

Building Codes in the Architectural Treatise *de re Aedificatoria*

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ABSTRACT: Building codes in architectural treatises are seldom a source for construction history. The title of *The Ten Books of Architecture*, written by Leon Battista Alberti (1404-1472), keeps changing from *architecture* to the *art of building*. There is a debate on whether Alberti wrote for engineers or for architects. Most authors neglect professional competition in the Renaissance among artists, patrons, architects, engineers and builders. The architect Giorgio Vasari did not mention Alberti's architectural theory even Alberti is quoted afterwards in many other treatises. In this paper I will present two original documents: a Latin manuscript *De architectura* at The University of Chicago and an Italian MS *Architettura* at *Bibliothèque Nationale de France* in Paris. Evidence drawn from both texts will show that building codes and design principles are indeed construction history.

INTRODUCTION

Building codes in architectural treatises are useful for construction history. *De re aedificatoria*, paradoxically again has been translated as the "art of building." It was written before 1452 by Leon Battista Alberti (1404-1472). Anthony Grafton argues that Alberti was not an architect but a master builder (Grafton 2000; Payne 2003). Recent French and English editions emphasize construction rather than architecture in general. On the other hand, Wittkower in *Architectural Principles in the Ages of Humanism* systematically inquired into Alberti's building laws of mensuration, ratio, and harmonic proportion. He used Max Theuer's 1912 German translation *Leon Battista Alberti, Zehn Bücher über die Baukunst* which has the word "art of building" in the title.; he looked into treatise for design theory and not only construction. Likewise Paul Frankl and Leo Ettliger used Alberti's building laws of the organic analogy. Frankl wrote: "The organism of the building has a skeleton, skin, and musculature [...] spatial division, the components of spatial form, no longer complete isolated addends, but fractions of a pre-existent whole." Even today's practioners add that Alberti intentionally wrote as an architect but advanced competition, zoning regulations and environmental, control systems used today by engineers, "classical inspiration encouraged architects to create special zones for summer and winter use." (Howard 2001, pp. 127-135; Eden 1943, pp.10-28). Patronage clients such as *Federigo di Montefeltro* favoured engineers. Another patron such as *Piero dei Medici* did not need either architects or engineers; he acted as building contractor himself and supervised works executed in construction sites. Grafton therefore overlooked at Alberti's competitiveness as a humanist aware of public commissions such as St.Peter's basilica. Patrons such as *Federigo di Montefeltro* bestowed some rather generous flattery upon the engineer *Luciano Laurana*. As D.S. Chambers noticed, a fruitless search for architects in Tuscany sounds improbable at a time when Alberti, Michelozzo, Bernardo Rossellino, Francesco di Giorgio, Filarete and other architects were flourishing. In a patent letter written the 10th of June 1468 on behalf of *Luciano Laurana*, published and translated by Chambers, the patron *Federigo di Montefeltro* says,

We have searched everywhere, but principally in Tuscany, the fountain of architects, without finding anyone with real understanding and experience of the mystery. Recently, having first heard by report and then

by personal experience seen and known how Master Luciano, the subject of this letter, is gifted and learned in this art, and having decided to make in our city of Urbino a beautiful residence worthy of the rank and fame of our ancestors and our own stature, we have chosen and deputed the said Master Laurana to be engineer and overseer of all the master workmen employed in the said work, such as builders, carpenters, smiths and any other person of whatsoever degree, engaged in any kind of work in the said enterprise. (Chambers 1970, p. 167)

It is necessary to go quickly over the historiography of the sentences such as "art of building," "Baukunst," "artistic principles," and "künstlerischen Grundsätzen." George R. Collins and Christiana Crasemann translated Camillo Sitte's *Der Städtebau nach seinen künstlerischen Grundsätzen* (1889) as *City planning according to Artistic Principles*. They did not mean literally construction but rather Sitte's philosophy for urban design and town planning. (Collins et al. 1965, p.1). A literal translation of *Städtebau* as construction of the city would have made the reader to think that Sitte was talking about actual building activities rather than reviving Alberti's codes. The 1966 Italian translation by Giovanni Orlandi and Paolo Portoghesi was reprinted in 1989 and still keeps the word architecture in the title *Leon Battista Alberti, L'architettura*. I will argue that controversy is related not only to translation but also to interpretation. Evidence will show how Alberti gathered building codes through literary and empirical sources which aimed at architectural education.

An Architectural Treatise for Construction History

Since he was a humanist he used Greek and Latin references from on various fields of knowledge; also from his own practical experience. He visited construction sites such as *St. Peter's* basilica in Rome. By gathering laws of the Roman building permit, for example, he updated an architectural profession at the fringes of medievalism. Alberti's treatise on architecture was the first printed book on the theory of architecture (Foster et al. 1999). Howard Burns observes, "Alberti engaged in architecture neither as a trade, nor even as a profession, should not be mislead one into thinking that he was an amateur or a dilettante." (Burns 1979, p. 142). In 1452 Alberti gave a copy of his treatise to Pope Nicholas V because the pope was rebuilding Rome. Right at the beginning of his treatise, there is a paragraph where he describes a serious construction problem at the basilica of *St. Peter's* in Rome; right at end, he gives a design solution and recommends a set of rules to be used in other construction sites. Alberti writes,

Either to make a wall too thin or too thick, higher or lower than the rule of proportion requires taking notice of some errors in buildings that we ourselves may be the most circumspect, in as much as the chief praise is to be exempting from blame. I have observed therefore in *St. Peter's* church in Rome what indeed the thing itself demonstrates, that it was ill advised to draw a very long and thick wall over so many frequent and continued apertures, without strengthening it with any curve lines or any fortification whatsoever. And what more deserves our notice, all this wing of walls, under which are too frequent and continued apertures, and which is raised to a great height, is exposed as a butt to the impetuous blasts of the North-East. By which means already through the continual violence of the winds it is served from its direction above two yards: and I doubt not that in a short time, some little accidental shock will throw it down into ruins; and if not kept in by the timber frame of the roof, it must infallibly have fallen down before now. (Leoni 1755, I, 1) [...]. In the great basilica of *St. Peter* at Rome, some parts of the wall which were over the columns being swerved from their uprights, so as to threaten even the fall of the whole roof, I contrived how the defect might be remedied as follows. Every one of those parts of the wall which had given way, let it rest upon what column it would, I determined should be taken clear out, and made good again with square stone, which should be worked true to its perpendicular, only leaving in the old wall strong catches of stones to unite the additional work to the former. Lastly, I would have supported the beam under which those uneven parts of the wall were to be taken out, by means of engines called *Capra's*, erected upon the roof, setting the feet of those engines upon the strongest parts of the roof and of the wall. This I would have done at different times over several columns where these defects appear. (Leoni 1755, X, 17).

A Latin Manuscript of the Berlin Collection at the University of Chicago

In this paper I will present two original documents: *De architectura*, MS Arch#1 of the Berlin Collection at the University of Chicago (Fig. 1) and *Architectura*, MS Italien 970 at Bibliothèque Nationale de France in Paris. See in Fig. 2 some drawings of the Paris MS. When I have compared different printed editions and MSS, there hardly ever any illustrations. Notice that in the Paris MS there are detail drawings and construction specifications. I will mainly focus on the unpublished *Architectura*, which was probably written in Naples and, was acquired by the Library of the University of Chicago between 1889-1891 in the Berlin purchase to the book dealer S. Calvary & Co. *Buchhandlung and Antiquariat* of Berlin. It is bound in brown leather with gold tooled spine. Title lacks on spine or in MS. Italic hands written by a number of scribes. Large blue initials supplied at ff. 1, revs, but lacking elsewhere. They were intended to mark the beginning of each section, but after the introduction and Book I, the initials have not been painted in. Instead, space has been allowed for them and a tiny letter written in to indicate to the illuminator what he is to complete. It has two hundred eighty-two leaves, 30x21 cm. and long 25-41 lines per page, varying with individual scribes and even within the writing of one scribe. On the inside front flyleaf, someone, mistaking the contents of the volume, has written "Vitruvius," but "Alberti" has been written over it. The contents of the MS are as follows. Introduction, ff.1-4r, inc: "multas et varias artes;" expl: "nam primi quidem libri titulus." Book I, ff4v-28r, inc.: "de lineamentis aedificiorum;" expl.: "Sed prius de

materia et rebus his quae parasse ad opus oportet." Book II, ff28r-53v, inc.: "opus aedificiorum atque impensam;" expl.: "de his hactenus." Book III, ff53v-82v, inc.: "omnis astruendi operis ratio;" expl.: "emendandis atque instaurandis transigemus." Book IV, ff82v-104v, inc.: "edificia [...] esse [...] constituta;" expl.: "de his igitur suo dicetur loco." Book V, ff104v-138r, inc.: "operum varietates cum intra urbem;" expl.: "tardius countervescit(?)." Book VI, ff138v-162v, inc.: "lineamenta et materiam operum;" expl.: "ad pristorum delicias merifice con [...]." Book VII, ff162v-194v, inc.: "rem aedificatoriam constare partibus;" exp.: "profanis edificationibus demandandas statuo." Book VIII, ff194v-218r, inc.: "ornamenta que operibus adhibeantur;" expl.: "pedes plus centenos decies centies." Book IX, ff218r-243r, inc.: "meminisse oportet privatorum edificiorum;" expl.: "favete his studiis litterarii (?)." Book X, ff243r-281v, inc.: "fide operum vitiis emendandis;" expl.: "Ut digniores multoque elegantiores habeantur. Deo gratias. Tepos. The first print of *De re aedificatoria* appeared in Florence in 1485. Leon Battista probably wrote some chapters in the early 1420s, while he was writing a short treatise on mathematics (*Ludi Matematici*). Some other chapters might have been written in the early 1430s while he was editing, with the help of his relatives in Sicily his book *On the Family*. At that time Sicily and Naples were ruled by King Alfons of the Catalan-Aragonese, Mediterranean confederation; the Alberti had business in his court. In 1370 his grandfather *Petro Alberti* was in the government of Sardinia, another island of the Catalan-Aragonese confederation. We read,

Nos Petrus, Dei gratia rex Aragonum, Valenciae, Maioricarum, Sardinie, et Corsicae, comesq' Barchinonae, Rossilionis et Ceritaniae. Circa melioramentum villae nostrae Alguerij intendentes libenter, tenore presententes cartae nostrae perpetuo valiture ipsi villae quae considerato valore suo arctum territorium concedimus speciale, quod villa de Siurana, Derguilo, et De Sella situate in terra Nuve dictaeque villae Alguerij satis contigue, quas quidem villas dederamus Petro Alberti quodam militi gubernatoris Lugudorij, per cuius obitum ipsae villae sunt ad nostrum patrimonium devolutae, earumdemque villarum termini [...] redditusque[...] vicariae eiusdem villae Alguerij de caetero perpetuo assignati (Document CXXXIX in Pasquale Tola, *Codice Diplomatico della Sardegna*, tomo I, parte seconda, Sassari, 1985, p.811).

The young Leon Battista, therefore, learned from his own family how building codes worked in the late fourteenth-century. New-town, planning policy was implemented in Sardinia through the rights his family had in collecting taxes in Sardinia and somewhere else. Another relative *Tomasso degli Alberti* was an attorney in Sicily and held the office of the vice chancellor of the king of Naples; his nephew *Alberto degli Alberti* taught at the University of Bologna while the young *Leon Battista* was studying law there. *Alberti's* cousin, *Bernardo degli Alberti*, published the *editio princeps* of the treatise in 1485 probably after a copy of the Chicago MS.

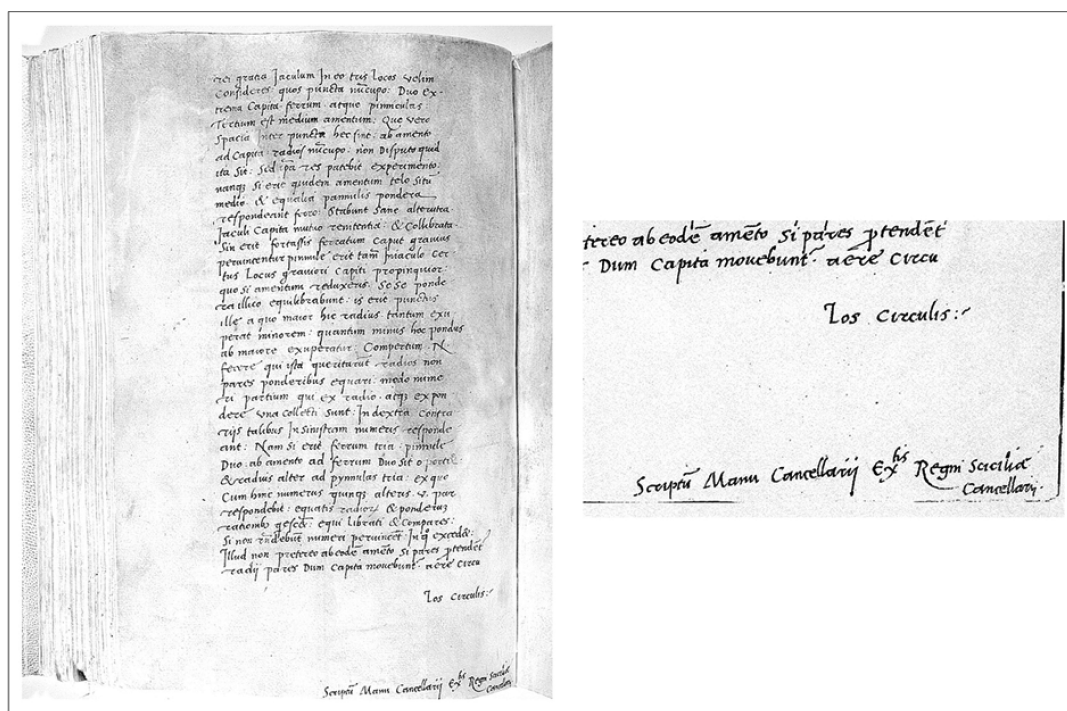


Figure 1: Chicago MS Arch Box No.1

At the bottom of f. 150 v there is a colophon written apparently by the scribe of that gathering: *scriptum manu Cancellarii Extis. regni Siciliae (sic) cancellarii (sic)*. Diane White has suggested that the Chicago MS was written either in a Sicilian canter or in some other place where a royal scribe might naturally find himself. If not in Sicily, then Naples is perhaps the likeliest spot. After the death of King Alfons in 1458, the confederation of Aragon, Sicily and Naples was divided; and Ferran, the son of Alfons, ruled Naples, while Alfons' brother Joan succeeded to the kingdom of Aragon and Sicily. There are also references the treatise was written in the con-

federation in a letter dated February 7, 1483 written by cardinal Joan d'Aragon to the Florentine Francesco Gaddi. He was in Naples on a prolonged business in a period when relations between the Medici and the king of Naples were particularly cordial. (*Tammaro de Marinis' Biblioteca Napoletana de Re d'Aragona*, vol.I, p.88). Building codes found in the Latin edition of Hans-Karl Lücke (1976) are very similarly stated as in Leoni's 1755 English translation reprinted in 1986 (Saura 2000). In turn the Chicago manuscript is very similar to the composition of Max Theuer's 1912 German translation. In a letter of August 23rd, 1891 written by Verlag von S. Calvary & Co. to William Rainey Harper, President of the University of Chicago, there is an inventory where the treatise is listed with other 200 manuscripts, 230.000 books and many antiquities. The letter describes the treatise as an original manuscript of Leo Alberti's *Architectura*. The treatise travelled from the Catalan-Aragonese court of Naples to Rome, from there to Basel and from Basel to Berlin probably through Munich. Michael Martinus Stella was a Renaissance scribe and printer, based primarily in Basel. From 1549 to 1552 he was in Rome copying manuscripts and may have brought the Catalan-Aragonese MS to Germany. Stella printed a variety of works, including some other works written by Alberti, sold some other manuscripts to the Fugger family, and eventually ended in Munich. Maybe the MS travelled to Germany through Paris. Some other Naples MSS of the Berlin Collection, e.g., Ovid's *Remedio d'amoris* used to belong to Cardinal Giannangelo Braschi (1717-1799). He became Pope Pius VI in 1775, and died as Napoleon's prisoner. In the 1760s Braschi bought some books to Marquis de Taccone of Naples, who was treasurer to the Kingdom of Naples late in the eighteenth century. (Edgar J. Goddspeed, *A Catalogue of Manuscripts in the University of Chicago Libraries*, Chicago, 1912). White already pointed out the need to compare the Chicago MS with the *editio princeps* and other editions. (White 1969).

Building Codes for Architectural Education

Alberti wanted architecture to be taught at a higher ranking. The word art of building does not mean today the same thing it meant in Alberti's own time. The word art also meant guild as well as a set of subject matters that were taught in school. The teachings of mathematics and physics, for example, were part of humanist education which in turn was based on the liberal arts. Erwin Panofsky already pointed to the fact that for measuring the proportions of the architectural orders, Alberti used the word *exampeda* rather than the medieval *testeor visi*. Alberti clearly stated in the preface his purpose at teaching architectural design methodology. He writes,

What he is that I allow being an architect: for he is not a carpenter or a joiner that I thus rank with the greatest matters in other sciences, the manual operator being no more than an instrument to the architect. Him I call an architect, who, by sure and wonderful art and method, is able, both with thought and invention, to devise, and with execution, to complete all those works, which, by means of the movement of great weights, and the conjunction and amassment of bodies, can, with the greatest beauty, be adapted to mankind [...] And what potent or wise prince can be named, that among his chiefs projects for eternizing his name and posterity, did not make use of architecture. The conclusion is that for the service, security, honour and ornament of the public, we are exceedingly obliged to the architect; to whom in time of leisure; we are indebted for tranquillity, pleasure and health; in time of business for assistance and profit; [...] We consider that an edifice is a kind of body consisting, like all other bodies, of design and matter. The first is produced by the thought, the other by nature. The one is to be provided by the application and contrivance of the mind and the other by preparation and choice. And we further reflected that neither the one nor the other of itself was sufficient, without the hand of an experienced artificer that knew how to form his materials after a just design. (Leoni 1755, preface) In sort, Alberti's purpose was to use the law for teaching architecture, urban design and town planning.

A Problem of Translation

The title of Alberti's treatise keeps changing all the time. Most recent French and English editions emphasize construction. In 1988 *Ten Books of Architecture* reprint of Leoni's English translation of 1755 changed to *Leon Battista Alberti, On the Art of Building in Ten Books* edited by Joseph Rykwert, Neal Leach and Robert Tavernor. In 2004 the title of Pierre Caye's and Françoise Choay's edition *L'art d'édifier* changed Jean Martin's original *L'architecture et l'art de bien bâtir* of 1553. If one drops Alberti's architectural scope stated in the preface, it is easier to sustain an interpretation of an Alberti as a master builder. The problem is that the words Alberti used to describe building codes have been translated differently from Latin: the *ratione concinnitas* of the Chicago manuscript appears in other editions transcribed and translated as follows: *congruity or harmony of all parts fitted together with proportion*, Leoni, 1755; *bestimmte gesetzmäßige*, Theuer 1912; and *l'harmonie réglée*. In the Naples manuscript the treatise is named *Architectura*. The word architecture still appears as *Libros de architectura* in other two Latin texts, the Vatican codex *Urbinate Latino 264* and the codex *Laurenziano, Plut.89as*. Lücke found in Alberti's text of the *editio princeps* (Florence, 1485) three lexical categories. Firstly, there are legal terms which were out of use in the Middle Ages but were revived by Alberti from Classic literary sources; he matched contemporary practice with classical theory. Secondly, there are terms actually used in Alberti's own times but some of which Alberti changed their original meaning in order to illustrate his theories of architecture and town planning. Lastly, there are terms which Grayson also agrees with Lücke that were either invented or copied directly from Greek texts. I have also found this taxonomy in both manuscripts of Naples and Paris (Saura 2000; Caye and Choay 2004; Tauber 2005).

Roman Building Law Revived by Alberti

Alberti was a humanist and an architect but also a lawyer. As a graduate student in law at the University of Bologna, he learned not only Roman law but also late-medieval, building regulations of cities which he either used to live with his family or had visited as an adult. *Girolamo Mancini* writes, Battista nel maggio el 1421 gia frequentava le lezioni di diritto canonico [...]legge a Bologna, ne fosse casuale la scelta della città. Forse vi insegnava messer Antonio Alberti, e fin dal 1421 vi demorava come questore pontificio Alberto Alberti (Mancini 1911; Borsi 2006). Roman law was revived in Bologna from the eleventh to twelfth centuries with *Irnerius* (1060-1125), *Gratian* (1140) and *Accursius* (1250). By the end of the thirteenth century most city states, such as Siena, had already implemented the Roman laws of the building permit into their vernacular, custom building codes (Braunfels 1979). Alberti knew them by heart and enhanced them through *Vitruvius*. The humanist *Poggio Bracciolini* discovered a codex of *Vitruvius* architectural treatise *De Architectura* in the monastery of *Saint Gall* in 1416. Alberti took from *Vitruvius* theory today's design constraints. For example, in the countryside the designer has greater freedom than in town for deciding the height and ornament of buildings. He writes, The ornaments, for that in town ought to be much graver than those for a house in the country, where all the gayest and most licentious embellishments are allowable. There is another difference too between them, which is, that in town you are obliged to moderate yourselves in several respects according to the privileges of your neighbour; whereas you have much more liberty in the country. In town you must not rise your platform or basement too high above your neighbours, not let your portico project too far forwards from the line of the adjacent buildings. The thickness and height of the walls at Rome anciently were not suffered to be according to every man's particular fancy, but by an old law all were to be made according to a certain standard; and Jules Caesar, upon account of the mischief that might happen from bad foundations, ordained that no house should be more than one story high [...] It was reckoned one of the glories of Babylon, that their houses had inhabitants in the fourth story. (Leoni 1755, X, 2)

Roman building laws are not even today a favoured subject of investigation. But Alberti's terms are correct when one compares today's scholarship on Roman law. The major work in this area is still by *Moritz Voigt* *Die römischen Baugesetze*. (Rykwert 1976, pp. 29-136; Kostof 1991, p.16). Regulations for building near public spaces surrounding a town or a village, the *pomerium*, are found in *James Oliver*. In *The Augustan Pomerium* he argued unconvincingly that this kind of law defined not only city limits but also determined the form of urban growth. The whole controversy was taken again by *Rykwert* in *The Idea of Town* (1976) where he described foundation rites more than actual building. *Spiro Kostof* in *The City Shaped. Urban Patterns and Meanings Through History* (1991) found that *Rykwert's* use of symbolic, urban forms should not necessarily entail that seeking any rational or pragmatic logic for ancient cities was futile. *Kostof* insisted that even in the alleged cosmic city there can be found practical, technological, economic, sanitary – and obviously legal -- explanations for the placement and layout of cities. On the *pomerium* type of building laws to protect the public use of open space around towns *Alberti* writes, “[It is] a very handsome open space left both within and without the walls, and dedicated to the public liberty; which should not be cumbered up by any person whatsoever, either with trench, wall, hedge or shrub, under very great penalties.” (Leoni 1755, VII, 2). On other building codes of Rome under *Augustus*, the classical general surveys remain still those of *Theodore Mommsen*, *Römisches Staatsrecht* (1887); and *Homo's Rome Impériales*, parts 2 and 3 and *D.E. Strong* who studied the job of public officers, aediles, surveyors and censors for Rome's built environment. (Suolahti 1963). Officers such as the road and public works curators were explored by *Phyllis Ertman* (1976), *Curatores Viarum: A Study of the Superintendents of Highways in Ancient Rome* and *L. Cantarelli* *La Serie dei curatores operum publicorum* (1894). Currently *Josep Closa* of the *Classics Department of the University of Barcelona* is involved in original research on the treatise of *Frontinus*, *De Aquae Ductu Urbis Romae* and on responsibilities of water supply officers in general. Some hydraulics engineering knowledge prevailed during the Middle Ages, as well as the laws of street magistrate's *maestri di strada*. In *Alberti's* treatise the term master builder, *magister*, carry the tasks required in antiquity to *magistratura* officers. In short, in his treatise building codes range from very different levels of analysis, from granting building licenses to ruling construction details, even by quoting Greek philosophy, as follows “To fit such stones together is by means of the Doric rule; which like *Aristotle* used to say, laws ought to be made.” (Leoni 1755, VII, 2)

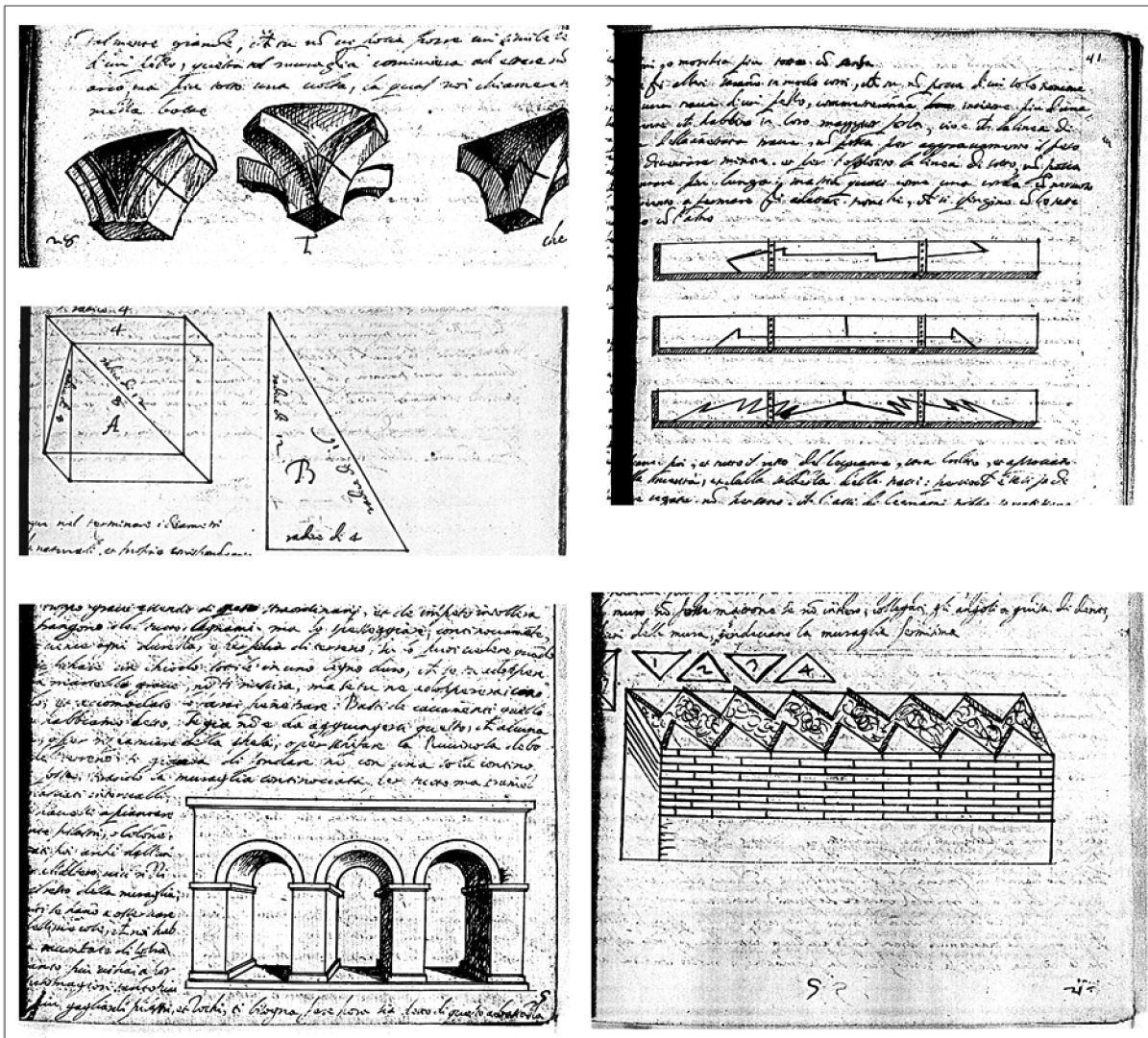


Figure 2: Bibliothèque Nationale de France, Paris (BN): Architectura, MS, sixteenth century, Italien 970.

Building Codes and the Revival of Congruity Theory (*Concinnitas*)

According to Cicero a piece of literature or a speech should be composed as a body, as a natural organism by graciously placing parts within a balanced whole. Architectural design is a process ruled by design principles similarly to objects made in nature. They grow by following laws of regularity. The mental construct of *concinnitas* was one of Alberti's most important set of rules for designing which were translated as laws of congruity by James Leoni in 1755. In his German edition Theuer translated the term in 1912 as follows: "[...]doch der kurze halber möchte ich die Definition geben, das die Schönheit eine bestimmte gesetzmäßige Übereinkunft aller Teile, was immer für einer Sache, sei, die darin besteht, das man weder etwas hinzufügen noch hinwegnehmen oder verändern könnte, ohne sie weniger gefällig zu machen." It is much closer to Alberti's original title than that of the mentioned French and English translations: "cependant, pour être bref, nous en donnerons les définitions suivantes: la beauté est l'harmonie, réglée, par une proportion déterminée, qui règne entre l'ensemble des parties du tout auquel elles appartiennent, à telle enseigne que rien ne puisse être ajouté, retranché ou changé sans le rendre moins digne d'approbation." In the Chicago MS e read, "nos tamen brevitatis gratia sic diffiniemus: ut sit pulchritudo quidem certa cum *ratione concinnitas* universarum partium in eo, cuius sint, ita ut addi aut diminui aut immutari possit nihil, quin improbabilius reddatur." And in the *editio princeps* published by Lücke, "nos tamen brevitatis gratia sic diffiniemus: ut sit pulchritudo quidem certa cum *ratione concinnitas* universam partium in eo cuius sint: ita ut addi / aut diminui / aut immutari possit nihil / quin improbabilius reddat." (Lücke 1975). The congruity set of laws prevail all over the treatise. At the end Alberti still reminds the reader that architectural design is a rule- bounded activity. Alberti writes,

Hinc fit ut, cum seu visu sive auditu seu quavis ratione admoveantur ad animum, *concinna* confestim sentiantur. Natura enim optima concupiscimus et optimis cum voluptate adheremus. Neque in toto corpore aut partibus viget *magis concinnitas* quam in se ipsa atque natura; ut eam quidem esse animi rationisque consortem interprete [...] Quicquid enim in medium proferat natura, id omne ex *concinnitatis* lege

moderatur. Neque studium est maius ullum naturae, quam ut quae *produxerit*, absolute perfecta sint. (Chicago MS, IX, 5)

And we read in the eighteenth century English translation,

So that whenever such a composition offers itself to the mind, either by the conveyance of the sight, hearing, or any of the other senses, we immediately perceive this *congruity*: for by nature we desire things perfect, and adhere to them with pleasure when they are offered to us; nor does this *congruity* arise so much from the body in which it is found, or any of its members, as from itself, and from nature, so that its true seat is in the mind and in reason (Leoni 1955, X, 5)

In the Early Renaissance when humanists in general revived the Greek organic analogy. Arguments rose among humanists on whether *Plato* was more relevant than *Aristotle*, or vice versa, for understanding the world. Nevertheless, *Aristotle's Poetics* became more influential as *Oscar Kristeller* already pointed out. The debate is clearly represented in *Raphael's* fresco *The School of Athens in the Stanza della Segnatura* at the Vatican. For *Alberti* this was not a problem since laws of congruity, *concinnitas*, meant the same for both Greek philosophers. *Plato* wrote, "You will allow that every discourse ought to be constructed like a living organism, having its own body and head and feet. It must have middle and extremities which are framed in a manner agreeable to one another and to its unity." (*Phaedrus*, 264c). And *Aristotle* wrote, "The parts which constitute it must be inwardly connected, arranged in a certain order, structurally related and combined into a system. A whole is not a mere mass or sum of external parts which may be transposed at will, any one of which may be omitted without perceptibly affecting the rest." (*Poetics*, VII, 4). The revival of congruity theory helped *Alberti* to write on urban life and for granting building licenses. In Roman law the codes of the building permit (*operis novi nuntiatio*) belong to a broader set of land ownership rights and the treatise is classified in building in both private and public property. (Paricio 1972). Throughout the two original manuscripts of the treatise which I am studying in Chicago and Paris, I have observed that he uses (besides the *operis novi nuntiatio* of the building permit) the following legal terms: *lex, licere, ratione, providere, statuere, lumen, praecepta, norma, ius, mos, consuetudo* and *vicinus*. (Saura 1989).

Alberti's Building Codes in Other Architectural Treatises

Since the sixteenth century architects have been reading *Alberti's* treatise for both theory and practice. In a French edition of *Alberti* printed in 1512, *G. Tory* said that in France *Vitruvius* was read for building and *Alberti* for theory (Saura 1989, p.343). *Alberti* is quoted in: *F. Colonna's Hypnerotomachia Poliphili*, (Venice, 1407-1490); *Philibert de l'Orme's Le premier tome d'architecture*, (Paris, 1568); *F. Milizia's Lives of Celebrated Architects, Ancient and Modern*, (London, 1826); *William Chambers' Treatise on Civil Architecture*, (London, 1723-1796 and 2^{on} edition of 1825); *Q. de Quincy's Architecture*, (1788-1825). *Ph. de l'Orme* emphasized *Alberti's* distinction between, on the one hand rules of proportions of the classic orders and, on the other, building regulations required in construction sites. In the 1673 and 1683 *Claude Perrault* wrote in *Ordonnance d'architecture de Vitruvius* a critical view towards architects who did not write on regular building codes but only on ornament of columns and rules of classical orders. Like *Alberti* he insisted on the social meaning of the law through either custom or usage; not for art's or law's sake. By using *Alberti's* organic analogy of architecture as living organisms, *Perrault* says,

L'ordonnance est ce qui règle la grandeur de toutes les parties d'un bâtiment par rapport à leur usage. Or on entend par les parties d'un bâtiment, non seulement les pièces dont il est composé, telles que sont une cour, un vestibule, une salle; mais aussi celles qui entrent dans la construction de chacune pièce. [...] Il faut être instruit par une longue habitude des règles quel seul usage a établis, et dont le bon sens ne saurait suggérer la connaissance: ainsi que dans des Lois Civiles il y a un qui dépendent de la volonté des législateurs et du consentement des peuples que la lumière naturelle de l'équité ne découvre point. [...] Par l'accoutumance, qui a le pouvoir de faire ceux qui l'on dit avoir le goût de l'architecture.

In 1781 *Francesco Milizia* and similarly *William Chambers* in the late eighteenth century, followed *Alberti's* laws of congruity. *Milizia* reminds the reader the significance of classical sources of *concinnitas* when he compares a cottage to a speech act and architecture to rhetoric. *Milizia* writes, "Importa bensì il vedere, se dal mistico esemplare della capanna si possa dedurre un buon sistema de regole e imitazione per la bellezza de l'architettura [...] La capanna é a l'architettura come quello che il parlare é all'eloquenza." Similarly *Chambers* writes, "The duty of the architect is to invent and dispose all that enters into the design [...] and all parts be calculated, to produce a general uniformly supported whole [...] Without knowledge of the rules to guide or judgment to restraint, little more can be expected than capricious conceit." In 1788 *P. Bullet* published *Architecture pratique avec une explication de 27 articles de la coutume de Paris, sur le titre des servitudes and rapports qui concernent les batiments*. In short, while some treatises such as *Colonna's* aimed at utopia others such as *Bullet's* were grounded in very practical issues of the building permit.

CONCLUSION

De re aedificatoria is also construction history. The humanist *Alberti* was not a master builder of the Italian Renaissance. For his building codes he drew empirical and literary references from Roman laws of the building permit, from city regulations and from his own experience in construction sites, e.g., in *St. Peter's* church in

Rome. Problems of translation and interpretation are related to the way the word *architecture* in the title is replaced by *the art of building*. Some authors did not look up at Alberti's purpose and intention. His treatise was also addressed to patrons and supervisors, superintendents, entrepreneur-developers, surveyors, keepers of the works or of the fabric, clerks, directors, devisors, and so on. To everybody involved in implementing building laws in actual construction. There still remains a perplexing question for future multidisciplinary, environmental legislation studies. As in the Urbino case, the architect himself was ruled and often checked by experts called in from outside, who examined and reported on "the job," a practice that horrifies us today, but which acted as a safeguard from the "client's" point of view, and could only be objected to by incompetent practitioners.

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Acknowledgements

Thanks to Alice Schreyer, director of the Special Collections Research Center at the University of Chicago and to Josep M. Sans, director of the Arxiu Nacional de Catalunya, Barcelona.