

The Establishment and Spread of the Architectural Vocabulary in Renaissance Spain: Diego de Sagredo's *Medidas del Romano* (1526)

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ABSTRACT: The Modern Ages treatises are one of the most relevant sources for the knowledge of the architectural techniques, models and thoughts that have governed the European Architecture between XVIth and XVIIIth centuries. One of the main problems when researches have to interpret the contents of these treatises is the right comprehension of the concepts that their authors tried to pass on, modified by the time. This paper presents a new methodology for terminological and conceptual research that allows a deeper and systematic understanding of the real meaning of the terms used in these texts and determines its establishment, evolution and spread of some ideas that conditioned the European art of building in those centuries.

In this paper we present some results of the Research Project: "*Tesaurus Terminológico – Conceptual de los discursos teórico-artísticos de la Edad Moderna española (TTC), complementado con un corpus textual informatizado (ATENEA)*" [HUM05-00539], coordinated by Dr. Nuria Rodríguez Ortega, professor of the University of Málaga (Spain) and supported by the Spanish Ministerio de Ciencia e Innovación (Science and Innovation Office). This project's aim is to expand, develop, and consolidate the model of digital and web consulting glossary that constitutes what we call *Tesaurus Terminológico-Conceptual* a kind of thesaurus specifically designed to help artistic investigation in the field of aesthetics, theory, and critic or their conceptual or epistemological derivations (Rodríguez Ortega, N.: 2008, pp. 1659-1675).

In this Project we are developing an Electronic tool for Text Analysis with the computer providing a corpus of Modern Spanish Artistic and Architectural Treatises (ATENEA) and a Thesaurus of Terms and Concepts (TTC) that allows the researchers to find all the different meanings of one term in the different treatises who are part of the corpus. This tool will also favor a systematic methodology to establish influential relationships between the authors, the origin and development of the technical, theoretical and critical concepts or their uses between XVIth and XVIIIth century.

In this paper we provide an example of the preparation of the TTC of the treatise *Medidas del romano* (Diego de Sagredo, 1526) as well as a comparative study between the use of term *medida* in Sagredo's treatise and the first Spanish edition of Alberti's *De re aedificatoria*, (Lozano, F., 1582).

METHODOLOGY OF THE TTC

This research follows text analysis methodology by Dr. Nuria Rodríguez Ortega. To analyze the text with the computer we need to convert the treatise into Electronic Text by transcribing it into the computer. To prepare the TTC we have to find the outstanding words of the discourse for what a deep critical reading is needed. This provides the first wide list of terms (in this example we had a list of 82 words). With the proposal of a deep study of outstanding concepts of the text we decided to start to analyze a list of the ten main words of the discourse. To reduce the original 82 term list into ten we have to search their turn up in the text by using a text analysis program like TAPoR. To make this process more effective we have to include all the orthographic varieties of the terms as well as its etymological root. The list of concurrences permits identifying the terminological typology of the treatise thanks to predominant vocabulary, if it is technical, theoretical or descriptive.

Once we have the list we have to study each term. First we delete those uses that have not got an artistic meaning and then we establish how many theoretical and critical concepts are associated to each word by analysing the term context. When we know the different meanings associated to the word we proceed with analyzing the concept: its meaning in the treatise (studying concordances with another terms), influences of other Spanish authors, foreign influences (specially from Italian writers) and use of Neologisms.

STUDY OF THE THEORETICAL VOCABULARY OF DIEGO DE SAGREDO

After applying this methodology to *Medidas del romano* we arrive this conclusion, which is that most words of the list of concurrences are technical terms: *columna* (210 concurrences), *moldura* (114 c.), *medida* (63 concurrences + 6 varieties: 4 infinitives: 'medir' + 2 participles 'medido'), *cornisa* (50 c.), *basa* (48 c.), *plinto* (48 c.), *capitel* (39 c.), *dórico* (37 c.), *forma* (30 concurrences. + 66 varieties: 56 'formación' + 10 'formado/a'), *jónico* (30 c.) and *tablero* (30 c.). The list accords with Bustamante and Marías who had described this treatise as a book about columns (Bustamante, Marías, F., 1986, p. 106) and like a 'pre-architectural' treatise because "se ocupa (...) de presentar exclusivamente instrucciones muy detalladas sobre elementos o 'piezas' formales (...)". (Bustamante, Marías, 1986, p. 9) *Medida* (measure) and *forma* (shape) are the only two theoretical terms in this list, whose use is not only reduced to their nominal forms but they are also used as verbs or adjectives. The theoretical orientation of this paper induced me to adapt the list of concurrences excluding technical terms and including aesthetical ones: *medida* (63 c. + 6 varieties: 4 infinitives + 2 participles), *forma* (30 c. + 66 varieties: 56 nouns *formación* + 10 adjectives *formado/a*), *proporción* (15 c. + 4 varieties: 1 *disproporción* + 3 *proporcionado*), *naturaleza/natura* (13 c.), *género* (9 c.), *regla* (8 c.), *orden* (8 c. + 14 varieties: 3 infinitives *ordenar* + 6 adjectives *ordenado/a* + 5 pasts *ordenaron*), *perfección* (6 c. + 3 adjectives *perfecto/a*), *romano* (6 c.) and *composición* (5 c. + 7 varieties: 2 infinitives *componer* + 5 adjectives *compuesto/a*). We observe that except *medida* and *forma*, which were already in the first list, Sagredo hardly ever uses theoretical terms. Nevertheless these words are very significant because they depict his theoretical thinking, which is influenced by his main sources: the Latin editions of Vitruvio's *De Architectura Libri X* and Alberti's *De re aedificatoria*. On preparing the list of concurrences of theoretical terms we realise how important the use of etymological roots in searching for concurrences is. The derivatives of terms offer us a deeper knowledge about how the author uses them, their concepts and their meanings on the discourse. A good example of this is the word *forma*: its concurrences grow up from 30 to 96 when we add the concurrences of terms such as *formación* and *formado*. Another effect of this action is clarifying a comparative search shading the use of two terms. For example: *invención* and *ingenio*, they both have five concurrences on the text however the first one *invención* reaches 9 concurrences when adding its derivatives, so it comes up more frequently than *ingenio*. There are no Neologisms or Italianisms in the list of concurrences but it does not mean that Sagredo had not been influenced by his Latin sources. During a critical lecture of the treatise we have found the word *venusto*, which is a clear derivation of *venustus*. The latter is a term used by Vitruvio to designate the concept of beauty. It is also interesting the lack of aesthetical references, even when Sagredo's intention was to pass on the keys for well building in what he called 'roman style'. These are some of immediate results about the nature of this treatise providing by the list of concurrences. A terminological and conceptual study is necessary to go in depth of the meaning of each term.

A COMPARATIVE STUDY OF THE MEANING OF MEDIDA: DIEGO DE SAGREDO'S TREATISE VS THE FIRST SPANISH EDITION OF ALBERTI'S DE RE AEDIFICATORIA

In this paper we also wanted to present an example of comparative study applied to theoretical terms. Our intention was to compare terminological and conceptual uses of theoretical terms in *Medidas del romano* with the first Spanish translations of main Italian treatises of Architecture published within the XVIth century (see the Conclusions of the present paper). We expected to establish the influence of Sagredo's treatise upon his contemporaries, but the length of this paper induced us to reduce our initial ambitious proposal. So we compare Sagredo's use of the term *medida* with the use that Francisco Lozano gives to this term in his translation of Alberti's *De re aedificatoria*, whose Spanish title is *Los diez libros de arquitectura* (1582). In terminological and conceptual studies of terms it is also very important to analyze their concordances with other words. It provides us a much more precise knowledge of the meaning of terms. However we will only enunciate concordances of *medida* in both treatises, just to let the reader know in which context both authors use the term.

THE CONCEPT OF MEDIDA

Medida is the main theoretical and critical term of the Sagredo's treatise, which is included in the title as cornerstone of his discourse. The term *medida* is used to designate the concept of module like a standard or unit for measuring architectural elements. Sagredo's *medida* is semantically taken from Vitruvio's *modus*. *Modus* is one of the elements that together with *simmetria*, *consensus membrorum*, *convenientia*, *compositio* and *proportio*, contribute to the beauty of the Architecture as Vitruvio understood it, like an agreement of parts. Even though the use of the term *modulo*, the Spanish equivalent of module was started to be used in Spain in the XVth century (Coromines, J., 1967, p. 374), Sagredo never includes it in his discourse. The Spanish word *módulo* comes from the Latin *modulus*, which is the diminutive of *modus*. In the same way, the verb *modular* (to modu-

late), which was also included in the Spanish vocabulary during the XVth century, comes from the Latin *modulari*, whose meaning is: to put something under a cadence or under regular intervals. The latin concept of *modulari* was intended to be rescued by Sagredo in the regard of his concept of roman Architecture. A new semantic value of the term *medida* is so given by Sagredo so it designates a modular dimension instead of simply a size. Alberti uses fewer times than Sagredo the term *medida* as modular dimension concept. This explains why we find only 22 concurrences of the term in Lozano's translation in comparison with the 63 concurrences in Sagredo's text. This has two causes: a) the nature and composition of Alberti's treatise and b) the different conception of architectural treatise. We have already mentioned that *Medidas del romano* is a book 'about columns' and according to Marías: "*un epitome de Vitruvio y Alberti*" (Marías, F., 2007, p. 115) dedicated to one constructive element. In *De re Aedificatoria* Alberti translates the Antiche Architecture into proportional rules but, in comparison with Sagredo, his vision is much more wide and deep. He does not limit the subjects to the shape and composition of columns but goes beyond by treating architectural elements, constructive materials, building processes (from how to choose the best place for building to how to build the walls, roofs, floors, etc.), urbanism, architectural typologies, decoration and restoration of works. Considering the diversity of matters that the book deals with, his standard for measures only appears in a few chapters, embedded in constructive or aesthetical subjects. Sagredo thinks his treatise like a 'recipe book' for master masons who would had been in need of his detailed descriptions and significant images for building in 'roman style'. Alberti wrote his treatise like a 'handbook' with the intention of given some basic advices for the composing of architectural monuments. Being vaguer in the details he gave more freedom to the architect to make up the building. That explains why, in many occasions, he refers to the abstract concept of measure as a basic condition for a well constructed monument, but does not specifies any arithmetic measures:

Pero la pared misma se levantará por las cuentas de las columnas, de suerte, que si ha de ser de tanta altura quanto es la columna con el capitel, tenga tanta grosseza quanto tienen la columna en lo bajo. De más de esto observaron también eso, que no vviessen columnas, o basa, o capitel, o pared, que por alguna parte no fuesse muy semejante a las demás de su orden en altura, anchura y finalmente en toda medida y figura, y como lo vno y lo otro sea vicio que la pared sea hecha delgada, gruesa, baja, y alta más de lo que la razón y modo requiere querría yo más que se peccasse en esta parte de que se pudiesse quitar, que no que convenga añadir (...) (Lozano, F., 1582, Book I, Ch. I, p. 25)

At the beginning of the text, Alberti proposes as module for the width of the wall that lays over de columns the width of the column in its bottom quarter. This is a very vague idea for module if we compare it with the indications of Sagredo and even with the arithmetic measures given by Alberti in chapters V and VI, of book IX of the same treatise. Sometimes Alberti is just not interested in emphasizing the concept of *medida*. Though some arithmetical measures are given he prefers to define proportional standards. For example:

(...) las columnas que hiziesen a la gentileza de la obra instituyeron las en esta manera, porque a los capiteles Doricos, dixeron que se les devían aquellas columnas, cuya grosseza suya de abajo tomada siete vezes sea igual al largo suyo, que es desde lo alto hasta lo bajo. A los Ionicos quisieron que la grosseza de abajo tuviesse la novena parte de su longitud. Pero en los capiteles Corinthios pusieron en bajo columna larga por ocho grossezas suyas. (Lozano, F., 1582, Lib. VII, cap. V, p. 202)

In the latter Lozano's translation of Alberti we observe one of Lozano's use of the term *medida* to designate the concept of module or modular dimension as Sagredo. It is also used when talking about the Ionic capital:

En el cuello unos fixaron rosas, otros toda la grosseza del capitel, será la mitad de la grosseza de abajo de la columna. Esta grosseza de capitel divídela en veynte y una medidas: darás pues a la cimaza tres medidas, alcarrón darás quatro, al botacio darás seys, y las otras seys de abajo déxalas para las volutas, las quales harás de una y otra parte el cartón pendiente. (...) El centro del caracol del lado derecho distará de la última línea de su cimaza suprema por doze medidas. Desta suerte tirarás el caracol, en el punto del medio del centro, pon un pequeño círculo cuyo semidiámetro tenga una medida, y en la parte contraria notarás también otro en bajo en la redondez más baja. (Lozano, F., 1582, Book. VII, Ch. VII, p. 206)

The main difference between both Spanish texts is that while Sagredo only uses the term *medida* Lozano also uses the term *módulo* (module) and so we read in the VIIth book, chapter IX:

Tomada la grosseza de esta architrave la dividieron en doze módulos o tamaños, con los quales módulos se miden todos los membrecillos que se siguen. A la primera faxa de abajo dieron quatro módulos: a la cercana a esta que está en medio dieros seys, a la más alta se le dexaron dos módulos, y de los seys módulos de la faxa de en medio, el un módulo más alto se dio a las reglas, y el otro a los clavillos pendiente debajo la largura de las reglas fue doze módulos. Los espacios que se dexaron limpios entre las cabeças de las reglas tuvieron diez y ocho módulos. En los architraves están los triglifos occurrentes cuyas cabeças cortadas a plomo salen a fuera por una mitad de módulo, la anchura de los triglifos igualará con la grosseza del architrave, pero a la altura añade una media parte de sí, hasta que llegue a diez y ocho módulos. (Lozano, F., 1582, Lib. VII, Cap. IX, p. 208)

The presence of the term *modulo* is explained by a literal translation of the Latin voice used by Alberti: "*Totam istius trabem crassitudinem divisere in modulos duodecim: quibus modulis omnes quae sequunt particulae dimetiuntur...*" (Alberti, L.B., 1485). Lozano uses it with the same frequency than *medida* enriching his discourse.

Both Sagredo and Alberti use the concept of *medida* while explaining the composition of capitals and architraves. Nevertheless, while Sagredo provides a systematic module to compose the architectural orders Alberti is not so rigorous about it. It is striking that Alberti gives a very general explanation about building columns but when he explains the formation of capitals and architraves he goes into depth providing the module for each of its parts. Terminological analyses lead us to the chapters or books of the treatise in which the author uses the word we are studying. For example, there are two chapters in Sagredo's treatise in which he does not use the term *medida* or talks about the importance of module. We are referring to those chapters dedicated to concepts of geometry and shape of the molding of cornices. The use of *medida* is more frequent in the introductory chapter, where the author justifies the importance of standards in Architecture and their origin. This chapter is the one that concentrates the higher degree of concurrences of theoretical and aesthetics words. Instead when reading Alberti we find the term *medida* linked to columns. And because for Alberti columns were decorative elements we can find this concept in the books to decoration.

We have already said that the study of the concordances of terms let us go beyond in analyzing concepts. This kind of research takes too much to be included in this paper but we consider necessary to present the words that find together with *medida* in both the treatises without going in depth with their meaning. For example in Sagredo's text *medida* often appears with the concept of part (understood like a portion of a whole). The concept of part is designated by the term *parte*, its synonym *pieza* or even by the noun of each architectural piece such as capital, basis, column, etc. The importance that the concept *medida* has to Sagredo is obvious when studying its textual relationships and concordances, because it appears always related with the ten terms of the list of concurrences: *forma, proporción, naturaleza, género, regla, orden, perfección, romano* and *composición*. Alberti's text presents some of these concordances: *naturaleza, proporción, orden, forma, regla, parte* and also with *número*, but the frequency of the concordances is quite different from Sagredo's. So if in Sagredo we find together *medida* and *forma*, in Alberti *medida* appears with the concept of *naturaleza* (Nature). That is because of the interest of the Italian in justifying the use of standards by linking them to something of a higher Nature. The idea that standards are found in Nature can also be found in Sagredo's treatise, but less intensely. In comparison with Sagredo the variety of concordances of Alberti is very scarce because the concept of *medida* is secondary in his treatise. By studying the relationship between the term and each one of its concurrences we obtain a lot of information about the meaning that term has to the author.

CONCLUSIONS

Tesaurus Terminológico-Conceptual can have an epistemological interest like a tool which offers new possibilities to deep scientific studies about treatises of Architecture. The research methodology that we present it is so versatile that can be used with any kind of term or concept like technical, theoretical, aesthetical or critical ones as well as any kind of treatise. Terminological and conceptual studies are useful not only for lexical research on architectural vocabulary, but also on additional research for the study of the origin, diffusion and establishment of models and ideas. In this paper we have presented a brief example of the first results of terminological and conceptual studies on Sagredo's *Medidas del romano* as well as Tesaurus's possibilities when facing a comparative analysis of texts. This tool lets us know the influence that textual sources used by the writer had in his discourse, not only in what concerns the subject or the organization of the text but specially in its concepts. A terminological and conceptual research is also useful to evaluate the theoretical influence that the treatise had on other contemporaries or subsequent authors. That is what we want to study in the case of Sagredo's *Medidas del romano*, evaluating the influence of this treatise upon the first Spanish translations of the main Italian architectural treatises: *Tercer y Cuarto libro de Arquitectura* of Sebastiano Serlio, translated into Spanish in 1552, *Los Diez Libros de Arquitectura* of Vitruvio translated by Lázaro de Velasco in 1564, *Los Cuatro Libros de Arquitectura* of Palladio translated by Juan del Ribero Rada in 1578, *Los diez libros de arquitectura* of Alberti translated by Francisco Lozano in 1582 and *Regla de los Cinco Órdenes de Arquitectura*, translated in 1593, whose results will be present in a future article.

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