emphasis on "theory" to be employed by the adepts of digital media; as such, a theory that would be descriptive and prescriptive, ethical, historically rooted and cognizant of temporality. Francesco's *ethos* can be a model for this. It implies knowing that one would not be able to dictate what is to be done, yet can anticipate what is critical, and therefore invest in demonstrating potentials and possibilities. Francesco's work thus becomes meaningful for our own dilemmas, as we have seen that for him the act of drawing a man dictates notions of measure, proportion, symmetry, and harmony, and indicates a process that can foresee and provide for the needs of human beings. It would be unfortunate to use all the advantages, potential, and endless possibilities of digital media only to satiate our sense of sight in the most superficial way. Francesco reminds us that we should indeed please and respond to the need of our intellect's eyes as well. If we want to come to terms with our situation today, we cannot escape by infinitely throwing ourselves into an "image-production mode".

I hope my study has shown the relevance of drawing in connecting one's understanding and abilities to his ideas, through examining Francesco's investigation and application in that realm. My hope is that the dissertation has shaped a particular vantage point through which Francesco's written oeuvre can be understood not as fragmented elements, but as a relatively cohesive – though at times contradictory – effort to make sense of the architect's understanding of the world through his drawings. The secret aim of the project has been to demonstrate that beyond a mere populating of the pages of his theory, Francesco succeeded at testing – for himself – and making tangible – for his readers – his theoretical standpoints. Architecture, human life, inhabitation, and imagination coalesce uniquely in Francesco's drawings. They reach out and capture the imagination of the reader and create vivid images, which in turn enfold notions of time and space. Through a study of Francesco's work we are touched, moved, and transformed as we inhabit the space of drawing and enter into the architect's ideas and thoughts. This undertaking should help us assay our own attitude towards the act of drawing, in the face of a major transformation of what still defines our essential medium of conception, communication and execution of architectural thought.

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Note: For the drawings that are selected from the *Trattati*, the titles are taken from the Italian publication, edited and annotated by Corrado Maltese. The translations from Italian to English are mine. For all other sources, the titles and specific information belong to the source from which the image has been taken as well.

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