

**The Role of Translation in the Development of Civil Engineering  
Codes: Cultural Transfer of Specialized Scientific Knowledge in  
the Second Half of the Twentieth Century in Colombia**

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CODES: CULTURAL TRANSFER OF SPECIALIZED KNOWLEDGE IN THE  
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A Thesis Presented

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### **Abstract**

A review of alternative concepts on scientific translation shows that language is an intricate system of rhetorical devices that cannot be interpreted easily. This thesis aims to explore the concept of cultural transfer in Colombia in order to shed light on the translation process within the scientific area through which the source text is manipulated; using paratextual materials such as footnotes, epigraphs, prefaces, we place particular emphasis on the context, agents, and institutions involved in the translation process. Some American and Colombian building standards and codes were selected and analyzed through a descriptive and socio-cultural perspective in which translation is articulated to study its context of production and reception, focusing on the value of cultural transfer and the dissemination of specialized knowledge. This project allows us to observe that translation is not a neutral activity and cannot be studied in isolation from its contexts of production and reception, extending the notion of translation within the translation studies area and revealing that scientific discourse is not universal.

**Key words:** Translation agents, Cultural transfer, Paratexts, Scientific translation, knowledge mobility, Civil engineering building codes.

## Resumen

Una revisión de los conceptos no tradicionales de la traducción científica muestra que el lenguaje es un sistema intrincado de recursos retóricos que no se pueden interpretar fácilmente. Esta tesis tiene como objetivo explorar el concepto de la transferencia cultural en Colombia con el fin de arrojar luces sobre el proceso de traducción dentro del área científica a través del cual se manipula el texto de origen; utilizando materiales paratextuales como notas al pie, epígrafes, prefacios, hacemos especial énfasis en el contexto, los agentes y las instituciones que participan en el proceso de traducción. Se seleccionaron algunas normas y códigos de construcción estadounidenses y colombianos y se analizaron a través de una perspectiva descriptiva y socio-cultural en la que se articula la traducción vista desde su contexto de producción y recepción, centrándose en el valor de la transferencia cultural y la difusión del conocimiento especializado. Este proyecto nos permite observar que la traducción no es una actividad neutral, no puede ser estudiada en forma aislada de sus contextos de producción y recepción, expandiendo entonces la noción de traducción dentro del área de los estudios de traducción y revelando que el discurso científico no es universal.

**Palabras clave:** agentes de traducción, transferencia cultural, paratextos, traducción científica, códigos de construcción de ingeniería civil.

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### **List of Abbreviations**

ACI: American Concrete Institute

AASHTO: American Association of State Highway and Transportation Officials.

AIS: Asociación Colombiana de Ingeniería Sísmica

ASTM: American Society of Testing Materials.

ATC: Applied Technology Council

ICPC: Instituto Colombiano de Productores de Cemento

NSR-10: Reglamento Colombiano de Normas Sismo Resistentes

SEAOC: Structural Engineers Association of California

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## INTRODUCTION

Any tradition of knowledge transmission from different languages necessarily involves a dynamic process of mobilization and circulation of textual and non-textual goods; this process has never been sufficiently visualized because, at first glance, the most important part is the result: this is, the translated text which is traditionally studied without its context. However, and despite the many roles translation plays in cultural, literary, and knowledge mobilization, only in the past thirty years some scholars have pointed out the role of translation in the transmission and dissemination of different kinds of knowledge placing emphasis on the process, networks and agents involved in the translation process.

Accordingly, translation, not as a linguistic transfer or a simple technical activity but as an active mediator between languages and cultures, provides a broader perspective of a given place in a specific period of time, giving translation its preponderant role as a source that might enable researchers to rewrite the history of societies. In Latin America, this new intensive scope has generated more studies, questions, and prospective issues connected to the history of translation.

Research in translation history has undergone different issues related basically to the lack of available data in a certain period. However, when reconstructing connections, we can define a methodology that makes visible all those features that were initially not so perceptible. In this sense, translation appears as an active tool to understand and perceive a culture:

In the last two decades scholars from a number of disciplines -mainly literary theory, translation studies, sociology, cultural studies- have become increasingly interested in defining the role played by translation in the shaping of Latin America viewed not merely as a linguistic transfer but a cultural interchange and as a way of asserting power, translation has informed studies on such topics as exploration and

conquest, multilingualism, cultural construction and identity formation in Latin America. The consequent greater awareness of the role of translation and translators in the region's colonial and postcolonial history has undoubtedly led to a deeper understanding of the fundamental task of translation in the construction of cultures and identities throughout Latin America (Goldfajn, 2010. p. 1).

We can say that in the Latin American context this effort has started to emerge slowly. This is precisely the purpose of this thesis, to examine a particular case that contributes to the history of translation in Latin America, particularly in Colombia in the scientific area, focusing on civil engineering codes and standards.

In order to determine the object of study, it is necessary to identify the process that led to the creation of local codes. Firstly, it is important to state that the development of engineering science is inherently attached to technological advances. From the nineteenth century in Colombia, the consolidation of the processes of industrialization has resulted from the interaction between various systems of society, the educational, technological, economic sectors, and foreign systems, and somehow these processes have gone through what takes place in other contexts. Thus, processes in Latin America and Colombia have not been oblivious to these changes, albeit more slowly, pushing or depressing the development of technology as a result of different interests. Due to this, it is necessary to study the contexts to understand the circumstances surrounding a particular phenomenon.

All theoretical models adopted in Colombia affected the design of a local engineering practice, always influenced by the great initiators. Thus, any prospective analysis of engineering is labeled by imported or introduced technological trends, models and regulations; in short, all the values, knowledge that have permeated society, culture and local science.

Such influence of foreign models in the Colombian context can be observed particularly in the adoption of engineering technical standards within the civil engineering area.

### **Problem Statement**

As previously stated, the role played by translation and various external agents to transfer models and adopt them to the local context has not been sufficiently studied. In the local context, not enough attention has been paid to scientific discourses related to scientific translation, apparently applying prescriptive and standardized patterns, understood as a linguistic transference from one language to another following the illusion of equivalence. Many scientists and particularly engineers consider their texts to be merely information to transmit. Under these circumstances, scientific language is basically presumed universal.

Briefly, it might be pointed out that this argument is dogmatic evading the multiple cultural, linguistic, social differences that these texts might contain. Undoubtedly, some scientists deal with the general perception of a technical practice, full of technical concepts and perceptions without considering these are not utterly fixed. Similarly, few studies have been reported concerning the role of translation in our educational context; it is necessary to highlight the work by Montoya (2014), in which the reorganization of the Educational system in Colombia with the influence of the models from the United States and Europe is clearly evidenced.

Particularly in Colombia, from the decade of the 20s of last century, the practice of civil engineering was influenced by foreign codes and standards such as AASHTO (American Association of State Highway and Transportation Officials.), SEAOC

(Structural Engineers Association of California), ACI (American Concrete Institute), ATC (Applied Technology Council). In this context of specialized knowledge mobilization, it is necessary to point out the significance of importation of codes through translation. We place emphasis on the case of engineers Alberto Sarria and Luis Enrique García (Pinzón, 2014) who decided to start around 1977 a commented translation that would be the genesis of an authorized translation for the Colombian context and would lead to the creation of a national code. Other official versions prompted by some institutions, national and international, and events such as the earthquake in Popayan in 1983 led to the promulgation of Law 1400 of 1984 which adopts the Colombian Building Code.

Through this importation of codes, the value or the role played by translation and various external agents to transfer models and adopt the local context can be clearly identified. It then becomes necessary to examine some codes, the relations between them, paratexts and make visible all the material that goes unnoticed identifying translation as a complex action which is supplemented by criticism, adaptation, interpretations, as well as processes and networks which involved translators, engineers, editors, and so on. All this work shows that translation is not only an activity that involves an original and a target text but other processes making it necessary to describe and evidence the transfer phenomena or the cultural exchange process, including all the material related to the process that could trace the historical evolution of these features. Consequently, translation in the specialized areas deserves to be further studied from the point of view of translation.

Beyond considering a historical reconstruction of the Colombian Civil engineering code, it is expected to study different factors (agents, institutions, translations) involved, examine a number of standards both in the context of production and reception,

and determine the factors surrounding this practice. Correspondingly, it is appropriate to make a description and analysis of the authors, criticism, related publications, in order to understand the context.

As little is said about this process, and considering translation firstly as a cultural process involving the interaction of local contexts with foreign contexts, and secondly as a cultural transfer process involving the mobility of texts, people, institutions, it is necessary to adopt a descriptive perspective that considers the target context beyond translations.

### **Hypothesis**

The engineering practices in Colombia and Latin America emerged not as a result of an endogenous process, as happened in Europe and the United States, but as a product of a series of importations of large production, and knowledge centers. All theoretical models imported not only affected the design of a local engineering practice, but the creation of standards, training programs, society, and culture in general. This transfer process also involved serious transformations allowing adaptation and development of new materials. Thus, translation not only plays an important role in the history of ideas, knowledge circulation and modeling concepts, but also in the formation of societies and institutions.

### **General objective**

To describe and analyze the role of translation and agents in the production and transfer of specialized knowledge in the field of engineering in Colombia in the second half of the twentieth century, from the study of adaptation, translation, and incorporation of building codes and standards in the local context.

### **Specific objectives**

To build a corpus of texts in order to establish the socio-historical and disciplinary relationships involved in the processes of appropriation of the civil engineering codes in the Colombian context between 1970 and 1998.

To develop a paratextual analysis to determine the inter / extra-textual relations, the vision of translation, interinstitutional/ transinstitutional relations, and to identify the dynamic process between the various agents present in the development of a civil engineering code within the Colombian context.

To place emphasis on the value of cultural transfer as a process that allows revealing how the Colombian scientific discourse is constructed from the importation of external models to the study of translation contextualization.

### **Corpus Description**

This investigation, addressing a contextual methodology and a cultural and descriptive approach to translation, proposes to describe and construct the context surrounding the production of translations of codes of nation building.

To this extent, the corpus used in this thesis is composed of a set of international rules and regulations at first, and then a small corpus of paratexts was established: including introductions, prefaces, footnotes, correspondences that constitute the material Central to this thesis.

Similarly, information on the agents involved (individuals and institutions) in the process involving the reconstruction of their profiles, having limited access to information was collected. As pointed out, data is difficult to obtain within this area: "Access to data is another factor to be reckoned with: due to issues of confidentiality and lack of familiarity

with subject knowledge, scientific material, outside popular science publications, is not always accessible” (Olohan & Salama-Carr, 2011, p. 180).

All this information is supplemented with relevant documentary analysis to understand the development of the construction of these codes and personal communication with the engineer involved in this process. The object of these exchanges allowed the clarification of several aspects of this exchange.

## **Plan**

This project is divided into four parts. In the first part the theoretical and methodological framework underlying the research are addressed. The first chapter provides an overview of recent studies in the field of history of scientific translation in the Latin American context. The second chapter addresses the theoretical and methodological parameters that guided the development of this investigation. An analysis of the contributions of the history of translation both in the field of cultural history as in the field of scientific translation is presented. In this case, translation contributed significantly to the scientific field in Colombia during the twentieth century. For this reason, we focus on the value of cultural transfer and the dissemination of specialized knowledge. Assuming a descriptive and cultural perspective, translation cannot be studied in isolation from its contexts of production and reception.

The third chapter presents the analysis of paratextual elements such as prefaces, epigraphs, notes, which are definitely complementary material to understand a particular text, and its context of production. Finally, the last part presents the results and the findings of the analysis; this study allowed us to extend the notion of translation within the translation studies area and revealed that scientific discourse is not universal.



## Chapter 1

### Science and Translation

This chapter provides a general overview of some of the available literature in translation within the field of scientific discourses, particularly about translation processes and circulation of knowledge between cultures. At the very beginning, in order to overcome some persistent terminological issues that often impede a transparent discourse when defining specialized discourses, some of the terms are examined. Then, a historical path is drawn to identify some particular merits from both translation and science; this is, since the invention of writing, translation has played a central role in disseminating scientific knowledge, so it is from the history that this work obtains a theoretical and methodological standpoint connecting the fundamental concepts taken from history and translation itself.

As we are describing the role played by translation, it is necessary to detail some issues about this chapter. This thesis is not a comprehensive overview and it is not focused on traditional equivalence-based and corpus-based approaches<sup>1</sup> to translation but on historical-descriptive approaches. Basically, it has two purposes: to describe the path translation has traced in the process of transfer of learning contributing to the building of societies (Montgomery, 2000), in the particular case of Colombian standards. A concept of transfer that goes beyond the traditional sense of transmission between two poles, and expects to be inscribed into the area of history, particularly, knowledge transfer in the area

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<sup>1</sup> Several authors including Gabriella Saldanha (2013) have compiled different approaches related to translation studies, pointing out that linguistic and corpus-based translation studies have attempted to reveal regularities in translation, at the level of universals, being valuable but also sidelined. This reductionist view has been challenged by different approaches including some process-oriented, participant-oriented research and context-oriented approaches indicating that some weaknesses might be overcome combining different approaches (Saldanha, 2013).

of civil engineering and standards in Colombia. The other purpose is to make visible the task of translation and translators, through the study of paratexts, agents, and general contextualization, then to give scientific translation its central role in the construction of a scientific discourse and the dissemination of knowledge.

These sections are divided as follows: firstly, an overview of the history of scientific translation globally is presented in order to point out the general ideas that help shape the concept of transfer, central in this discussion; secondly, a brief review of some of the investigations around this topic in Colombia is introduced. And finally, some correlations between the centrality literature has played in the general conception and theorization of translation, due to translation history has focused almost exclusively on literary genres and texts, and the expected scope to extend translation history research to more marginal areas of translation including the translation of non-literary genres, specifically scientific translation in our case are presented.

### **1.1 Science Translation History**

Before considering any historical background information or specificity, it is necessary to clarify the indistinctive use of some terms such as science, scientific and scientific-technical translation in this text which is not central in the discussion, but might help create an image of the historical path intended to be represented. The term science involves the systematic study of the structure and behavior of the physical and natural world through observation and experiment. Maeve Olohan (2007) presents a discussion about the binomial phrase: “science and technology” concerned whether these two terms can really be grouped together in any meaningful way when referring to a particular field of translation.

The word science is a vast term that can include many branches and subbranches, so it is very important to note that tracing the history of translation in other genres different from literature or religious texts, we are pointing out to the specific knowledge referred to scientific practice in general fields, since scientific production includes a range of theoretical and philosophical approaches about nature and universe, technical manuals, and handbooks disseminated in the Hellenistic era, science treatises in contemporary word, so herein the terms science and scientific translation include both, thinking and practices related to this endeavor. Generally, the term scientific-technical translation is used to refer to specialized discourse related to the technical field, but we are not using the adjective technical, because as it could be seen from the discussion above, the terms science and scientific include a range of interchangeable features.

Translation has long been associated with the image of travel. From ancient civilizations, the idea of knowledge crossing boundaries of time, place, power, and language has served to symbolize the travel across cultural frontiers. As the word knowledge encompasses all the discovered and created fields of human derived evidence, and the process of translation within a cultural frame embraces many fields, we are pointing out the term, specifically, to scientific knowledge. Considering science as a cultural product, the triad *translation, knowledge and culture* emerge as a triangle we are going to use throughout this text. Eliciting the statement by Giordano Bruno: “From translation all science has its offspring” (Salama-Carr, 1995, p. 95), Myriam Salama-Carr presents scientific translation as a transformation, as an instrument of miscegenation and progress; this is: a system with multiples bifurcations is derived from the idea that knowledge travels through multiple destinations from major cultural intellectual centers to other domains.

Accordingly, as translation is not an isolated activity, it dynamically involves a wholesale diversity of mediators, texts, languages, negotiations, critically attached to the notion of transfer, a concept developed more deeply in the second chapter, that incorporates the cultural exchange process, including verbal and non-verbal features that might shape the translation process; critical in the sense that they aim to reveal different issues that frequently go unnoticed in translation discourse. To fully understand the importance of the notion of transfer in the development of the triad *translation, knowledge and culture*, it is essential to expand the notion of transfer. Scott Montgomery (2000) has deeply reflected about this concept framed by the history of translation or science itself:

The transfer of learning has been critical to the building of societies, those we call “modern” the introduction of new concepts has proved the source of new capacities for ordering, directing, and expanding human existence. Placing the knowledge of one people into the hands of another involves the transfer of certain powers: powers of expression in the case of literary or artistic knowledge; powers over the patterns and organization of life in the case of political, legal, or religious ideas; and, in the case of science, powers of imagination and practice with regard to the material world and uses of it./ Such transfer therefore defines a critical historical process/ Translation has been a powerful means to both encourage and manage, even control in part, the movements of foreign influence. (Montgomery, 2000, p.3).

From ancient civilizations, traveling from Asia to Greece, from Greece to the Middle East, and from there to Western Europe, America, and the entire world, the image of a map of knowledge migration made visible all the transfers that shaped and reinforced the binomial translation-knowledge and indicated the “waves of translation activity”<sup>2</sup> as a prerequisite for the export and import of scientific ideas (Krüger, 2015).

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<sup>2</sup> This concept is not going to be deeply studied herein; these waves of translation are coined by Krüger (2015) when referring to the torch of knowledge developed by Salama-carr; the first beautifully described the

Following this wave movement, few historians have focused on how translation produces and distributes knowledge in sciences. Translation history is predominantly concerned with literary and religious translation; historians of science with some exceptions have shown little interest in studying the role of translation in the achievement of a history of science, despite the role played by translation in the history of ideas, the circulation of knowledge and the modeling of concepts. The historical research has been conducted with case studies and contributions to the history of scientific translation for several periods and regions such as the case of Montgomery (2000), Salama-Carr (2005), and some others further described. It is not understood how just recently this important area has been given relevance, taking into account the essential role of translation in all areas of knowledge. “Translation is involved at every level of knowledge production and distribution in sciences” (Montgomery, 2000, p. ix).

In addition to this lack of recognition to translation, over the centuries, translators without being considered the universal repositories of knowledge (Salama-Carr, 2005) have often transformed the content of works of science and philosophy; however, neither translators nor translations have been recognized as preponderant in the pursuit of history. In addition, translation theorists have dealt almost exclusively with literary texts as the object of empirical research and the creation of a theory of translation, a concern that is going to be expanded in section 3. Not as part of this work, but as a future proposal for other works, neither dissemination of knowledge through translations has received enough attention, nor misunderstandings produced during this process:

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intention of this map: to guide the reader to a brief journey across expected and unexpected boundaries at some extent producing persistent political and cultural anxieties about national identity and the issue about authenticity which is not the main objective of this text. So the term is just going to be used as a reference.

“The contribution of translation to the spread of knowledge is obvious enough, but something should also be said about misunderstanding, a topic that has not yet received from cultural historians the attention that it deserves” (Burke, 2009, p. 35).

Montgomery (2000) presents several case studies, examining the history of translating astronomy -as the oldest of sciences- in the West from antiquity to the Renaissance, stating that knowledge came from several episodes of translation. The first episode is the Greek works, which were translated into Latin. The second is the transfer of Greek texts from communities belonging to the Bizantine empire forced to migrate, so the information was transferred into Syriac and then re-translated into Arabic. A number of Hellenistic knowledge and Greek scientific texts belong to this episode. Other processes of transfer were remarked such as the case of the Toledo, Granada and Cordova cases in Spain, revealing great centers of Arabic learning. Information migrated from there to the rest of Europe. In this process, translation played a central role, particularly with works of science and philosophy. Different methods ranging from literacy to interpretation were observed by Montgomery in this vast task. Similarly, Clara Foz (2000) addresses the issue of the dissemination of knowledge relating it to power issues. The researcher studied the case of Toledo in the Middle Ages and revealed the dependence of translators during this time on the demands of certain bodies of power. For instance, she exposes the case of Alfonso X who ahead of scientific conceptions of the time promoted within the scientific scholars who worked for him in his astronomical treaties, the creation of a new style and philological standards that lead to more comprehensible texts.

Some other case studies are interesting from the perspective of dissemination of knowledge, history and a cultural approach. For instance, the work by Paoletti (2005)

presents an analysis around three translations of *The Voyage of the Beagle into Spanish*. All of them are studied from “seer” or “seen” points of view, which are related to their place of publication, the content visible in each translation, the influence of publishers, placing emphasis on the different features of Darwin’s image in the Spanish-speaking world, known previously just because of the translation of *The Origin of Species*.

Observing the movement of science in the non-Western world and remarking processes of adaptation and adoption, Montgomery points out the introduction of Western knowledge in modern Japan, placing emphasis on the cultural context and the status of European knowledge, mainly from scientific texts being translated into Japanese. By the early 1900s, Japanese scholars began to rely on knowledge obtained from other languages different from Japanese and Chinese, particularly from English emerging as a lingua franca in Non-Western countries.

The last object of studies analyzed by Montgomery situates the analysis in the contemporary context, considering translation as “a continuing formative influence in the making of scientific knowledge” (Montgomery, 2000, p.253). Some concerns related to English as a lingua franca for science are illustrated using references to scientific English in India, to Internet science and to geology. Some comparisons between translations from English and French were considered.

This vast journey of cultural and linguistic transfer reveals insights of how much science affects translation. Translating science poses several questions on the universality of science placing emphasis on the importance of transfer of knowledge, trying to differentiate both poles, linguistic and cultural. Some of the questions can present a very valuable starting point for future research. It is important to notice that unsolved questions

expressed by Montgomery are not going to be developed herein, but some of them might reveal part of our inquiries about transfer, central in our discussion:

What remains are innumerable questions: How have the effects of translation been dispersed among the various disciplines? What uses did such thinkers as Copernicus, Galileo, or Kepler make of translated materials? What important similarities, contrasts, or cross-overs might exist between eras of scientific and literary translation? What have been the social structures of translating groups or communities? Are there other cultural-linguistic themes (such as displacement or orality) that might be discovered from comparative studies of different epochs? How did Islamic intellectuals view the translation of their own works into Latin? What role did translation play between 1880 and 1920 in the building of modern particle physics? What effects might the spread of scientific texts have had on the history of the book, on reading, or on specific relationships to the written word? And so forth (Montgomery, 2000, p.294).

Despite attempts at answering such questions may bring about unsolved premises, through this historical overview, translation is clearly seen as a tool in which mobilities of knowledge are integral to the science history and fundamental to understand the scientific past and present. Translation transforms texts and cultures. For Montgomery (2000), translation is a true cultural product; it is observed that this vast reflection of translation is not completed, but the image goes farther from the simple symbolism between texts and recreates the experience of different cultures trying to penetrate and receive inputs in the vast map of cultural transfers.

In the same vein, following a different methodology, not appropriating the concept of transfer but pointing out the different operations that permeate the knowledge discourse, Salama-Carr (2005) describes the importation of knowledge to China, firstly revealing the introduction of buddhism, but then of medicine, astronomy and mathematics; in this



section, not only was China interested in the spirit of multiculturalism through learning from foreign influences, but in the translation of some Chinese fundamental works making Western countries to be more familiar with Chinese culture and science. A key factor in this pursue for the knowledge dissemination path, the study of Arab translators in the Middle Ages, was enlightened showing how this cultural exchange was not only transmitting knowledge between linguistic communities and across generation of scholars, but determining in developing a scientific language. Finally, Salama-Carr (2005) introduces the School of Toledo in which the dissemination of knowledge played another role along with those previously mentioned: translators adapted and produced new insights from this because of ideological constrains: this is the appropriation of knowledge through translation.

As previously stated, theoretical paradigms from scientific knowledge have been appointed as neutral and universal. Such as Olohan and Salama-Carr pointed out:

Translation studies has traditionally taken inspiration from traditional LSP (Language for Specific Purposes) research and terminology studies in analyzing intrinsic features of specialized discourse; those studies often perpetuated a view of science as consisting of absolute truths, involving objective and referential communication. This approach overlooks the nature of terminological work, which is not merely linguistic but also involves conceptual reflection (Olohan-Salama-Carr , 2011, p. 180)

This gloomy picture of staticity, granted to scientific knowledge, is not different from the one granted to translation, but some other authors including Montgomery (2000) appointed that translation should be considered more than an objectively mechanical process, despite some classical authors in the literature on translation, neglected the value of texts dealing with non-literary issues ignoring their contexts and the cultural and

ideological elements surrounding them. What seems clear, however, is that some authors have slightly started to notice the invisibility of non-literary texts (Olohan, 2007; Montgomery, 2000; Salama-Carr, 2005) and to confer their preponderant role within translation studies; however, this issue is still unrecognized within the translation studies discipline and is considered less prestigious as a model (Salama-Carr, 2005).

Considering the features developed by the authors previously mentioned, the centrality translation has been conferred and some of the process presented in the overview, scientific theories are no longer immutable. Scientific writing is not only a representation of the ideas of science; it is the integral creation of new meanings and inserts problem in a given context. So science can be seen as a social construct that has seen concepts such as culture, science as an institution, science and rhetorical practice, among others (Salama-Carr, 2005).

Just as scientific discourse has begun to be addressed from other approaches, the discourse on the translation of science has allowed permeating these notions; it has started to give translation a position in the dissemination of science: all science is indebted much of its development to translation (Salama-Carr: 2005). Thus, the study of the history of translation can elucidate the relationships between linguistic communities, revealing the triad *translation, knowledge and culture* we want to map:

Translation can also shed light on relations between majority and minority language communities, between imperial centres and colonial fringes as well as between victors and vanquished. Research into reviews of translated works can give insights into their reception and the reasons for their success or lack of it. (Chesterman: 2002, p.17).

Among the questions that can be set to determine a historical sequence, we can ask, for instance: why certain texts are translated rather than others, when, how they are

translated. All these questions provide a historical and historiographical panorama of translation (D'hulst, 2001).

Drawing a direct relationship between science and translation concepts traditionally used in the literature needs to be attached to other discourses; so notions such as culture, cultural transfer and mobility, not traditionally associated to scientific translation, appear to confer certain degree of localism, an objective component to scientific knowledge, and direct interactions on social structures and practices (Montgomery, 2000).

## **1.2 Scientific Translation History in Latin-America and Colombia**

In line with the generally low status of scientific translation in the discipline, there have been few explicit attempts at providing case studies or comprehensive theoretical accounts concerned with scientific translation. In Colombia, particularly the study and description of the construction of a scientific discourse related to the scientific translation has not been visible enough and tends to be thought of as a fixed form, a simple linguistic transfer from one language to another following the illusion of standardization. As it has been pointed out, many scientists and engineers conceive their texts particularly strictly as objects to transmit information, without considering that concepts themselves are not fixed, they may vary within a culture, trend, regulation, and so on:

Par conséquent, on peut dire que l'approche la mieux adaptée à la traduction spécialisée est prescriptive non dans le sens déterministe du terme- c'est-à-dire qu'elle n'enlève pas au traducteur toute liberté-, mais plutôt dans le sens probabiliste tel qu'indiqué par Chesterman. En ce sens, font partie de cette catégorie les typologies textuelles caractérisées par une approche traductive standardisée (Scarpa, 2010, p.93).

As Georges Bastin (2010) points out, history cannot exist without texts; for this reason, history depends on translation, but translation is not considered as an auxiliary discipline for history. In order to overcome this “void” in history, Bastin proposes three main objectives for studying translation history in Latin America to give translation the relevance it needs: firstly, to revive the cultural, historical and ideological heritage practically ignored, to study the norms of translation proper to the region and, to clarify and correct some of the facts uncovered or hidden behind blurred historical data in which translation might help uncover information.

Within the Latin-American context, the study of history through the lens of translation is increasingly growing, leading to a deeper understanding of the fundamental task of translation in the construction of cultures and identities (Montoya, 2012). Bastin (2010) quoting Lepinette, states:

La traducción constituye primeramente un proceso de transculturación o de mutación de las significaciones culturales de los textos traducidos. Las cuales no pueden ponerse en evidencia sin la historia de la traducción. [...] La historia de la traducción debe por lo tanto ser la historia de una transformación cultural (p. 26).

It is then mandatory to identify the process that has allowed the mobilization of knowledge following the triad *translation, knowledge and culture* in the Latin American and Colombian contexts. It has occurred, probably, more quietly in the Scientific context, as an almost invisible feature of mobility along national and linguistic borders, both within and between cultures. The potential of this endeavor is enormous, regarding the great amount of intellectual and material exchanges between the Colonists and Latin-American countries since independence, including for instance Rousseau’s social contract, the US

Declaration of Independence and Federal constitution, the Venezuelan and Argentinian Newspapers, (Bastin, 2010; Montoya, 2013; Waisman, 2010). However, it is not our task to link all the processes of transfer occurred in Latin America, but to point out specifically those related to scientific translation.

As in the case of the global context, few researchers have been interested in non-literary production. Some works are relevant in this point. The work developed by Nayelli Castro (2013) deals with the translation of classical German philosophy in different periods of Mexican history: a general approach (2010), a post-revolutionary Mexico in the period between 1940 and 1970 (2013). Some interesting focuses Castro points out and relevant to our work are the concept of intellectual networks of translators not visible in other related works, and the emphasis on building a cosmopolitan and multilingual space (2010). There is an interesting standpoint Castro reflects about, the specificity of philosophical translation, rising the question whether is relevant to differentiate the translation of philosophy from some others (2010). Another interesting approach taken from Castro is the figure “translator-philosopher” in which the agent becomes a double agent, translator, thinker. This work can reveal some of the central concepts used herein: transfer of knowledge, translation, knowledge, culture, and agents. Additionally, the paratextual analysis developed by Castro makes visible the work of translators beyond literacy and towards a philosophical critique. This work developed by Castro is particularly relevant because it goes beyond case studies, working with the research study in Latin America with no literary or religious texts. It is certainly inspiring for this research because it also expands the methodological scope on research in translation history by using those unconventional sources.

In a similar vein, the work developed by Foz & Castro (2013) presents valuable insights about the introduction and circulation of positivist ideas in Argentina and Mexico as these two countries were recognized as major publishing centers in the region, between 1870 and 1950, before the introduction of phenomenology and existentialism. This work focuses on agents (including translators and publishers) and the dissemination of knowledge. The authors draw attention to the need to analyze translations as phenomena belonging to the target culture. This methodology coincides with Bastin (2010), proposing that the objects of study are not given, but constructed, and observed through the studies. This research is also valuable because it presents an early interest of translating educational materials, taken from Augusto Comte and Herbert Spencer, free from religious influence and some other materials focused on the technical field, inspired mainly by the French Enlightenment. Thus, positivism represented the birth of thoughts in various fields of knowledge in Latin America. The authors point out the voids in history of translation in Latin America and the necessity to continue studying it.

Some other works related to scientific knowledge have been developed in Latin America. Adriana Minor and Joel Vargas (2015) address a case study on the profile of two scientists who exercised cultural diplomacy. Using biographical data collection such as historical archives, personal communications, memorandums, and bibliographic references, this work is not a systematic study but rather the reconstruction of the profile of two figures in a historical contingency adopting a new profile, showing the possible influence of science (and in a brief case, translation) in power relations, connecting these agents rather than knowledge holders, as figures acting as point of convergence between disciplinary expectations and both local and international interests.

In the Colombian context, the research about non-literary translation has not been enough developed. Paula Montoya (2014) deeply studied the different functions of translation in her work about “La Escuela Normal”, a newspaper devoted to transmit knowledge about education in the context of formation and consolidation of national states. As rooted in the national identities, the investigation reveals a deep relationship between translation, education and political hegemony. The pedagogical model imported disseminates the ideas of Pestalozzi and some other American and European pedagogues and publishes and distributes freely during eight years the newspaper mainly in schools, libraries and scientific institutions. The vast contribution of this work enlightens the ideas about contextualization, what kind of texts are translated (at some extent, answering the questions proposed by Chesterman: what is translated, why, and so on), and gives relevance to history, knowledge dissemination, process of transfer, agents, contributions to from history of translation to other disciplines, in this case, pedagogy, it opens the narrow path translation in Colombia has been following, and raises questions about what has to be done in order to achieve a true vision of translation.

Under this brief journey, we can notice there is an emergence of translation studies in different fields, but it is mandatory to ask many questions that help revive a fertile ground of transfers plagued with traditional studies presenting the dichotomy original-translation, not giving enough relevance to agents, history, networks, mobility, transfer processes, and some other concepts that might help fill the gaps and understand national identities. Accordingly, we were able to identify the triad *translation, knowledge, culture* through different perspectives such as the case of circulation of positivistic ideas and knowledge mobility by Foz & Castro (2013), the figure of the translator by Castro and

Minor & Vargas separately, the role of translation in the dissemination of knowledge, education, and the creation of a national identity developed by Montoya (2014). Few studies have achieved this vision of science translation, beyond a deterministic, prescriptive work, situated in the texts, looking rather other objects such as processes, construction of identities, transmission and appropriation of scientific knowledge in the scientific field, and possibly the translation self-creation promoted by translation.

### **1.3 The status of scientific and technical translation in translation studies**

As researchers often point out, the scarcity of translational research carried out in the Scientific translation field, leads to an image of science translation as easier than other forms of translation, because of a perceived universality of scientific thought (Olohan, 2014; Montgomery, 2000).

Conceived as another device over the great body of art, cultural fields, the plural space where languages move, translation appears as the reinscription to letter, as the mobility of many of these representative bodies. Translation as an old but recently formalized practice has been studied from other areas of knowledge and has also contributed to the evident gap between the categorization of the speeches. At this point, the reflections of translation have traditionally been evidenced in literary discourse, relegating the spirit of scientific discourse to other interests. The constant references to the creative spirit, towards an ambivalent language, towards a reference to culture continue defining the closed circles in which the analysis of translation studies moves; the ideology seems to have no place in the discourse of sciences.

In general, the scientific discourse has certain textual features that have already been studied. Beyond textual analysis, scientific discourse is presented as universal, no



matter if it is a transfer that defines a historical, communicative, cultural and even educational process.

Hermans (1999) goes beyond classical ideas about reflection on translation and discusses how translation studies have been relegated, influenced by the myth of "genius". In his text, taking as a fundamental corollary the renowned McFarlane claim that any theory of translation should be "diagnostic rather than hortatory" (Hermans, 1999, p. 18), he opens a proposal towards the descriptive, analytical, open boundaries. There is a specific section in the text in which literature is seen as a dynamic system, where there is a conviction that there is a continuous interplay between theoretical models and practical case studies.

What seems clear, however, is that the views held by different thinkers are to some extent exemplary because the reflection on scientific translation is relatively ignored and it is seemingly less significant for translation models (Salama-Carr, 2005). Over the past few years, the situation has changed slightly and scientific translation becomes more visible in translation studies.

Scientific texts are neither fixed nor stable. The books have never been permanent except as literal objects, mummified in a museum. New editions of plays, novels, poems, school manuals are constantly appearing with variations, but also new editions of treatises, science books, standards, norms and so on. In a similar way, not only the cultural realities are assumed unstable, but also the scientific ones. All works considered classics or fundamental have retranslations which are separated by temporarily historical issues that are no longer authority when their legacy is over. So Montgomery (2000) sees translation as the process by which the written works acquire their history, no matter whether it is poetry, literature or science. Montgomery highlights how valuable, for example, had been

tracing the sequence and variations in translating the *Principia Mathematica* by Newton and differentiates the nuances among the different languages (2000). Montgomery himself marvels at the immeasurable library of scientific texts and all that can be said and questioned in these texts. Translation has shown to be a replicator of science through time and inevitably this diversity of texts reveals a variety of discourses in the language of men. This diversity is like a huge laboratory, whereby the movement of knowledge is crucial to understanding the present and the past.

In the last decades, scholars from a number of disciplines, have become increasingly interested in defining the role played by translation in the shaping of Latin America culture not just as a linguistic transfer but as a cultural interchange (Montoya, 2104; Foz and Castro 2013). This research has informed translation studies in cultural construction and identity. But, in our context, the word culture has depicted the path of literary translation, particularly in the well-known magic realism theme not giving any importance to other forms of translation. It is then necessary, to expand the concept of culture that includes different phenomena and approaches.

This chapter provided basic information related to the history of scientific translation, encompassing the perception of the area and some issues this area has overcome. Then, some Latin American, including Colombia study cases were presented, covering some thematic, theoretical, and methodological proposals. Highlighting the lack of studies within the area, the last part of the chapter presents the status of scientific translation in the discipline of translation studies pointing out the scarcity of translational research carried out in the field of scientific translation but projecting on the research

horizon different questions that might help expand the overall corpus of scientific translation texts and analysis.

A valuable aspect that might be highlighted is that scientific translation has obtained previously ignored cultural functions. Here, the term cultural functions is used in a broad sense that includes how translation allowed identities to be constructed, enriching local production, transmission, and appropriation of scientific knowledge, the strategies used by translators, and highlighting the appropriation of texts according to their aims.

Due to the lack of these studies, it is then necessary to carry out investigations in Colombia that enlighten the scarce panorama of scientific translation. As it is already known, translation has been a powerful means to both inspire and direct, the circulation of knowledge, but the effects scientific texts have had in history regarding the development of societies remain unobserved.

## Chapter 2

### Theoretical and Methodological Frameworks

#### 2.1 Theoretical Framework

This chapter describes the main theoretical and methodological principles that underlie and shape this research. Since our object of study is the role of translation and agents in the production and transfer of specialized knowledge in the field of engineering in Colombia, we want to address the role of translation in the dynamics of cultural exchanges, particularly, the role played by translation in the dissemination of specialized and scientific knowledge; for this reason, this study considers assessment issues through a contextual, qualitative methodology that allows us to consider texts in their target contexts.

In order to accomplish this, at first we will discuss theoretical aspects in which we are going to analyze how from a descriptive and sociocultural perspective of translation, this practice broadens its horizons, expanding at the same time the definition and the scope of translations, including not exclusively literary texts. Similarly, we will consider the historical perspective that led to the development of current approaches of translation studies.

As a starting point, we are going to consider the contributions made by polysystems and descriptive studies, to understand how the different systems interact and are linked to social and cultural factors, including science as a system. Also, we are going to adopt particularly the concept of “assumed translation” as a central notion to expand the subject matter of our investigation. Then, we address two central concepts for this research. On the one hand, we embrace the concept of paratexts that allowed us to locate translations in the target context and hear the voice of translators and other agents involved in the process. On

the other hand, the concept of cultural transfer is implemented to understand the connections between the different elements interacting in a translation process.

Finally, we describe the methodology used in this research clarifying aspects of the history of translation, describing the corpus and the research stages. With regard to the methodological part using a single case study design, we are limiting the object of study to the context of the adoption of a Colombian Building codes and standards, by means of qualitative methods and a socio-cultural approach.

### **2.1.1. Grounding the Foundations for a Descriptive Approach to translation**

In this chapter, there is a particular interest in thinking about translation as a practice located in cultural terms, this is, as a purposeful process from the selection of texts, the work of adaptation, and distribution in certain areas; in other words, the end result is a product whose position and function are determined by the agents aiming at particular goals, considering the relationships and translations as facts of the culture which hosts them (Toury, 2004). In order to understand the way in which translation theory set or produced a breakthrough: the separation from linguistics standpoints and cultural approaches that somehow extended the vision of translation through different windows, it is necessary to adopt the concept of history of translation, not seen as a sequence of events but a historiographical phenomenon to embrace the concepts of cultural transfer and agency. This concept of historiography will be expanded in the methodological considerations.

Opposed to the traditional view of translation theory, from applied linguistics<sup>3</sup>, this

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<sup>3</sup> Mona Baker (2000) in several works draws a distinction between two approaches in which literary translation is subsumed: “In recent years, however, the value of linguistic descriptions of translation has been questioned within the emerging discipline of translation studies. Indeed, much of the current literature on translation assumes that there exists a clear-cut divide between two broad orientations in the study of translation: one informed by linguistics and generally referred to as ‘linguistically-oriented’ and one largely

proposal envisions a research standpoint of translation through its historical perspective, as an attempt to extrapolate the translation features embedded in the historical context, requiring at some extent interdisciplinary approaches in order to carry out particular aspects of historical research. It is necessary to place emphasis on the concept of translation enlightened by the notion of historiography. This concept of translation historiography has been growing interest in a wide range of disciplines dealing with the past or the present; this is how historiography plays a fundamental role in tracing the history of translation. Such as Berman pointed out, the construction of the history of translation is the first task of a modern theory of translation. It is impossible to separate the history of translation from history of languages and thus, of cultures (Berman, 1992).

Nevertheless, this work is not focused on history or historiography strictly; the direction we are going to take follows the line of local case studies, because “Local studies are also a dominant form of historiography in science” (Olohan, 2014). Following this approach, we are no longer interested in grand narratives of scientific progress, historical events, universalizing perspectives, but in documenting smaller units that explore the relationship between translation, history and science.

Since the 1980s, the linguistic approach of translation has been lagged behind by the historiography of translation (Tahir, 2012). Part of this transition is due to cultural reorientation of translation research, broadening the concept of translation beyond the transmission of languages, including questions of cultural and contextualized conceptions (Basnett & Lefevere, 1998). Theoretical standpoints made by different scholars in the 50s

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based on a mixture of cultural studies and literary theory and generally known as the ‘cultural’ approach and sometimes presented as having initiated a ‘cultural turn’ in the study of translation” p.20

and 60s crossing different areas of knowledge essential to the theoretical foundations of the discipline such as linguistics and comparative literature, lead to a relatively systematic study of the translation under different theoretical proposals including polysystems theory, descriptive translation studies, school of manipulation. Converging in the 80s, the impact of these approaches has marked the course of translation, because these approaches, such as Tymoczko (2007) pointed out, were considered the pioneers in thinking translation as an activity that manifested the connections between translators, translations and context and work that reflected the linguistic and cultural asymmetries. This is precisely one of our main courses: translation not seen as a linguistic phenomenon but contextualized.

As Snell-Hornby remarked, language is not an isolated phenomenon developed in a vacuum and cannot be considered outside its context (Snell-Hornby, 1995). This strong statement makes visible the notion of texts inserted in a dynamic cultural network:

While the classic approach to the study of language and translation has been to isolate phenomena (mainly words) and study them in depth, translation studies is essentially concerned with a web of relationships, the importance of individual items being decided by their relevance in their larger context of the text, situation and culture (Snell-Hornby, 1995, pp. 35).

To understand this cultural focus on translation, it is necessary to define the main approaches that guided this cultural breakthrough.

The Polysystem approach was established concurrently with the descriptive paradigm in translation studies (Hermans, 1999). This theory was proposed by Itamar Even-Zohar in 1990, and eventually reformulated in posterior studies, trying to overcome the problems when translating Hebrew literature. This theory is conceived as “a heterogenous hierarchized conglomerate (or system) of systems which interact to bring

about an ongoing dynamic process of evolution within the polysystem as a whole” (Baker, 2009, pp. 197). In dealing with translation within the polysystem approach, a work is not studied in isolation or as a part of a closed system; instead, it is part of an open system; literary system, properly, probably permeated by others. In other words, literature being part of a system, correlates with language, society, economy, politics, ideology (Even-Zohar, 1990). These correlations between cultural systems offer multiplicity, complexity, and heterogeneity; features not visible in previous universalizing theoretical approaches, such as functionalism not transcending the dominant orientation of any single culture (Tymoczko, 2007, pp. 38). Within this frame, translation is not considered from a single text analysis methodology, but as a primary source revealing valuable information such as the way cultures construct self- and external images and representations in different periods of history (Marinetti, 2011).

#### **2.1.1.1 Cultural approaches: Is there a place for scientific texts?**

Despite being considered from the point of view of literature, the polysystem theory enlightens the general theory of translation, not only for literature systems, but for different phenomena. Accordingly, literature is not only studied in the traditional sense of the word alongside the social, historical, and cultural forces, but in all the systems dealing with cultural foundation; in our particular case of interest, some of the elements derived from this scope might help to open the debate to wider issues than those presented under the previous approaches, considering science as a cultural product (Kuhn, 1962). Using the term “normal science” this researcher explains how paradigms are essential to scientific endeavor, seen as a series of paradigms not statically, impartially or simply studying the



world, but relating it to other human activities, Science involves a set of actors embedded in social networks particularly governed by rules.

The analysis of a particular system reveals an aggregate of features resulting as a consequence of the interrelations with other elements in the network (Hermans, 1999). Thus, the term polysystem addresses a dynamic but coherent conglomerate of interconnected elements, opposed to homogenous, simplistic and reductionist viewpoints and theories. Previous linguistic approaches and prescriptive conceptualizations were particularly restricted to describe the complexity of problems clustered around translation. In this sense, as pointed out previously, literature has been the main paradigm of translation studies, but it might help illustrate general perspectives for other areas including science, a topic that will be discussed in the last section.

At this level, the Polysystem theory opened the way for an entirely new approach of translation phenomena, placing emphasis on a different stage: the study of translation out of a purely linguistic analysis of shifts and the notion of equivalence (Munday, 2001), and at the same time inscribing the translated texts in the historical and literary systems of the target culture. The most notable implication of Even-Zohar's polysystem theory is probably that literature "comes to be viewed not just as a collection of texts, but more broadly as a set of factors governing the production, promotion and reception of these texts" (Shuttleworth & Cowie, 1997, p. 196). Correspondingly, regarding science as a cultural product, scientific and technical texts can be described in terms of those factors affecting the conception, production and reception of texts, translations or adaptations, as it is analyzed subsequently in the next chapter.

### **2.1.1.2. Descriptive Translation Studies: A Door to the Concept of Assumed Translation**

Some theorists including recognized scholars such as André Lefevere and Susan Bassnett (1998), introduced dynamic, culturally oriented approaches which held sway for the next years. Working with Even-Zohar, Gideon Toury focuses on developing a general Theory of Translation (Munday, 2001). His groundbreaking Descriptive Translation Studies focused on the target to identify the patterns of behavior, building the norms inherent to the translation process; this effort outstands the previous translation traditions trying to diminish the tension for finding universal standards for a specific phenomenon, fostering the view that phenomena are influenced by the observer; this is by means of an analysis in which the text is situated within the target culture system, then a textual analysis is undertaken, leading to the identification of translation shifts, and finally identifying the patterns which help to reconstruct the process of translation (Munday, 2011).

The purpose of Toury (1995) with this type of study is to show that a body of texts considered as translations (based on the premise that everything that occurs in certain time as a translation is a translation) is conditioned by the target culture, as this is the driving force behind the translation process.

In this vein, translations regarded as objects of study, belong to a single system: that of the target language. The purpose of descriptive translation studies is not focused on translations themselves but their role in the socio-cultural target situation. This is not a study of the texts, but contexts (Holmes, 1999). It is right here where notions such as acceptability, coupled pairs and equivalence relations, understood as relational and

functional concepts, all these seen from the context of language and the target culture elements emerge. Stating “analysis of the text” within the descriptive translation studies framework cannot be misinterpreted as a source-text analysis as expected in structuralist and linguistic approaches.

This methodology attempts to develop a practical analysis of a text, situating it within the target culture system, looking at its significance or acceptability. Then, after this previous task, a comparison is undertaken trying to identify some relationships such as coupled pairs of target solutions (“replacing” segments) to source problems (“replaced” segments), and attempting some generalizations about the underlying concept of translation. Finally, the methodology draws some implications for future considerations in translation (Toury, 1995).

After Toury’s remarkable methodology and conceptualizations, translation is seen as a product, process and function; this is, a threefold series of relationships that exert specific influences in a particular direction. There is a wide criticism about this approach pointing out the ideological neutrality and the little stress on power relations of translation (Weissbrood, 2008). Even more, the limitations talk about the scope constrained to literary translation, while there is a variety of areas in which translation plays a central role. Again, this theory does not presuppose a literary context per se, even though the references and examples belong to literature. There is a particular interest in current trends to expand the scope of description to other areas different from literature, a perspective analyzed briefly in the first chapter, as some authors and models have started to see the invisibility of non-literary texts.

If polysystem theory paved the way for Toury's subsequent work on Descriptive translation studies, this last has opened up new paths and expanded the horizon to direct the study and theorizing about the translation from an empirical point of view; expanding the concept of translation, we are conferring more power and relevance on translators and their agency. This generosity -of a broader conceptualization of translation- after the prominent Descriptive Translation Studies presents a broader sense of the term acknowledging forms of translation practices different from those proposed by a prescriptive purview (Tymozcko, 2007).

Setting out the definition of translation proposed by Toury, there is a wide concept that plays a central role in the opening of new perspective in translation Studies: assumed translation. Descriptive studies consider "all texts assumed as translation by the target culture as its legitimate objects of study, broadening the scope of translation studies to include pseudo translations or concealed translations, which offer valuable data about a culture's perception of and expectations from translation" (Tahir, 2012, pp. 136). This overtly descriptive methodology including a wider scope of translations and the conjunction of operational norms that bring about the study of extratextual materials led to an increased interest in historical case studies of translation.

We could say that Toury (1995) rather than defining an "a priori" object of study, proposed an attempt to study the phenomena that are assumed to represent it. All the interdependencies that might have built the regularities which mark the relationships assumed can be obtained establishing a link between function, product and process; not only for individual cases, but also towards even higher generalizations. In this vein, Toury considered a translation:

regarded as any target-culture text for which there are reasons to tentatively posit the existence of another text, in another culture and language, from which it was presumably derived by transfer operations and to which it is now tied by certain relationships, some of which may be regarded -within the culture in question - as necessary and/ or sufficient (Toury, 1995, pp. 35).

This concept is precisely what allows the selected corpus in this investigation to be articulated as translations, regardless of whether a one-to-one relationship between texts and a fixed original is established; alternatively, this concept might help to investigate whether the texts that constitute this corpus are actually considered translations in the target language.

In his work, Toury proposed a new view, trying to delimitate the category in which assumed translations are inscribed. This concept has been widely accepted as an appropriate way to encompass the different semantic variations in the concept of translation, making it an adequate tool for historical research based on the widely disseminated “utterances which are presented or regarded as [translations] within the target culture” (Toury, 1995, pp. 32). Thus, the notion of “translation” is unstable varying semantically over time and space, and it is not independent because it is subjected to adjacent concepts, such as writing, speech, text transformation, and some others. All this new apparent semantic “instability” brings about very valuable insights to the necessity of studying different conceptions of translations in other areas. As we shall state in the following chapter, not only might translations in the traditional viewpoint be considered, but other forms not previously regarded as translations, such as adaptations, reinterpretations.

Theo Hermans (1999) presents the approach to Descriptive Translation Studies DTS summarizing the contributions, authors and theories proposed within this frame, stating a critical point of view of its strengths and weaknesses. Following this new paradigm, and considering the issues posed by Toury and then by Hermans, some important implications in the study of translation and some fundamental principles for this research are summarized as follows:

Firstly, Literature is considered as frame of reference and as a dynamic system of cultures (Hermans, 1999). Some authors have criticized the literature focus which interacts with other systems and translation comes to play a key role in this network connections. Hermans approaches the question on the paradigm of literature within the translation discourse, stating that the theory developed by Toury does not presuppose a literary context, but all references or examples of *Descriptive Translation Studies and Beyond* belong to the literary field. In addition to the reference to Toury, Hermans (1999) emphasizes the statement by Victor Schklovsky in which literary texts only obey stylistic devices designed to prevent the usual understanding of language and the world. We can here highlight the point previously stated in which Hermans understands literature as a dynamic system understanding theory through the vision of the world.

Secondly, in the essay entitled *La Traduction et ses discours* (1989), Berman argues that translation studies do not constitute a scientific nor literary discourse, and it is not its objective to substitute linguistics, or semiotics, or comparative literature. It is comparable to the critical discourse that literature has constructed around itself. There is not a global or a unified theory because every tradition involves a different sense. It also becomes clear that literature has been conservatively the object of study of translation studies trying to be and exist without a prescriptivist linguistics.

Thirdly, this approach is target-oriented; this is, translations are products of the target culture; Hermans (1999) is in part against this exclusiveness of the target system; to overcome this issue, St-Pierre (2007) proposes an emphasis not on the target-culture, but in the transfer phenomena, central in this discussion.

Finally, translation is a regulated activity. Because DTS involve studies on translation within specific historic and cultural contexts, translation must be considered a regulated. Following the definition of norms proposed by Toury. The descriptive theory introduces the concept of norms which determine the nature and practice of translation relating it to a time-period and a particular context.

### **2.1.2. Paratexts, Authors, and Translators as Key Elements of Contextualized Studies of Translation**

In this research, the concepts of paratexts and agents help in the construction of the methodology, the selection of the corpus, the mapping of relationships surrounding the process of translation; paratexts give voice to the agents, and agents build the paratextual elements that give life to the study of the phenomena of transfer, so it is necessary to point out some theoretical elements that lead to the definition of those concepts.

Following the descriptive and cultural perspective of translation studies, and the notion of assumed translation, our object of inquiry can be placed on the historical focus on assumed translations or on the interaction between translation and cultures. Both, the settings where translation appears and the consideration of the transfer techniques are advantageous to the study of history (D'hulst, 2012). Thus, in this translation analysis not only is the textual production considered, but also its acceptance in a historical context and

its relationship with other criteria, different from text production, such as context, agency, and impact.

In order to understand the genesis of the notion of paratexts, it is necessary to precise the phenomena involved when translating. Previously, we expanded our semantic conception of translation thinking of its largest cross-cultural and cross-temporal sense (Tymozcko, 2007). Consequently, if we consider this semantic empowerment as a key step towards uncovering the different interaction layers that surround the concept, it is mandatory to separate all the elements that build up the concept.

The descriptive approach as pointed out, places emphasis on products (textual study), and the result of the specific translation (analysis of the process) which performs a specific function in the context (Toury, 1995). In the first plane, as traditionally studied in defining translation, we must consider the textual layer<sup>4</sup>:

A text is ... a multidimensional space in which a variety of writings, none of them original, blend and clash. The text is a tissue of quotations ... The writer can only imitate a gesture that is always anterior, never original. His only power is to mix writings, to counter the ones with the others, in such a way as never to rest on any one of them (Barthes, 1977).

Trying to cross the linear dimension of text analysis, in which a text has to be studied on its own, Genette (1992) expanded the study of a particular text with other texts giving transcendence to the term “transtextuality”. The broad term “transtextuality” indicates the several ways a posterior text prompts readers to read or evoke an earlier one. To draw vectors, relationships, associations between the texts by which the transfer and mobility is given, it is necessary to draw a map of the transtextual relationships to elucidate

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<sup>4</sup> The purpose of this analysis is not to evaluate the textual framework, but it is necessary to define the posterior concepts because it is a space of multiple dimensions that allows the others layers to be uncovered.



all connections between texts. Transtextuality<sup>5</sup> after Genette (1992) is conceived as a set of implicit or explicit connections that are linked to a particular text<sup>6</sup>.

Despite the different categories of his study, it is precisely the term Paratextuality which covers the relation of a text to other connected or separated texts (Mirenayat, 2015). Over the latter half of the twentieth century, going beyond the bounds of purely linguistic and literary study, many scholars were concerned with the cultural implications of paratexts, its cultural significance and political, ideological and commercial power (Tahir, 2002). Then, considering the interest of a contextualized study in this investigation and parallel to the interest on assumed translations, in which Toury expanded the concept of translation, specifically a target-oriented concept (Tahir, 2002), paratexts appear on the ground of the target culture and turn the hierarchy of translation as initiated in the target culture.

Using an image of layers protecting the texts (or specifically translations), paratexts reveal gradually the essence of the interior (Pellat, 2013); paratexts evidence, explain, define, support or simply add background information of the universe surrounding the translation. This material is not necessarily textual, verbal or explicit. According to Genette (1992), it can reveal some aspects about the reception of the text but not about the transformation of the text, an issue that is discussed by Sehnaz Tahir (2002). She criticizes Genette's understanding of the text as an immobile or static object, as it fails to confer a dialogic relationship to the layers of texts. In this sense, paratexts might reveal valuable

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<sup>5</sup> Conceived from Genette (1997) theorization, transtextuality involves different types of relationships: intertextuality considered as the relationship between two or several texts that is manifested in quoting or alluding; paratextuality as the relationship between a text and its paratexts; metatextuality referring to commentaries; hypertextuality connecting the hypertext and the hypotext; and architextuality, placing the text within a spectrum of genres.

<sup>6</sup> These relationships, the networks are not going to be mapped in this frame. However, it is important to delimitate the concepts that surround the notion of paratext, central in this discussion.

information about the reception of the text, and also about other interconnections such as the presentation of the translated texts, the authorship of the text.

Correspondingly, paratexts can help trace the vectors that surround the vast universe of a text, that can be directed by editors, translators, and all those involved in the translation process as are the covers, titles, notes, prologues, epilogues, glossaries, images, among others, whose pragmatic force is derived from the paratextual idea that every element also has a force that is not explicit and can help rebuild much of the interests of the culture of translation, but also of the original work. As it is going to be analyzed in Chapter 3, paratexts play a central role in creating connections and distinctions between all the elements involved in the transfer process.

In a Benjaminian<sup>7</sup> sense of survival, Paratextual resources allow the value of a determined author and a given work to be build beforehand. There are a number of social transactions that are woven to reflect on the works, translated texts, reflect on the textual representations constructed over a culture, and that give an insight into how editors and translators see translation.

Congruently, several authors in the history of translation have adopted the categories proposed by Genette. According to Tahir Gürçağlar (2002), studying paratexts has obtained an important role in translation studies because they explore the social and cultural contexts that produce and receive translations. Some elements such as forewords, afterwords, titles, illustrations, dedications which are intended to mediate between text and

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<sup>7</sup> Walter Benjamin proposed a central concept in his theory of translation in which translation participates in the survival of the original text, giving it a position “afterlife”:  
 “The history of the great works of art tells us about their antecedents, their realization in the age of the artist, their potentially eternal afterlife in succeeding generations. Where this last manifests itself, it is called fame. Translations that are more than transmissions of subject matter come into being when in the course of its survival a work has reached the age of its fame” (Benjamin, 2000, p.2).

reader, and presenting the text, become primary sources for further understanding of the texts. The paratextual elements present in the adoption and translation of building codes in Colombia will be described and analyzed in chapter 3, trying to identify those relations that underlie beyond the written or explicit material.

Similarly, paratexts not only reveal or establish textual connections, but can help to articulate the concept of agency of individuals involved in the process. Regarding this particular turn to the individuals or subjects, it is important to talk about the authors and translators. As Andrea Pagni (2011) noted, the translator is not primarily a subject who makes individual choices, but is spokesman for a group that has developed a system of representations. The analysis of these elements would note ideological elements, discursive transversalities connected with their social and cultural contexts.

It is difficult to precise the question about the authorship of a text. Several scholars have pointed out the limits of authorship when referring to translation. Roland Barthes in his known essay "The Death of the Author" (1977) gives privilege to the authority of the reader and probably the voice of the multiple readers, including translators, "to write is to reach, through a preexisting impersonality" (Barthes, 1977, p. 3); similarly, Foucault (1969) in his essay "What is an author" begins by quoting Samuel Beckett, who wrote, "What does it matter who is speaking?" and in "the order of the discourse" states that "The author is what gives the disturbing language of fiction its unities, its nodes of coherence, its insertion of real" (1998, p.205), multiplying the discursive category of author. Both statements point a reaction against formal readings and the immanent presence of an author in literature, particularly. "All discourses are objects of appropriation" (Foucault, 1998, p.211).

Under these circumstances, not only the author is challenged by different assumptions in translation discourses, but the translator, seen in the traditional view of the

word, has to overcome the difficulties of being “absent” in most cases. Paratexts, in the sense of Gennete can provide valuable information about the translator, but if this information is omitted can reveal an intentional anonymity as a precautionary measure, as a literary strategy (Tahir, 2002).

Taking into consideration this subchapter, paratexts shall be analyzed in the following chapter considering the remarks developed by Sehnaz Tahir. Authors and translators shall be observed through the definition of agents developed afterwards.

### **2.1.3. Cultural Transfer as a Knowledge Builder**

The notion of assumed translation is absolutely valuable but offers a restricted perception of the techniques and process to integrate materials into the target culture, so it is necessary to incorporate as many features of these processes as possible. D’hulst (2012) proposes a concept to embrace all the interactions that may occur:

Clearly, one way to overcome the limitations of the “source/target” thinking underlying the concept “translation” is to use an umbrella concept that encompasses more techniques; this may be called “assumed transfer” insofar it applies to all features presented or regarded as transfer features within a given cultural setting.

(D’hulst, 2012, p.141)

Many discursive authorities participate in the textual and contextual forms of a text. So the author (author-translator) can be constructed through linguistic transfer. And it is precisely this broad term “transfer” in which some great developments emerge. So we need to differentiate this term from the transfer derived from the polysystem approach and the general conception of text transfer used in translation in which transfer is, “understood as

the simple moving of inscribed material from one place and time to another place and time” (Pym, 2004, pp. 13).

Moving to our concept of interest, Lieven D’hulst (2012) deeply rooted his work in the assumed translation derived from Toury’s concept and used an umbrella concept to incorporate more techniques to translation research; this is assumed transfer in which the concept of transfer can be applied to study all the features related to translation; this is, a concept that encompasses the cultural exchange process, including verbal and others that are not labelled explicitly and that could trace the historical evolution of these features.

Cultural transfer is an emerging concept in the human sciences, particularly in history, which has not been sufficiently deepened in translation. This is understood as the phenomenon that describes the displacement of a cultural object, following a chronological or spatial line affected by different displacement vectors, twists, and reinterpretations/recontextualizations involved in this movement (Espagne, 1985).

D’hulst (2012) imports the concept developed by Espagne (1985) also recovering the concept of "Assumed translation" developed by Toury, where the transfer is a concept that can combine several types of relationships. So to D’Hulst, cultural transfer is an ongoing process that can occur in various directions and from various dimensions; firstly, there must be a source and a target pole (producers, consumers, institutions, language communities, cultural spheres). Secondly, it applies to products (books or texts, ideas, attitudes, worldviews, etc.). Thirdly, it considers the agents or mediators manipulating these products (translators, critics, historians, etc.). Fourthly, it studies the different linguistic carriers (graphic, oral, electronic). Procedures or techniques are also part of this process (D’Hulst, 2012). In this investigation, as previously mentioned, we study the translation

process from the idea of transfer considering as many features of this concept as possible to understand the phenomena of translation.

In this point, it is necessary to introduce the concept of mobility which refers to the dynamic force that allows the transfer to be possible. No matter what the source of knowledge is, all the movements required to cross linguistic and cultural boundaries become a force that favors the translation and translation in turn expands the idea of mobility (Montgomery, 2000). But as a traditional trade process, recalling Pym, it needs to be set in a time and space interval (Pym, 2010).

All the concepts articulated in this sequence might help to define the object of study of our research. After this general exploration, semantic developments on the word “translation”, the concept of assumed translation, the cultural transfer phenomena, and the notion of paratexts shall be identified and illustrated in the following chapter.

## **2.2 Some Methodological Considerations**

### **2.2.1. General Methodology**

This research is a single case study, which strives for descriptive methods rather than statistical generalization. The results of the case study are limited to the context of the adoption of a Colombian building code, illustrating moderately specific elements of the theory. As an empirical research, seeking for evidence derived from data and experimental work (Chesterman, 2002) and contextual research, observing the circumstances surrounding the production of the text (Saldanha, 2013), it involves a descriptive analysis that requires qualitative methods and a variety of sources: documentary exploration, paratextual material observation, description and analysis of the material, literature review,

interviews.<sup>8</sup> Also, it includes a socio-cultural perspective considering agents and institutions involved in translation, adaptation and processes.

Empirical research, on the other hand, seeks new data, new information derived from the observation of data and from experimental work; it seeks evidence which supports or disconfirms hypotheses or generates new ones.

### **2.2.2. Some methodological elements for history, case studies, agents.**

A descriptive and socio-cultural perspective such as that adopted for this investigation requires the construction of a methodological framework in which translation is articulated to study its context of production and reception.

Previously, as we stated above, history of translation was limited in space and time, and restricted to a geographical focus; this is an attempt to define some “periodizations of translation” such as those developed by Steiner or Chesterman (Wakayabashi, 2012), but they are specific to a translation tradition and might be arbitrary constructs as well. Recent developments have turned the scope to translators, translator’s history, non-western cultures, or other historical traditions that are under-represented in historical research (Wakayabashi, 2012). This point insinuates different space and time frames giving relevance to different interactions of long-term, midterm and short-term periods in translation history. Henceforth, we are interested in giving a historical perspective (Santoyo, 2006; Montoya, 2012) to this research, it somehow has to do with how translation played a central role in developing a building code in the recent history of engineering in Colombia. Parallel to this new emphasis, some other trends have emerged

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<sup>8</sup> In this investigation, the interview was not a controlled instrument or a part of the corpus. Some valuable insights and clues were collected from personal communication.

such specialized histories, women as translators, non-scientific texts, alternative texts, and theories derived from history. Such as Tymozcko stated: “even with a particular situation, history is not monolithic. A country or a people does not have one single history” (Tymozcko, 2007, p. 202). The author and others who recognize the importance of studying history, say ignoring the heterogeneity of a particular case is erasing it; so it is from the description of particular events, we are avoiding dominant views on history and translation.

Pym criticizes the lack of comparability and representativeness of translation history (Pym, 2012), while D’hulst instead proposes a methodology to study translation history and overcome the problems posed by the critics. After defining the limitations and central concepts, such as time, space, format, metalanguage, the historian can answer more concrete questions related to a particular work (D’hulst, 2011 ).

In this point, D’hulst differentiates methodological questions to solve the gap between history and historiography:

History is the proper sequence of facts, events, ideas, discourses, etc. (“*res gestae*”). By extension, history is also understood as the “*historia rerum gestarum*”, an oral or written mode of presentation of these facts, events, etc.; a strong tradition favors a narrative mode of presentation. Historiography, in its traditional sense, is defined as the history of histories, i.e., the history of the practices of history-writing. By extension, it is also understood as the history of other intellectual practices such as linguistics, philosophy, literature, science, etc. In this sense, historiography has developed into a mode of scholarly activity that combines historical concepts and methods and the specific expertise that belongs to the intellectual domain under study (D’hulst, 2011. pp. 398).

Meanwhile, Pym (1998) has pointed out the need to study the history of translation without differentiating, placing an emphasis on history, drawing attention to the transformations related to the notion of translation:



Translation history ('historiography' is a less pretty term for the same thing) is a set of discourses predicating the changes that have occurred or have actively been prevented in the field of translation. Its field includes actions and agents leading to translations (or non-translations), the effects of translations (or non-translations), theories about translation, and a long etcetera of causally related phenomena (p. 5).

Although D'hulst's approach seems to contain an interesting methodological proposal combining historical concept and methods, Pym includes both the work of interpretation of events and the discourse that emerges within this process, giving to this proposal an accurate definition.

Using this conceptual standpoint, it might be noticed that researchers are constrained by several limitations and accused of subjectivity and anecdotal evidence but the time-space situation confers the objective constrain, integrating the subjective observation into the historical framework. Wakayabashi (2012) in her account of history and quoting the essay by Ginzburg "Microhistory: Two or three things that I know about it" argues that researchers in search for the truth and facing different limitations can be involved in excessively theoretical abstraction, but all these evidences, which can be easier to prove or refute, constitute the narrative discourse proper to history. It is precisely the lack of representativeness a weak point according to some critics, but it is not definitely the objective of microhistory.

Nonetheless, there are several methodological issues regarding translation history that need to be precised. The tension between universally applicable concepts and particularistic approaches is still visible. There are some key similarities in studying specific details in a geographic context but there are some local realities that cause variations in the nature and timing of these traditions (Wakayabashi, 2007; Tahir, 2002). To

sum up, the homogenizing and West-centered metalanguage of history also poses a problematic struggle forcing researchers to face two opposed dimensions: firstly, a possible stress on universalizing translation features and, secondly, an attempt to essentialize local differences, and at the same time point out they are unique. Also, a tension to create a universal periodization, and overemphasis on institutional translation history linking the research inevitably to and underlying ideological context. (Wakayabashi, 2007, Tahir, 2002). All these issues can bring about more criticism to the historiography methodology, obscure differences, misinterpret phenomena, and some other adverse consequences obstructing the conception of a strong and unified methodology for history.

Trying to overcome the operational gaps, several historians and researchers based their investigations on the methodology proposed in the Descriptive Translation Studies approach supplementing the analytical rigor of this approach with tools and concepts borrowed from sociology, history and ethnography (Tahir, 2012), conferring a more eclectic and flexible framework. This is widely known as the sociological turn in which the joining forces of sociologists and historians result in a scaffolding comprising networks of agents and agencies, the interplay of their power relations, the social discursive practices around the translation process and the effects they produce in the strategies adopted when translating (Wolf, 2010).

In a similar vein, following the opposite direction of criticism and giving a new focus to the inadequacy of the widespread Map diagramed by Holmes, Chesterman tries to re-map it including some missing elements predominantly converging in translation history. Before including new subcategories, Chesterman unveils the most remarkable critics to the map, such as the absence of historical research, the scarcity of contextual and pragmatic factors, the lack of interdisciplinarity, and some other distinctions that are out of date

(Chesterman, 2009). It can be noticed that Chesterman considered several branches regarding cultural studies (including ideologies, traditions, idiosyncrasies), cognitive studies (which are growing in parallel with the incorporation of technology), and the sociological studies (including networks, agents, status, and so on).

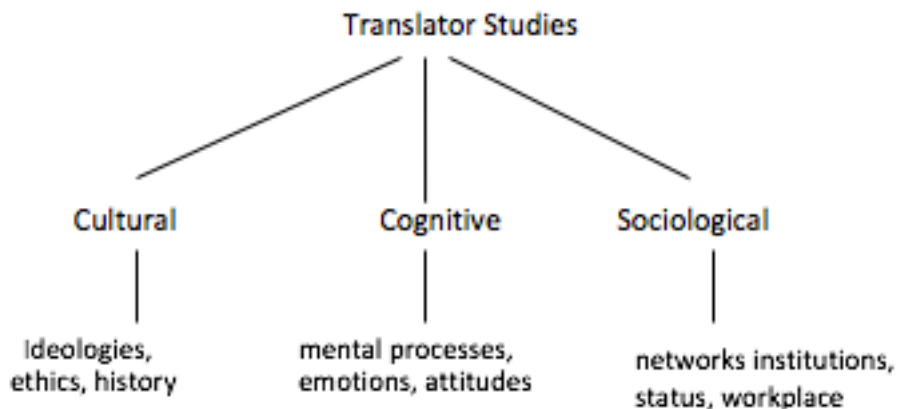


Figure 1. Sketch of Translator Studies. Chesterman, 2009.

Our object of inquiry, of course, is not the focus on the text, but the universe surrounding it. Chesterman (2009) suggests that this “recently” emerging trend comprises three strands: the sociology of translations; the sociology of translators; and the sociology of translating. He argues that Holmes just insinuated the first strand. But the proposal of Chesterman does not neglect the value of the map but claims the lack of human interaction considering the different branches:

The sociology of translators covers such issues as the status of (different kinds of) translators in different cultures, rates of pay, working conditions, role models and the translator’s habitus, professional organizations, accreditation systems, translators’ networks, copyright, and so on. Questions of a different kind under this heading are those relating to gender and sexual orientation, and to power relations, and how these factors affect a translator’s work and attitudes. The sociology of translators also covers

the public discourse of translation, i.e. evidence of the public image of the translator's profession, as seen e.g. in the press, or in literary works in which one of the central characters is a translator or interpreter (Chesterman, 2009, p. 16).

Gradually, derived from the work of different scholars the belief that any translation is necessarily bound up within social contexts was firmly accepted. All the act of translation regarding the different stages (the selection, production and distribution of translation) that it might involve, is carried out by individuals inscribed in a social system; also, the strategies adopted when translating are inherently a human activity (Wolf, 2010).

The emphasis on translators' textual power or the emergence of the figure of a translator as a dynamic agent is growing interest in a number of studies. The concept of agency in translation is related with different functions and conditions, not always close to the text; this is, all the agents involved in the transfer process do not have the same hierarchy and "textual presence" in the process (Paloposki, 2009). Different efforts have been stated to avoid the biographical impulse when studying the agents, trying to confer them an instrumental role, relevant to the study of transfer:

The study of translational agency may make use of different sets of data. The studies listed above use, variously, translations, different kinds of paratexts, and biographical sources. Kaisa Koskinen (2000: 99), in her treatment of translation ethics, introduces a useful distinction between textual, paratextual and extratextual visibility. This categorization can also be applied to agency, and consequently to the data used in the study of agency. Textual agency would refer to the translators' voice in the text, to her/his footprints, so to speak, be they deliberate manipulation, stylistic preferences or habits (Paloposki, 2009, p. 191).

From this optic, Translation is not only used to disseminate existing knowledge, but to create new knowledge, revealing at some extent its disregarded ideological dimension

(Wolf, 2010). The voice, the manipulation, the visibility are some terms previously remarked which reassert this statement. It is necessary, nowadays, a theory of power and ideology to supplement the agency of translators. This theorization must address different contemporary factors, such as economic and social issues including control in the broad sense of the world, phenomena related to informational networking, as well as insights from sociology and political science (Tymozcko, 2007).

Again, after all this travel, in this research, we are appealing again to the proposal of analysis of cultural transfer developed by D'hulst (2012) embracing the assumed translation by Toury and clearly influenced by sociological developments. All this framed by the remarkable Descriptive Translation Studies which are constantly growing and still in motion.

D'hulst (2010) proposes a methodology in which all the steps we have analyzed are covered. In order to give coherence and rigor to the study of transfer in the frame of history, it is mandatory to delimit a time and place frame. Previous analysis indicated the instability of some studies regarding the spatial and temporal selection, but, of course, this can be challenged by a proper selection of this two-dimension scenario. This interval must provide enough evidence to support the transfer process. After selecting these frames, it might be necessary to analyze all the observable features and their possible interconnections of agents and the other study objects. Then, the less conspicuous features can be studied trying to elucidate the transfer elements they might contain. Some hypothesis can be formulated extending the scope of the inquiry and placing specific emphasis on the questions about the transfer itself.

### 2.2.2.1 Corpus and data selection

According to Tymoczko (2007), the interdependence between data and theory is essential. In order to explore the concepts of assumed translation and transfer, it is necessary to collect appropriate data from the available sources. This is the translation archaeology proposed by Pym (1998) which “is concerned with answering all or part of the complex question of who translated what, how, where, when, for whom and with what effect.” (Pym, 1998, p. 5). In order to solve these questions, various methods can be implemented: literature review, interviews, documentary exploration. Mainly our data were taken from paratextual materials and information about agents. After an analysis of the available material, the SEAOC-1974, ACI 318-77, ATC-3 codes and their correspondent translations and adaptations, allowing certain choices to be supported through paratexts.

Source Text	Spanish version
Recommended Lateral force requirement and commentary. SEAOC-1974	Recomendaciones de requisitos para fuerzas horizontales. AIS. 1976
ACI-318 77	Código de las construcciones de concreto reforzado AIS-318-77  Title C-NSR-10
ATC-3 (1977)	Disposiciones tentativas para desarrollar códigos sísmicos ATC-3  AIS-100  AIS-150-86  Decreto 1400-1984

Table 1. Correlation of texts. Source texts, translations, adaptations and inspirations.

### **2.2.2.2 Paratextual material observation**

Since paratexts give much information about the translation and its reception (Pym, 1998), and based on Genette definition, we are going to focus our investigation on peritexts (comments, prefaces) and epitexts (materials supplied by publishers, editors, printers). Then, in chapter 3, the prefaces, covers, back covers, images, are going to be analyzed.

### **2.2.2.3 Agents**

As a contextualized investigation, it includes a socio-cultural perspective considering agents and institutions involved in all the process. Agents play a central role being in and intermediary position in the process (Milton, 2009). After the literature review and the corpus selection, some of the agents involved in the investigation can be identified; the number of translators involved, some biographical information, the institutions and other elements of a similar nature might reveal valuable information about the process. The identification of both agents and institutions allowed the reconstruction of some parts of the contextualization.

## **2. 2. 3 Stages of investigation**

### **2.2.3.1 First stage**

The first stage involves the collection of codes, manuals and translation of civil engineering that were developed or published in the country between 1970 and 1990.

This time frame is mandatory because before it, there were no evident translation relations in this regard and is obvious, because as D'hulst points out:

The first is obvious: a time and place must be delimited, by establishing a corpus that offers enough material evidence of transfer having occurred (through the visibility of transfer agents, transfer techniques, the effects of transfer within the target culture, and so on) (D'hulst, 2010, p. 143)

At this stage, about six codes were selected; while the material was examined, those containing no graphic elements, intertextual relationships, and additional information material were discarded; actually, we ended up with a group of three main texts, because original and the Spanish versions were available and some significant relationship could be described. They were chosen taking into account the level of influence on subsequent codes and also the paratextual content. It is necessary to point out that we could not find the AIS-100 version.

This information is the main body of this research. In order to achieve this, literature review, documentary exploration, and interviews that account for the existence of certain material are developed. Those elements containing paratextual material suitable for the analysis are considered. The information is registered in Word processor. The foregoing questions developed by Pym (1998) are observed. Approximately 20 paratexts including covers, footnotes, introductions, opening information, forewords, were found.

### **2.2.3.1 Second stage**

In the second stage, an instrument to record paratextual elements found in each of the texts and analyzed in the light of socio-historical context is used; key moments such as the earthquake, the enactment of the law were considered.

It should be noted that the primary sources are the translations, but secondary sources as paratextual material is fundamental for the contextualization. According to D'hulst: "The



second step consists in analysing the features that are most accessible to observation and their interrelations, taking into account the specific configurations of agents and techniques of which the transfer features form part” (D’hulst, 2010, p. 143)

All the visible relations and the notable interpretations are central in this stage.

D’hulst proposes a third step, that is going to be combined with this stage. Finally, the impact of the findings in light of the pedagogical, social and cultural functions which may involve all transfer relationships is determined.

With all the information obtained, with the available material, personal communications with the engineer Luis García, presented in the section about agents, we were able to determine certain parameters. Unfortunately, not much information is found, these characters remain hidden from public view in the history of science. However, we could develop a general reconstruction of these profiles.

In order to delimit the space of transfer, its components are then determined: source and target contexts, the study of agents or vectors, the motivations that lead to the cultures to make such transfers, and strategies used to achieve this appropriation. From this perspective relating it to translation, it is assumed that effectively through translation something is transferred and such transfer is not neutral but undergoes transformations, recontextualizations according to the needs and values of the target culture. What we want particularly to emphasize in this research is that texts are effectively transferred, but the processes also carry over models and behaviors.

In this chapter we developed an overview of different methodological approaches in history of translation in order to define the methodological interest of this research. Evidently, following the theoretical standpoint, D’hulst provides the most suitable methodology to conceive the selected texts as translations and analyze the phenomena of

cultural transfer. Generally, we can conclude that research in translation history considers this activity as characteristic of the dynamics of societies. This perspective allows the study of agents, parallel texts, and translations discourses.

### **Chapter 3.**

#### **Description and Analysis of Translations: Cultural transfer and paratextuality**

Throughout modern history of engineering, countries around the world have focused on developing policies, standards and regulations concerning the safety and welfare of the public; processes of regulations have increasingly been influenced by other countries or institutions through the ongoing integration of participants or agents directly involved. Latin American countries have first started borrowing policies from European countries and United States to establish modern engineering schools and curricula (Poveda, 1993). It is not the purpose of this chapter to enter the arena of the general policy-making issues, but some of the specific developments that must be recognized in addressing the specific problem of translation of engineering regulations.

The Chapter is divided into five sections. The first provides the definitions required to select the corpus. The second subsection traces a historical path through the most important influences to identify the corpus. The third centers on agents and institutions involved in translation, adaptation and processes of building codes. Subsections 4 and 5 are directly related to translation tasks. Specifically, subsection 4 refers to the strategies undertaken by engineers and translators trying to elucidate if any important structural or another action was implemented within the translation process, and subsection 5 refers to paratexts, term used to the set of statements that complement the main text of a work, such as the title, subtitle, preface, table of contents, and are considered as thresholds to all the practices related to transmission of knowledge, precisely integrating factors mentioned in the previous chapters.

### 3.1 General Characterization of the works

Since ancient times, some civilizations have used regulations or building codes to regulate the implementation of its buildings. Many of these civilizations could be traced by erected buildings that remained as an evidence. Among the archaeological finds from ancient times, the Code of Hammurabi, a basalt stele erected by King Hammurabi of Babylon (1792-1750 BC), is a remarkable finding. Two Sumerian legal documents precede the Code of Hammurabi; however, the latter is the most important ancient Near Eastern legal compendium. It is considered the earliest known set of legal documents for regulatory purposes including penalties for faulty construction practices (Kumar & Leiva, 2010). In addition to its legal content, this work is also a unique source of information about society, religion, economics, and history of this period (André-Salvini, 2003). Its Law 229 provides:

Law § 229. If a builder has built a house for a man and has not made strong his work, and the house he built has fallen, and he has caused the death of the owner of the house, that builder shall be put to death.<sup>9</sup>

Laws 230 and 231 from the same code also establish regulations for others affected by the construction of the building (Hammurabai code, Translation, Johns, 2000).

Scientific and engineering regulations have enabled mankind to ward off catastrophes of many sorts. Traditions and experience have been inherited since ancient times, but it was industrial revolution which paved the way for the birth of social order and administration of laws (Tyree, 2007). Parallel to this organization, building construction practices were modified. Code developers banded together to build solid model building codes and to promote an ethical conscience. Thus, different institutions were founded

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<sup>9</sup> The Oldest Code of Laws in the World, by Hammurabi, King of Babylon, Translated by C. H. W. Johns. T & T 38, George Street, Edinburg, 1903.

around the world. Subsequent regulations over the years were developed, enacted, or adopted.

In general, the issue of building codes is divided into different types of documents and terminology sometimes vary for several institutional, local, and professional reasons, as listed below hierarchically:

- i. Building codes are a social contract; they define regionally or nationally acceptable risk for buildings, indicating what is permissible and what is not in legal terms. They also serve as a regulatory document aimed at protecting the Public's life, welfare in the building environment (Tyree, 2007). American Professor Hardy Cross (1895-1959), renowned engineer who achieved popularity in 1930 with the moment distribution method, said a building code is necessary "to protect us from fools and knaves"<sup>10</sup>(García, 2015). In Colombia, the 1991 Constitution limited the enacting of "codes" to the legislative area. Therefore, the term code used in 1984 for the Colombian Earthquake Resistant Building Code, Decree 1400 of 1984 and what has subsequently enacted under Law 400 of 1997 called "Regulations" was restricted. Noncompliance can result in being prosecuted.
- ii. Materials Standards can be defined as a set of technical definitions and guidelines functioning as instructions for designers, manufacturers, operators, or users of equipment. Several key initiatives after the industrial revolution laid the

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<sup>10</sup> This expression was paraphrased by engineer Luis García, and the exact source where Professor Hardy Cross was not found. So we are going to extract it from a Company bulletin in which this expression is remarked: "Building codes have been around for a long time. However, the rise of modern, widely enforced building codes is a 20th Century phenomenon. The famous civil engineer Hardy Cross was an early advocate of building codes. He is often quoted as saying that the building codes are necessary to protect us from fools and knaves. In short, building codes are required to help those who don't know what they are doing and to protect society from those who would compromise public safety". p.3  
Available at: <http://www.roaringbrook.com/newsletters/2009spring.pdf>

groundwork to create institutions such as the ASTM (American Society of Testing Materials), which develops the standards for materials in United States, remaining valid even in other countries (ASTM 1999). In Colombia they are called NTC (*Norma Técnica Colombiana*) [Colombian Technical Standard] and are issued by the ICONTEC. ICONTEC is the representative of the International Organization for Standardization (ISO) in Colombia.

- iii. Construction Specifications accurately describe the technical requirements of any given process; they are typically used by designers to clarify standards, procedures, and products used by a contractor to build a project (Burley, 1989). They can be also generic documents produced by institutions (García, personal communication, December, 2015). For reinforced concrete structures, a simple case is the ACI (American Concrete Institute) 301S-10 " Specifications for Structural Concrete".
- iv. Guides, Manuals and Aids are documents, generally used voluntarily to facilitate and assist the design process. They are produced by the same institutions that enacted or developed the codes and specifications, to facilitate and expand their use (García, Personal communication, December 2015).

It is important to note that, both codes and materials standards can contain mandatory and non-mandatory requirements and must be produced by committees through an open hearing and consensus process<sup>11</sup>; and the entire process and feedback should be

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<sup>11</sup> Due to the lack of papers published on the topic, some documents provided by the regulatory institutions might help in developing the characterization of the concepts. Standards.gov is a platform seeking to promote effective and consistent standards policies: <http://www.nist.gov/standardsgov/ombal19.cfm#3>.

appropriately documented<sup>12</sup>. This is required worldwide by ISO (International Organization for Standardization), AIS (*Asociación de Ingeniería Sísmica*), and Icontec (*Instituto Colombiano de Normas Técnicas y Certificación*), in the Colombian case. The ACI, for example in the United States is supervised by ANSI (American National Standard Building Code), which is the U.S. member body to ISO, as in Colombia Icontec is the national member body to ISO.

Considering the terminological nuances presented before and trying to establish a breakthrough point, it is important to identify the different foreign influences that contributed to local building code development. In Colombia before the 1970s, a number of international codes were used as a reference for building projects. Concerns about over-regulation and the need to unify criteria in different areas, parallel to the birth of some institutions such as the AIS (*Asociación de Ingeniería Sísmica*) [Colombian Association for Earthquake Engineering] marked the birth of a number of proposals leading to the local regulations<sup>13</sup>. There is little literature about institutional development of science and technology policy in Colombia (Nupia, 2014), but thanks to the constant work of different agents involved in the Colombian legislative process, it is possible to establish a map of ideas, texts, translations and agents that shed light on the process behind the Colombian law within the field of construction. There are formulations in all categories, from translations of codes, specifications, standards or simple manuals that were born as a critical response to the complexity of the regulations arising from the legislation.

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<sup>12</sup> Another institutional document provides a reliable source of information in this case, Using and referencing ISO and IEC standards for technical regulations. 13 NSR-10 preface, available at: <http://www.idrd.gov.co/sitio/idrd/sites/default/files/imagenes/9titulo-i-nsr-100.pdf>

The purpose of this work are the official and unofficial translations of foreign building codes, as well as the adoption of other foreign codes in national regulations, considered in chapters, titles, etc. The work of a "collective" formed by members from different origins influenced the technical publishing field in Colombia since the late 1970s, a vast work that exceeded the scope of our country, also offering a technical contribution to Latin American.

In the same vein as the historical facts, there is a particular interest in thinking about translation as a practice located in cultural terms, this is, as a purposeful process from the selection of texts, the work of adaptation, and distribution in certain areas; in other words, the end result is a product whose position and function are determined by the agents aiming at particular goals, considering the relationships and translations as facts of the culture which hosts them (Toury, 2004). More specifically, translation is a process that exceeds the linguistic act, contemplating other discursive and social practices that together construct a discursive field allowing editorial authorities to intervene in the publishing and cultural scene. Translation is, consequently, not a random choice, but allows names and texts to circulate under an editorial and idiosyncratic policy.

Tracing a historical sequence of external influences, in Colombia from the decade of the 20s of last century, the practice of civil engineering was influenced by external technical codes and standards, mostly American, such as AASHTO (American Association of State Highway and Transportation Officials), SEAOC (Structural Engineers Association of California), ACI (American Concrete Institute) and ATC (Applied Technology Council). In this context of knowledge transfer, it is essential to place emphasis on the importance of translation in the process of importing codes. As an object of study, some foreign codes unveiling the relationships presented above are selected; the SEAOC-1974, ACI 318-77, ATC-3 codes directly influenced the idea of a national legislation.



### 3.2 Characterization of translations

Adopting the concept of assumed translation developed by Toury (1995) described in the previous chapter, it is necessary to study exemplars that are taken to represent the phenomena or are conceived as translations in the target culture.

The development of codes is envisioned by the agents involved as part of an evolutionary process to improve the welfare and the building process. We want to highlight, particularly, the pioneering work of the Colombian engineers Alberto Sarria and Luis Enrique García (Pinzón, 2014) who, through personal communications decided to start around 1976, the annotated translation of the SEAOC-1974 code, which would be the genesis of an authorized translation in Spanish; the motivation, perhaps, lie on the academic experiences of the engineers and the lack of a local code; this subsequently would lead to the creation of a national code. This translation was a contribution to the Colombian Association for Earthquake Engineering, AIS, with Alberto Sarria, and Luis Enrique García, as leading members of this institution. Then in 1978, the now extinct institution known as ICPC (*Instituto colombiano del cemento*) [Colombian Institute of Cement Producers] translated<sup>14</sup> the ACI 318-77 code developed by the ACI. The original document entitled *Building Code Requirements for Reinforced Concrete, ACI 318-77* was first published in December 1977 by the ACI, developed by the 318 committee, led by Eugene P. Holland. This code is divided into 6 parts, 20 chapters and 6 appendices. It contains 103 pages. The work contains building materials, standards, performance requirements, limitations, and general provisions for building work. The translation of this code was

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<sup>14</sup> The ICPC translated the ACI-318-77 to Spanish under international supervision. It has a committee of three translators who were engineers belonging to this institution, and an advisory committee including renowned engineers and Luis E. García.

published by the ICPC, in 1978. Probably the promptness of publication may be due to the imminent need for regulation and the contact with the experts and authors of the original.

It is important to point out that the ACI, in this regard, has an extensive publication program granting licenses to translate and distributing publications in local languages as global need with a collaborative work including experts, volunteers and different verification mechanisms to disseminate information about concrete. There is an initial committee to the publication, a delegate who is fluent in both languages chosen by the vice president of ACI, a group that is interested in a particular publication and all designated technical team to carry out the translation, revision and necessary editing.<sup>15</sup>

Subsequently, the Applied Technology Council (ATC) published in 1978 the ATC-3 document, a manual for building standards, Provisions for the Development of Seismic Regulations for Buildings. In 1979, the AIS considered the ATC-3 document an important reference for developing a local code. The institution developed the translation and included a proposal to adjust the ATC-3 meeting the country needs. The published document was not the proper translation but such proposal was based on the ATC-3. Successively, almost manually and parallel, the creation of the Standard AIS-100-81<sup>16</sup> *Requisitos Sísmicos para Edificios* [seismic requirements for buildings] was undertaken, inspired by the previous document ATC-3. With funding from the Universidad de los Andes, the engineer Luis Enrique García traveled to Urbana-Champaign (Illinois) in 1980

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<sup>15</sup> For further information, see ACI document. ACI standardizes translation process of ACI documents fostering international participation. The document is annexed. “Translation of an ACI standard into a language other than English may be permitted and is considered an editorial change and no further balloting by the committee is required. In some cases, especially for ACI standards, it may be required to establish a task group or subcommittee to validate and approve the translation. For example, Subcommittee 318-S is responsible for the Spanish translation of ACI 318. The translated standard must be published with the translation disclaimer” (ACI, ACI Manual Technical Committee Manual, p. 26)

<sup>16</sup> We could not find any available copy of this material.

to work with prominent scholars from the University of Illinois, such as Nathan Newmark and Mete A. Sozen.

Thus, the first translation of the SEAOC-74 standard, the translation of the ACI 318-77 code, and the adaptation of the ATC-3 standard were among the pretexts, along with other versions of codes and events such as the earthquake that affected the southern city of Popayan in March 1983, leading the issuance of Law 1400 of 1984 which adopts the Colombian Earthquake Resistant Design and Construction Code (*Código Colombiano de Construcciones Sismo Resistentes*), CCCSR-84. The normative character of this code has been preserved in subsequent regulations revoking the first, leading to an official standard NSR (Colombian Earthquake Resistant Standards Regulation). This code, was updated by AIS-100- 97, a AIS 100 committee document, which became Law 400 of 1997, regulated by decrees 33 of 1998, 34 of 1999, 2809 of 2000 and 52 of 2002.

It is important to emphasize that the three selected materials are considered as translations conceiving the concept of assumed translation and regarding the relationships that can be built around the transfer process.

Following this initial work, the Colombian government enacted the AIS-100-83 as the mandatory earthquake resistant regulation. Subsequent Colombian Seismic Building Code NSR is almost an entirely production of permanent advisory commission commanded by the government, together with other institutions such as the AIS, but preserves certain direct influences, such as the official translation of the ACI-318-77 code. For instance, the original version of ACI code 1977 is the title of the NSR-98 standard, which refers specifically to reinforced concrete. This version is published by the AIS and consists of 2 volumes and 11 titles, including the aforementioned title C.

Versions of the Colombian regulations correspond to Decree 1400 of June 7, 1984; its first update was the NSR-98, Colombian Earthquake Resistant Design and Construction Norms, issued by Decree 33 of 9 January 1998 (Gómez & Farbiarz, 2005). The second update constitutes the NSR-10 (*Reglamento Colombiano de Normas Sismo Resistentes*), Building Regulation in Colombia Decree 926 issued on March 19, 2010.

### **3.3 Characterization of agents, authors, translators**

The notion of agent has been recently received special attention, perhaps, considering some major historical, literary and cultural transitions, in which agents have played a central role. According to Juan Sager, quoted by Milton & Bandia (2009), an agent is a person who is in an intermediate position between the translator and an end user of such translation. The concept includes text producers, and mediators such as abstract, editors, revisors and translators, commissioners and publishers, at the beginning and end of the speech act of translation (Milton & Bandia, 2009).

Renown engineers Eugene P.Holland, Nathan Newmark and Mete A. Sozen were among the participants in the dissemination of knowledge and offered an invaluable help in the construction of the Colombian standard. Other experts such as George Housner, an experienced engineer in structural dynamics also contributed to the process (García, 1984).

Eugene P. Holland is an American Civil Engineer. He was professor at the University of Illinois – Chicago for fourteen years, and he is a member of numerous professional and technical organizations. He was a member of the 318 committee and participated as an international collaborator in the ACI-318 code official translation into Spanish published by the ICPC.

Nathan Newmark (1910-1981) was a renowned American structural engineer, considered one of the fathers of the Earthquake Engineering, author of the book *Fundamentals of earthquake engineering*. He was in charge of the Department of Civil Engineering at the renowned University of Illinois, and received the National Medal of Science. After the publication of AIS-100-81, The Colombian engineer Luis Enrique Garcia, thanks to funding from the Universidad de los Andes, traveled to Urbana-Champaign to work with academics from the University of Illinois including Nathan Newmark, who had traveled to the University of the Andes in 1973 to conduct a seminar on earthquake engineering.

Mete A. Sozen is a Professor of structural engineering at Purdue University, Indiana, United States. He is a recognized structural engineer, notable for his many contributions to the development of codes and description of dynamic phenomena. His contributions include more than 130 technical papers. He was also a contributor during the visit of engineer García to the University of Illinois (García, 1984).

According to Milton, translation agents are "people who devote great amounts of energy, and even their own lives to the cause of foreign literature, author or literary school, translation, writing articles, teaching and dissemination" (Milton & Bandia, 2006, pp 1). In this regard, following the definition of Milton & Bandia, there are two fundamental characteristics of the agents of translation: firstly, agents can assume different identities in a given culture, and secondly, they can also play an intermediate role during the transfer process. Not only were the engineers involved in this huge task perceived as translators or engineers, but also noticed in their central role in setting up a key policy for the development of the code.

In their work about the figure of the diplomatic scientist in the twentieth century, Minor & Vargas address a case study of the profile of two scientists who exercised cultural diplomacy, connecting these agents rather than knowledge holders, as figures acting as point of convergence between disciplinary expectations and both local and international interests (Minor & Vargas, 2015). Accordingly, scientists from their epistemological stance mediating in the relationship network and certain historical contingency, adopt a new profile, showing the possible influence of science and translation in power relations. This is the case of Colombian engineers Luis Enrique Garcia and Alberto Sarria who participated actively in the achievement of various regulations, technical exchanges, unofficial translations, official translations, along with other engineers who were part of the committees of ICPC, AIS and NSR, creating a precedent of participation of different entities. This is, their scientific background along with their extensive work enabled them to establish a sound basis for interdisciplinary and transdisciplinary exchanges.

The engineer Luis Enrique Garcia Reyes is an active structural engineer and a professor at Universidad de los Andes. He is a member of ACI, ASCE (American Society of Civil Engineers), AIS, CRSI (Concrete Reinforcing Steel Institute), IABSE (International Association for Bridge and Structural Engineering), among others. He was Chairman of the Committee that drafted the first Colombian code, promulgated in 1984 after the Popayan earthquake in 1983. He has been a member of ACI 318 Committee and numerous committees developing other codes and standards. He was the first professional non-resident in the United States or Canada to be named president of ACI ad honorem for the period 2008-2009.

The engineer Alberto Sarria, (1934-2015) professor emeritus at the University of the Andes, was a visionary scholar, passionate about geophysics and seismology. He

pioneered studies of seismology in the country, promoting interest in earthquake engineering as an area of knowledge in various institutions in Colombia. Along with his research and intellectual production in terrestrial dynamics, geophysics and earthquake engineering, Professor Sarria made part of different translations and the establishment of regulations that helped shape the Colombian standards, through the Colombian Association for Earthquake Engineering, in which he was founder and first president.

In a particular analysis developed by Paul Bandia about the translation work of an erudite shaping the history of Africa using translation in the article “Translation at the Service of History”, Bandia states: “The dissemination of knowledge has never been an innocent activity is mediated by power relations” (Bandia, 2006, p. 210). In this case, an acclaimed translation of Einstein’s theory of relativity into Wolof, a Senegalese language, challenged those who marginalized African languages when expressing abstract scientific concepts. The Colombian case, was neither an innocent activity nor accidental. The work of these engineers as well as being an innovation for policies and regulations, presupposes a bridge between two cultures, two ways of thinking, two types of applied scientific knowledge. Such work may also offer some lessons about the operation of translation as an intellectual activity, in search of the dissemination of knowledge, the appropriation of an issue in certain academic areas to avoid distortions. We can infer that they also encouraged the development of the instruments of power, legalization of practices under international instruments and support.

Likewise, institutions adopted similar practices to produce the materials that led to the regulations. Within the literature of agents of translations, institutions are considered as agents:

we do include translators amongst our agents, who may also be patrons of literature,

Maecenas, salon organizers, politicians or companies which help to change cultural and linguistic policies. They may also be magazines, journals or institutions. And, as Sager points out, they may often combine two or more of these roles (Milton & Bandia, 2009, p. 1)

Translation is the process through which written works acquire history. (Montgomery, 2000), but the characterization of agents in the process of scientific translation has not gone beyond the bounds set by the history of the text, or the area<sup>17</sup>. The process of transfer of knowledge to achieve a Colombian regulation in the field engineering involved agents of various kinds. Several institutions influenced the selection of materials that were to reproduced or served as inspiration for national codes. So, in this thesis we will examine the institutions and agents involved in those critical historical process that influenced directly the process of knowledge transfer particularly related to the construction of a local code.

Previously, we set the foreign institutions that influenced the code out, highlighting the SEAOC, ACI, ATC.

Founded in 1929 by a small group of engineers in Southern California, in the private practice of structural engineering SEAOC, Structural Engineers Association of California, was created with the purpose of promoting structural engineering profession and promoting the discussion of common, ethical, technical and economic problems (SEAOC, 2007). It has been a leader in seismic safety globally. Throughout its history SEAOC has

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<sup>17</sup> Indeed, the compiled Information is scarce agents revealing the invisibility of these in literature. Noticeably production and publications can be easily found, but little information of biographical data, creation of institutions, internal aspects. Most of this information is extracted from web pages and no serial publications. Many of the established connections and data provided were provided through personal communication with the Engineer Luis E. Garcia, not using a controlled instrument as the interview, but through electronic messaging. His valuable contributions helped identify the key agents in this process.



developed several legislative matters pertaining to Structural Engineering and earthquake safety, protecting societies, impacting consequently different tradition and practices.

As for ATC, Applied Technology Council, is a non-profit, tax-exempt corporation established in 1973. Similar to the development of other entities related with seismology or earthquake investigation, ATC origins were deeply influenced by a seismic event, namely San Fernando Earthquake, which demonstrated the need for developments in seismic design standards (Rojahn, 2008). ATC's mission is to develop and promote state-of-the-art, user-friendly engineering resources and applications, with the aim of mitigating natural or hazardous effects.

ACI, American Concrete Institute, is a global leading authority devoted to the development and distribution of standards based on consensus, technical, educational and training programs. Gathering and disseminating information about the properties and applications of concrete have been consistent tasks since its foundation in 1903 (ACI, 318-71).

We can see then how those institutions were central referents, a direct influence to the codes, a matter which will be subsequently noted. At some extent, we can say that these institutions are designed with a certain character to be internationalized, creating links that we call, somehow, intercultural. Institutions transform into agents when they stimulate interculturality, the practice of translation, being crucial mediators in the history of science.

The ICPC, *Instituto colombiano de productores de cemento*, was founded in 1973, and from the very beginning it had two objectives: to represent the interests of the material at a state level and to allocate resources such as research, development and promotion programs of both cement and concrete (Bulletin ICPC No. 1, August 1973) for infrastructure, supporting and promoting the development of roads, airports, seaports

projects. Over time, the ICPC was taking a central role in the local industry and was directly involved in the regulations. The ICPC was liquidated, and the reason, perhaps, can be related to the application of an antitrust law in Colombia (Londoño, 2012).

The AIS, *Asociación de ingeniería sísmica*, is an entity attached to the Colombian Society of Engineers; It was founded in 1975. It is an agency specialized in the study, regulation and promotion of design and construction standards established by law taking into account the high degree of seismic activity in different regions of the country, requiring necessary technical updates. In this sense, it has played an important role in the dissemination of manuals and technical standards.

The permanent advisory commission for the regime of earthquake-resistant buildings was created by Law 400 of 1997; not only the commission supervises and establishes the criteria and minimum requirements for the design, construction and technical supervision of buildings, but also promotes the requirements of suitability for professions related to these processes.

These institutions were committed to development of the country and under the international support, they made visible very rapidly and very late at the same time a growing interest in translating, adapting, and creating new materials based on studies and experience, so different sectors were directly involved in the code preparation.

### **3.4 Translations format**

As previously pointed, a contrastive study is not part of this investigation, because of the emphasis on the context. Nonetheless, before making a paratextual analysis to be held in the next segment, it is necessary to describe the generalities of translations and possible translation strategies assumed during the translation process. We are using in some

cases the transcription to read clearly the excerpt used for the analysis, and the image to observe the paratexts in context.

Chronologically, in 1978, the disappeared Colombian Institute for Cement Producers translated the ACI 318-77 Code-American Concrete Institute (hence the current Title C of the Colombian Standard). The original document entitled: Building Requirements Code for Reinforced Concrete, ACI 318-77 was first published in December 1977 by the ACI, developed by the 318 committee, led by Eugene P. Holland. Since the introduction, this code is presented as a model or reference for other building codes. The code contains an introduction that validates it as a model to be adapted to different building codes expressly saying:

This code covers the proper design and construction of buildings of reinforced concrete. It is written in such form that it may be adopted by reference in a general building code, and earlier editions have been widely used in this manner (ACI-318-77, p.2).

The translation of this code was published by the ICPC in 1978, as already indicated.

Due to the promptness of the process, there is, apparently, a notable interest in translating it, because of the significance of the document, revealing how well-informed the ICPC was. In the back cover of *Código de las construcciones de concreto reforzado*, figure 2, it is important to note that translators are indicated:

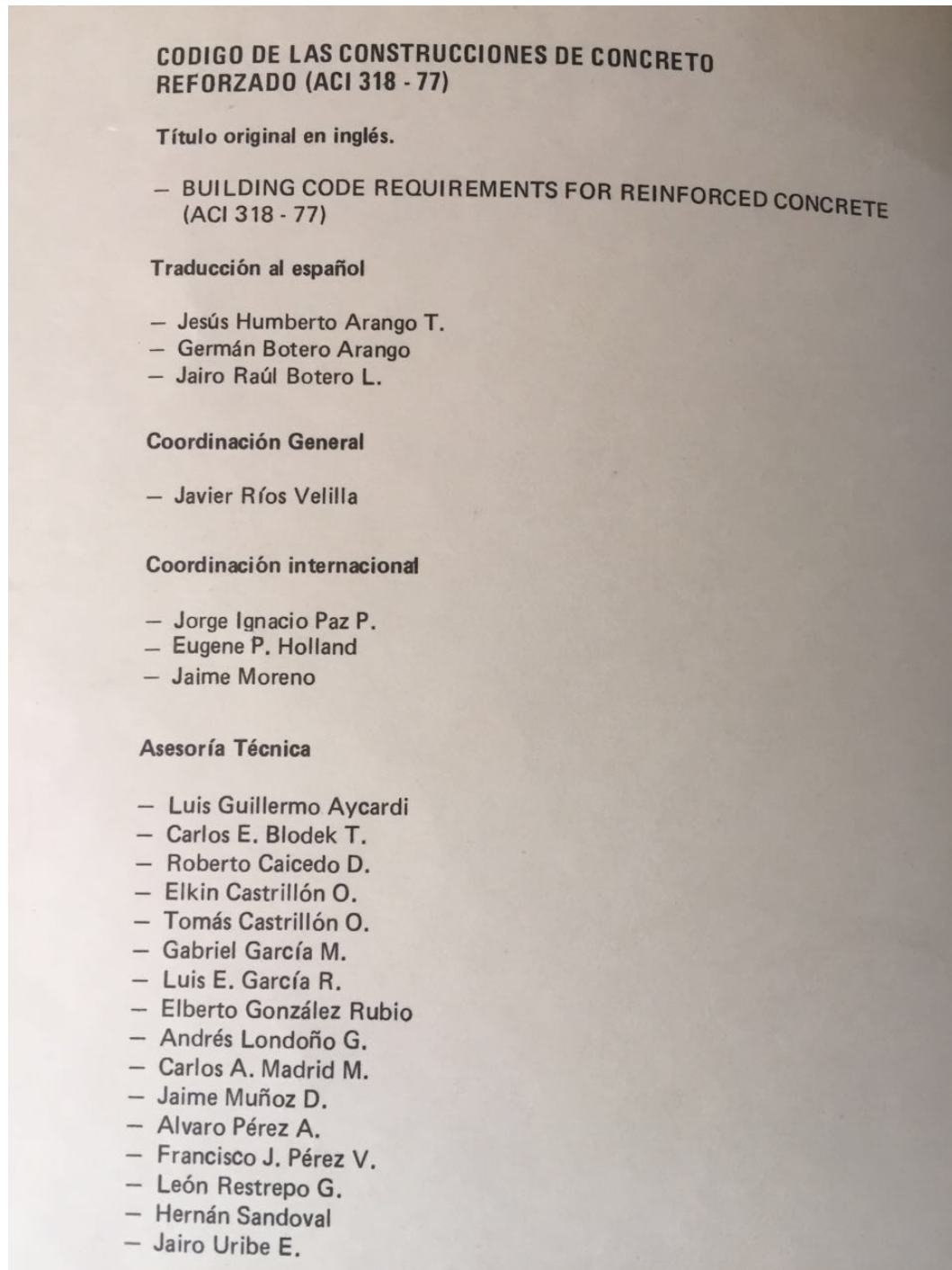


Figure 2. Back Cover. *Código de las construcciones de concreto reforzado*. ICPC. 1978

The translation was entitled *Código de las construcciones de concreto reforzado* (ACI-318-77), indicating that this is the translation of ACI 318-77. The translation

reproduces the structure of the original, it contains the same distribution, chapters, details of the original above mentioned. At the end, an epilogue describing the work of dissemination of knowledge held by the ICPC is presented. This is a clear evidence of a pedagogical function present in the publications of the institution. Not only did they develop translations; they were committed to transfer processes influencing local studies and production. A clear example of this function is represented in figure 3:

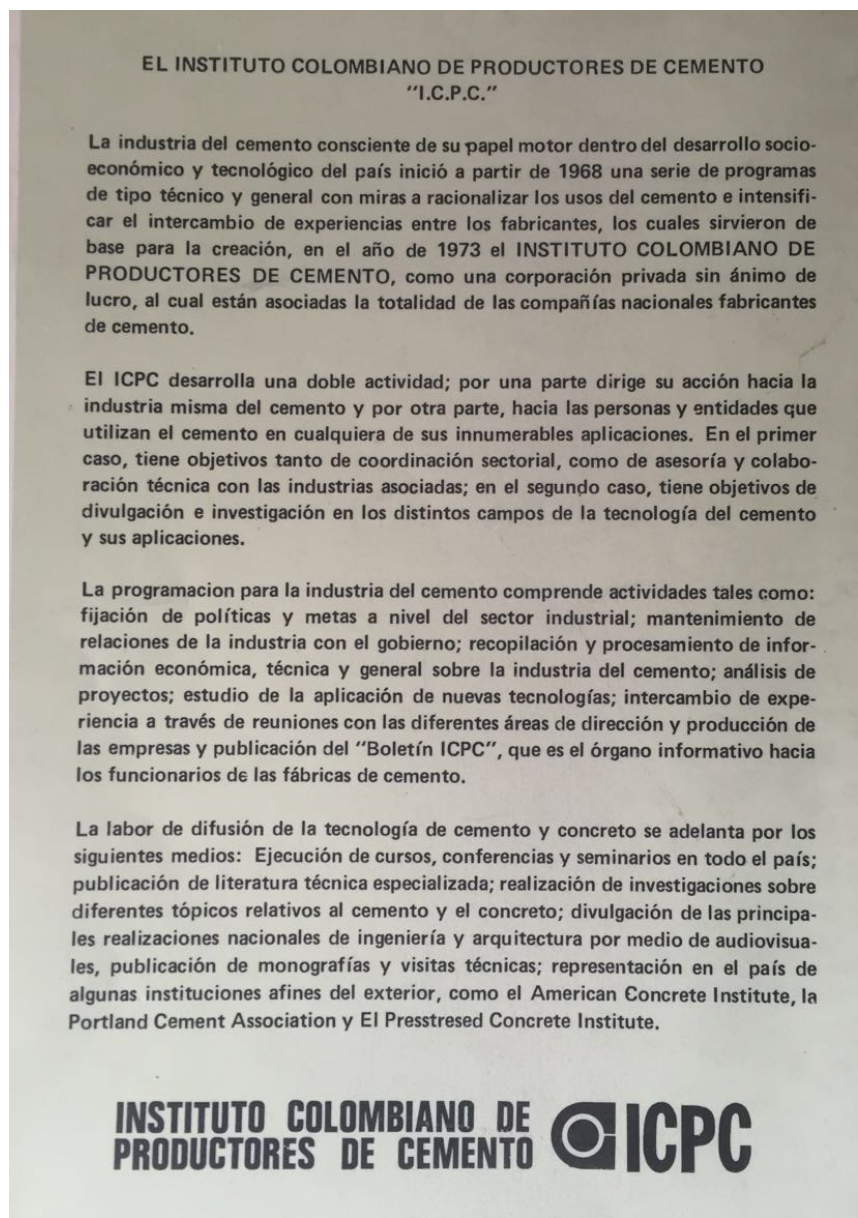


Figure 3. Epilogue. *Código de las construcciones de concreto reforzado*. ICPC. 1978

In this translation, at a first glimpse, no morphosyntactic or particular structural choices may lead to a different conclusion that scientific translation is a referential translation or a *sensu stricto* translation as it is widely known. Generally, in scientific texts, there is little clear indication of manipulation (Shuttleworth, 2011).

In light of these concepts and the presented regulations, codes, manuals observed in the previous section, there are two clear cases of translation and adaptation that can help illustrate directly how the agency of translators goes beyond the simple task of translation: although the translators task has an epistemological dimension, and is central to their agency, there is also an ethical dimension (Tymozcko, 2007). The annotated translation of SEAOC document undertaken by engineers Sarria and García produced an immediate interest in the translation of other codes and standards that were adjusted to local needs.

It is highly probable that the previous process encouraged the translation of the ATC-3 code published in 1977. It was first translated by AIS and given wide distribution. Afterwards, an adaptation was conducted in an agreement between the University of the Andes and the University of Illinois, including the participation of all the teachers who had worked in the ATC-3 translation project at the University of Illinois and some professors at Universidad de los Andes (García, 2015). The ATC-3 was adapted considering the local needs and events. This text was the basis of the documents that were adopted by the Law 1400 of 1984, and this process was precisely considered by the National Science Foundation of the United States as one of the best examples worldwide of technology transfer (García, 2015). At this point, the AIS Association adopts the document and decides to develop a standard of regulations entitled Norma AIS 100, again with the help of Professor Sozen (García, 1984). This new document was adopted in Law 1400/84. In this

case, there is not a literal transfer of knowledge, but a deliberate work of different agents, engaged in producing new options and ideas to extend the technical repertoire via transfer.

At present, there is still a tendency toward generalization, considering science as an acultural subject (Katsberg, 2007). But, remarkably, not only has the transfer provided new opportunities for various scientific exchanges, but has also encouraged the creation of, perhaps, inevitable cultural and linguistic realities imposing a certain resistance to universal forms of discourse, a resistance to absolute standardization.

Accordingly, for our research we found that a contextualization would be more interesting; for further studies, a contrastive analysis could be very valuable. Clearly aspects as tonal formality, general simplicity in sentence structure, use of pronouns, citation, article organization, standards of grammar, punctuation, sentence structure, syntax, word, are apparently similar.

### **3.5 Paratextual elements**

Paratexts are the elements that stand on the threshold of text and help present the text as an intermediary between the author and the reader (Sehnaz Tahir-Gürçaglar, 2002). They are similar to a series of layers that protect and gradually reveal the essence of the interior. From literature, Genette (1997) invites to pay attention to all elements related to the text, regardless of their nature: prefaces, epigraphs, notes, iconic manifestations, which not only constitute complementary elements to understand a particular text, but shed light on the culture in which a certain work takes places or is received. Seminal studies such as those by Tahir-Gürçaglar (2002) and Milton & Bandia (2009) have clarified the concept of paratext and its importance in the history of translation and research in translation studies in general. Genette (1997) subdivides the paratext in peritext (features of text as published

format, such as forewords, notes and cover material) and epitext (texts circulating regardless of the book itself, such as interviews, letters and marketing material). This openness to metadiscourses has been discussed by various scholars of translation (Tahir-Gürçaglar 2002), but, at the same time, it opens a direct connection to a narrative approach to cultural transfer, in which the meaning of the text is subject to change as being inserted in a new discursive context.

### **3.5.1 Peritexts**

The work of the agents involved in these processes of translation and adaptation confirm the translation as an active rather than passive exercise, taking the elements from the original text to set apart the necessary elements and adjust them to the local context.

The translation proposed by the engineers Garcia and Sarria, explicitly the SEAOC-74 code, remarked the importance of translating this text because of its widespread use in the structural engineering scenario, indicating that the original language could be a constraining factor. Correspondingly, the paratext introduces the idea of the terminology used to bring it to the local context. However, it acknowledges that "regional differences" may occur and are subject to suggestions. This is a good adaptation strategy: appealing to a familiar language. In a certain way, this is another illustration of cultural transfer: features associated to the new changes that apply when they are transferred to the target context. This also shows how languages and cultures are dynamic, even in what might be considered the same context, as in the case of discrepancies between the microcultures that can be set in the same territory:



**Introducción:** Las recomendaciones de la SEAOC han tenido más amplio uso dentro del gremio de los ingenieros estructurales que cualesquiera otras, **por lo tanto se ha considerado útil la** traducción en vista de que pudiera no consultárselas debido a las dificultades idiomáticas.

En el futuro ACIS continuará sus actuales esfuerzos tendientes a la recomendación de normas construcción sismo-resistente que consultan los parámetros propios de Colombia, algunos de los cuales se conocen aceptablemente y otros se encuentran en las fases iniciales de investigación.

La traducción que se presenta ha tratado de emplear la terminología más familiar **para los ingenieros colombianos; no obstante, es posible que existan algunas discrepancias regionales en lo que respecta a la terminología empleada. Cualquier observación al respecto será bien recibida.**

Transcription 1, *Recomendaciones para requisitos de fuerzas horizontales*, AIS, 1976.

In this last excerpt there is a significant awareness of the difference found by translators: translations do not occur directly, it is not a universal direct language, in this paratext there is an intervention of translator being aware of the difference.

In this translation, participants and translators of the process were mentioned, but always with reference to the entity responsible for the translation, in this case, the Colombian Association of Seismic Engineering. We can evidence two different features: an empowerment of the institution as agent and an attempt to create translation policies from the institutional levels. In this introduction, not only possible discrepancies are pointed out, but a manifested interest in participative consensus trying to mitigate the differences set out by the local conditions, the participations of intermediaries, demands made by entities, the level of difficulties, and the concerns proper to the agents. This type of overtly open resource performed here alters the rhetorical universality of scientific language. This is, the

strategy, based on a mixture of statement and suggestion, attempts to be adjusted to local needs examining the nature of events and influences, disregarding the premise of a universal language. Should any disclaim or discomfort may appear, they have to be clarified upon the code as a standard but pointing out the local conditions. This might reveal that for the purposes of rigorous reconstruction of information, many fragments or ideas can be not appropriate, and some of the relevant interpretations appear to be inconsistent or insufficient, so standardization is not only revealing a linguistic reality. Such as Bennet pointed out:

“For while the propagation of science discourse facilitates the flow of knowledge around the globe, bringing economic benefits for countries as well as for individual careers, the erosion of alternative ways of construing knowledge is a worrying consequence” (Bennett, 2011, p. 207).

Similarly, the Spanish *version Código de las Construcciones de Concreto Reforzado*, ACI-318-77 is an authorized translation, not a proper production and this is acknowledged on its front page, as in figure 4:



Figure 4. Front Page. *Código de las construcciones de concreto reforzado*. ICPC. 1978

In this proposed document by the Cement authority ICPC, based on the ACI-318 code, does not contain evidence of textual alterations that may indicate a possible adaptation. However, in parallel, there is a particular element on the back cover of the translation, a note by ICPC (figure 5), in which they reaffirmed that the original text was published originally in English, and in the case of any inconsistency in meaning, the English version shall prevail, giving superiority to original document. Then, again, the paratext offers a reaffirmation of the previous statement, insisting that this version cannot and does not supplant the judgment, responsibility of the user of the code. The movement of scientific knowledge is a continuous flow of substantive changes; there are some features involved in this movement such as the creation of new vocabularies and concepts “the deletion and addition of epistemological matter (Montgomery, 2000, p. 269) across cultural-linguistic borders. All these possible alterations not only affect the culture in which the text is going to be received but the general perception of the dynamics of the transfer:

In the same cover, figure 5:

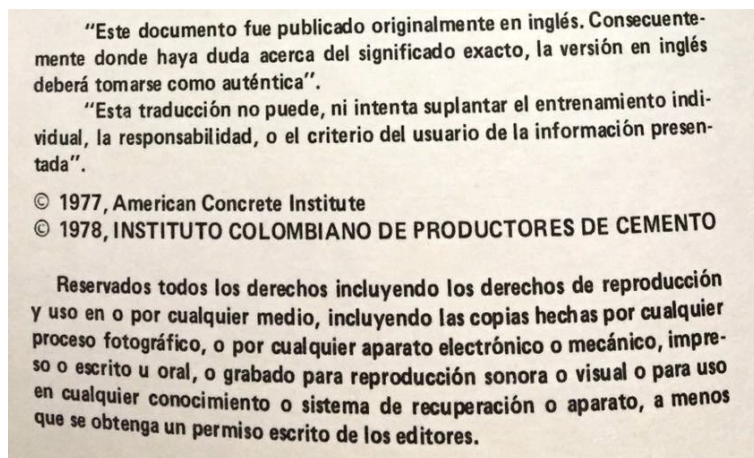


Figure 5. Front Page. *Código de las construcciones de concreto reforzado*. ICPC. 1978

Este documento fue publicado originalmente en inglés. Consecuentemente donde haya duda acerca del significado exacto, la versión en inglés deberá tomarse como auténtica.

“Esta traducción no puede, ni intenta suplantar el entrenamiento individual, la responsabilidad, o el criterio del usuario de la información presentada.

Transcription 2, *Código de las construcciones de concreto reforzado ACI-318-77*

Again, here, an important remark is highlighted. Even though the huge importance of the text and the translation, the interpretation is subject to each individual.

There are several traditional claims that we can extract from this paratext: the power of the original, the vision of the source translation, one pessimist image of translation, the idea that translation is supplanting. At this point, some ethical concerns may emerge concerning the values of responsibility, criterion, relevance that are not presented in paratexts.

The back cover (figure 3) shows a high interest in promoting the work of the institution, referring to its many activities including the publication of specialized technical literature and work with foreign specialized institutions such as the ACI or Portland Cement Association, namely, they make explicit the mobility of knowledge and the agents involved in their programs but does not refer to the specific translation task. As part of the migratory nature of knowledge, the standard invisibility of the translator is reinforced, holding the premise that the rendered object is completely familiar and appropriate:

...La labor de difusión de la tecnología del cemento y del concreto se adelanta por los siguientes medios: ejecución de cursos, conferencias y seminarios en todo el país; **publicación de literatura técnica especializada**; realización de investigación sobre diferentes tópicos relativos al cemento y el concreto; divulgación de las principales realizaciones de ingeniería y arquitectura, por medio de audiovisuales, publicación de monografías y visitas técnicas; representación **en el país de algunas instituciones**

**afines del exterior, como el American Concrete Institute, la Portland Cement Association y el Prestred Concrete Institute”**

Transcription 3, Código de las construcciones de concreto reforzado, ACI-318-77

This paratext is a clear example of knowledge transfer: publications representing knowledge transfer from other contexts; transnational collaborative work is promoted.

There is a willingness of the institution to the intercultural knowledge; cultures that are open to translation, are precisely those that are inspired by a transnational work. There is also a clear interest in multiculturalism in both ways.

Then, after the experience with the previous translation, the Earthquake Engineering Association decided to undertake a project to adapt the ATC-3 standard for the Colombian context; this is how the Standard AIS-100 was born.

The ATC-3 translation, “Disposiciones tentativas para desarrollar códigos sísmicos” presents in the title page a special treatment to the agents participant in the document as well as the translation entity, in this case the AIS (figure 6).

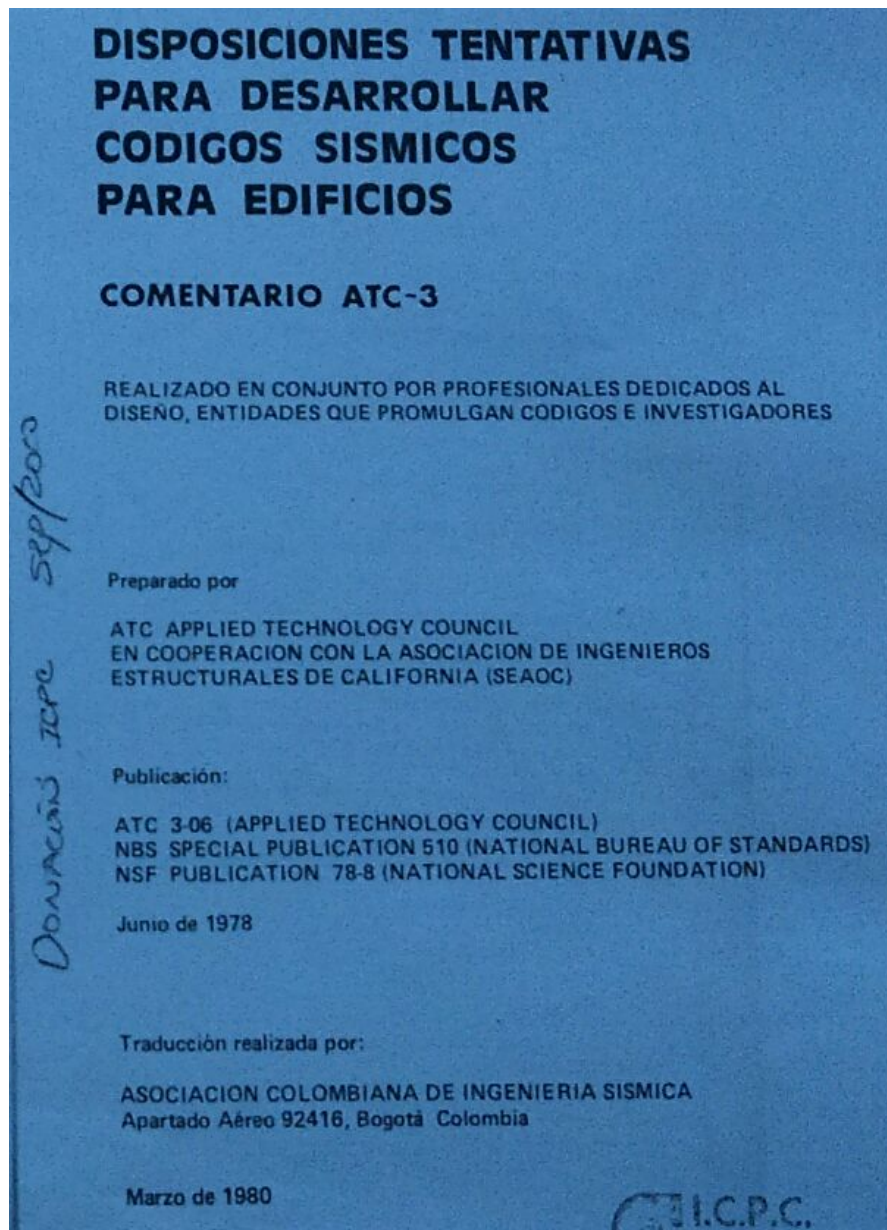


Figure 6. Cover. *Disposiciones tentativas para desarrollar códigos sísmicos. Comentario ATC-3.*

In the title page, they also include the name of the translator:

Traducción realizada por: Site Ltda (Luisa Gernanda Rozo de Suárez) (figura 3), the editing and proofreading granted to the AIS including the Engineer Luis García and a note posting the subordination of the document: “Este documento es una traducción de un documento en



inglés por **lo tanto en caso de duda** debe tomarse la versión en inglés como cierta”.  
(Disposiciones tentativas para desarrollar códigos sísmicos. Comentario ATC-3, Title page)

Parallel to this information, they observe that any doubt about the original must be addressed to the Applied Technology Council, and any doubt regarding the translations must be addressed to the AIS, as seen in figure 7:

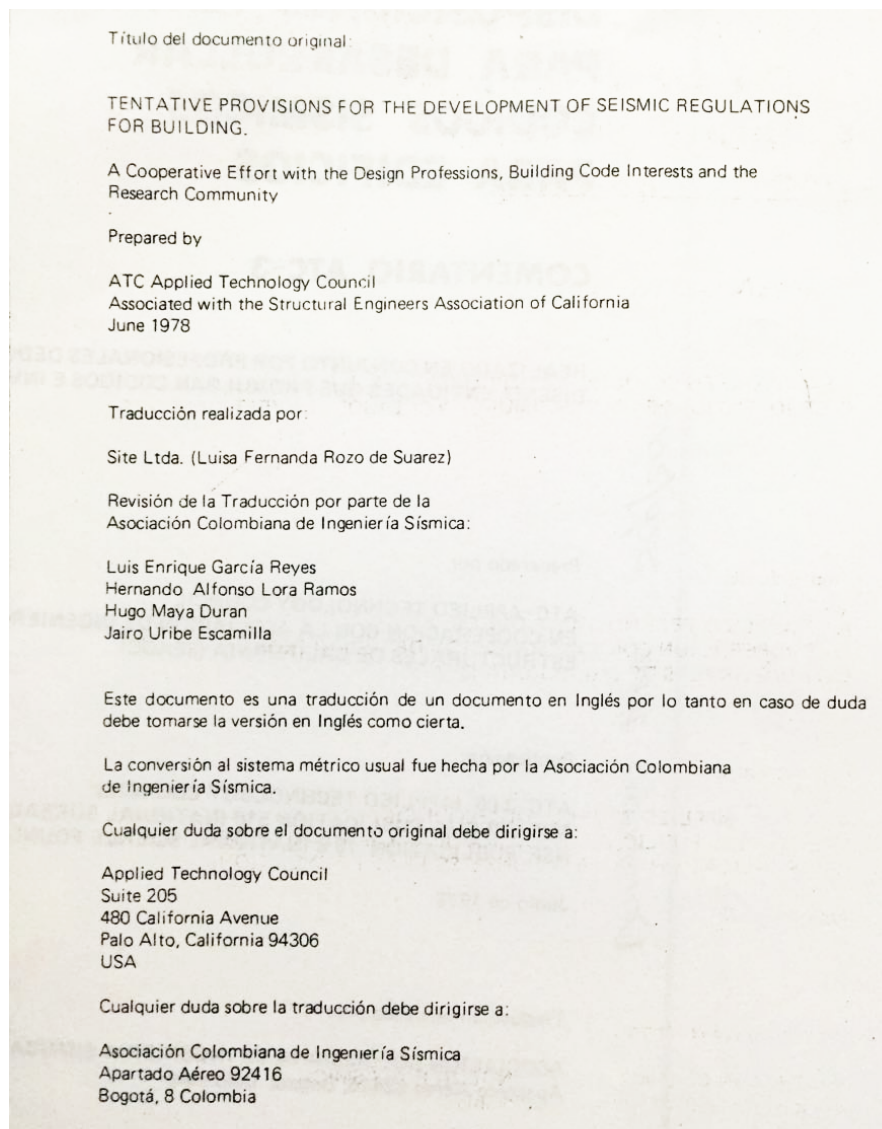


Figure 7. Back Cover. *Disposiciones tentativas para desarrollar códigos sísmicos.*

ACI is committed to provide documents in languages other than English through interactions with international partners and counterparts. Most of its technical standards are translated into several languages. The ICPC version of ACI-318-77 was a pioneer in Spanish. There have been several versions of such translations along the years. In the 2014 version, there are several entries that reflect the importance of the translation process, but it also places emphasis on the non-universality of language. Modern science is indivisible from translation (Montgomery, 2000); in fact, most part of this phenomenon began as a translation; the production of the Colombian code started as a translation, so all this process of building codes can be regarded as a collision of two languages, a purposeful accident creating and manipulating technical discourses, without any hope of universality. This shows how translation produces new knowledge and can be a way to build their own production. It can be seen that, probably, it is seeking exemption from liability in certain cases, but also beyond giving prominence to the original document, it also confers legitimacy to the effort of translating it into another language. We are not placing emphasis on the 2014 standard because it is not part of our corpus, it is a version of the ACI translations, but we want to observe this paratext because it offers some features we have analyzed in previous paratexts: a negative view of translation as a process that might contain ambiguities, omissions, errors:

Requisitos de Reglamento para Concreto Estructural y Comentario ACI-318-S14

....

**Los comités técnicos responsables de las normas e informes del ACI se esfuerzan en evitar ambigüedades, omisiones, y errores en estos documentos. A pesar de estos esfuerzos, los usuarios de los documentos del ACI ocasionalmente encuentran información o requisitos que pueden ser objeto de más de una interpretación, o**



**estar incompletos o incorrectos.** A las personas que tengan sugerencias para el mejoramiento de los documentos del ACI se les pide el favor de dirigirse al ACI por medio de sitio web de erratas en <http://concrete.org/Publications/DocumentErrata.aspx>. La utilización apropiada del presente documento debe incluir visitas periódicas al sitio web de erratas para obtener revisiones actualizadas.

.....

El ACI y sus miembros niegan cualquier responsabilidad por daños de cualquier clase, incluyendo daños especiales, indirectos, accesorios, o relacionados, incluyendo sin limitación, lucro cesante o pérdida de ingresos, como consecuencia del uso de esta publicación.

.....

**La versión oficial de un documento del ACI es la versión en el idioma inglés. La traducción de un documento de ACI se hace para la conveniencia de los usuarios. Se ha tomado esmero para asegurarse que la traducción sea correcta; sin embargo, ACI no garantiza su exactitud. La interpretación oficial de un documento de ACI será basada solamente en la versión en el idioma inglés.**

Transcription 4, *Requisitos de reglamento para Concreto estructural* ACI-318-S14<sup>18</sup>

Despite the partial vision of translation, it is also significant to notice that readers are appreciated in the translation when they state: “*A las personas que tengan sugerencias*

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<sup>18</sup> As it was previously mentioned, ACI provides numerous standards and documents through its different committees. This statement is part of the disclaimer of the new regulations of all the ACI-related publications, 2016: “14.2.5 Translation disclaimer The first page of a licensed translated document shall include the following statement: (a) “Copyright by the American Concrete Institute (ACI), Farmington Hills, MI. All rights reserved. This material may not be reproduced or copied, in whole or part, in any form or media, without the written consent of ACI.” (b) “The ACI committee or original author(s) that developed this document and ACI are the source of publication of this licensed translation. This translation has not been reviewed or approved by ACI.” (c) “This document was originally published in English. Consequently, whenever there is doubt about the exact meaning, it is the English version that must be taken as authentic.” (d) “This translation is not able to, nor intended to, supplant individual training, responsibility, or judgment of the user of the information presented. Individuals who use this publication in any way assume all risk and accept total responsibility for the application and use of this information. All information in this publication is provided ‘as is’ without warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose or non-infringement.” (e) “ACI and its members disclaim liability for damages of any kind, including any special, indirect, incidental, or consequential damages, including without limitation, lost revenues or lost profits, which may result from the use of this publication. (ACI. (2016) Technical committee Manual p. 62)

*para el mejoramiento de los documentos del ACI ...” (Requisitos de reglamento para Concreto estructural ACI-318-S14), probably revealing an open vision of the transfer process.*

It is interesting to observe a change in terminology similar to the hierarchies of names for standards, codes, regulations suggested above. The 1977 version was entitled literally *Código de las construcciones de concreto reforzado*, using the label: Code. The authorized translation of 2014 has a clause stating that it is a standard and a report, and after this explanation, the text is entitled *Requisitos de reglamento para concreto estructural*, omitting the word Code because of the local legislation, indicating a clear adaptation. It is also evident one of the great debates of engineering that has emerged in this version. The adaptation of the term *reforzado* (reinforced) in the 1977 version to *estructural* in the version of 2014. This change is the result of a purposeful recasting, pointing out not just a single terminological change but an intention to be accurate and precise. It also required the International System adoption, adapting the measures to the local culture. It should also be noted that the Colombian Constitution of 1991 limited the use of the words *Norma* and *Código* to the legislative body and therefore the texts produced as translations such as ACI, or the texts of own production such as AIS and NSR are identified using designations as regulations, requirements, standards. Those examples are clear evidences of adaptation, revealing another function of translation: to regulate. A good example is shown in figure 8:

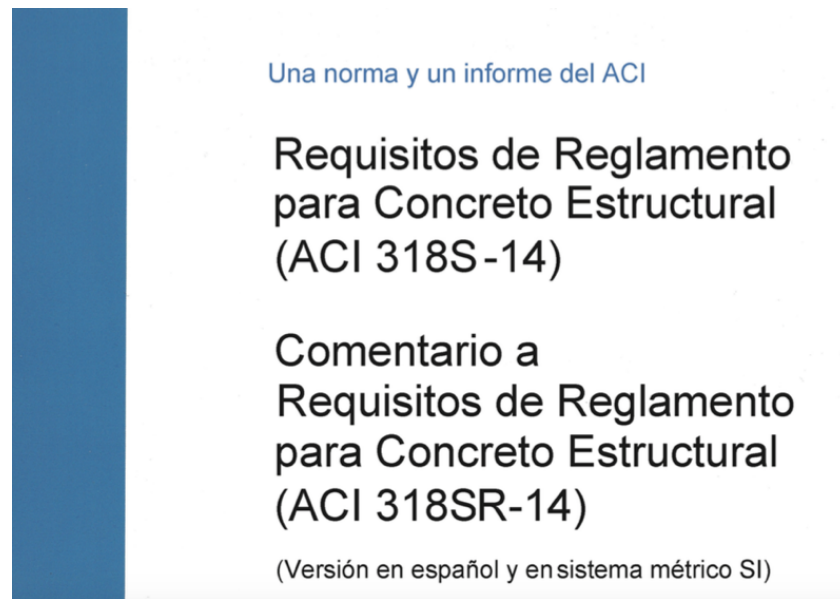


Figure 8. Cover *Requisitos de reglamento para concreto estructural*. Comentario ACI 318SR-14.

The additional commentary to this standard, which is a supplementary material to fill up the gaps or probable deficiencies that basic text might contain, insists the translation is for the convenience of users which is intended to be correct, but that its accuracy is not guaranteed, a statement repeatedly manifested in the ACI-related publications, showing once again that what is intended to be a universal language, is not. Again, the dynamics of languages, even within the scientific language arena is evidenced, as shown in figure 9:

La versión oficial de un documento del ACI es la versión en el idioma inglés. La traducción de un documento de ACI se hace para la conveniencia de los usuarios. Se han tomado todas las precauciones para asegurarse que la traducción sea correcta; sin embargo, ACI no garantiza su exactitud. La interpretación oficial de un documento de ACI será basada solamente en la versión en el idioma inglés.



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Figure 9. *Requisitos de reglamento para concreto estructural*. Comentario ACI 318SR-14.

Back cover.

The preface of the Colombian Standard NSR-10, begins with journey through the history of the concept of local regulations, revealing the idea of intertextuality previously stated in which there is a significant relationship between two or several texts, showing the important contributions of the translation of the recommendations of the SEAOC-76 by the AIS, then the ACI-318 77 by the ICPC, and then, consistently, warns that the copyright rights were registered to include a structural concrete section, namely title C, as the official translation of the ACI-318 code in different versions depending on the version, as we can see in figures 10 and 11:

### **Título C — Concreto estructural**

<p><b>Ficha técnica:</b></p> <p>Desarrollado y mantenido por el Subcomité C del Comité AIS 100 de la Asociación Colombiana de Ingeniería Sísmica establecido en 1981.</p> <p><i>Documentos base (Reglamento 1984)</i> — Blume, et al <sup>(29)</sup>, ACI 318-77<sup>(7)</sup>, ACI 318-83<sup>(2)</sup>, Norma Icontec 2000<sup>(41)</sup> y Norma AIS 100-83<sup>(25)</sup></p> <p><i>Documentos base (Reglamento NSR-98)</i> — ACI 318-89<sup>(3)</sup>, ACI 318-95<sup>(4)</sup> y Norma AIS 100-97<sup>(27)</sup></p> <p><i>Documentos base (Reglamento NSR-10)</i> — ACI 318-99<sup>(6)</sup>, ACI 318-02<sup>(8)</sup>, ACI 318-05<sup>(9)</sup>, ACI 318-08<sup>(11)</sup> y Norma AIS 100-09<sup>(28)</sup></p>
--

El diseño y construcción de estructuras de concreto reforzado y preesforzado se ha realizado en el país, aún antes de la expedición de la primera normativa de construcción sismo resistente en 1984, utilizando el documento ACI 318 del Instituto Americano del Concreto (American Concrete Institute — ACI) el cual tuvo su primera versión en el año 1908. En el año 1977 el Instituto Colombiano de Productores de Cemento — ICPC, pagó al ACI por los derechos de traducción de este documento y se realizó una traducción oficial de él, la cual fue utilizada por el Icontec para expedir la norma Icontec 2000<sup>(41)</sup> la cual a su vez se empleó como base, con las modificaciones introducidas en el ACI 318-83<sup>(2)</sup>, para el Título C del Decreto 1400 de 1984. Para el Reglamento NSR-98 se utilizaron las versiones ACI 318-89<sup>(3)</sup> y ACI 318-95<sup>(4)</sup>. Con posterioridad a la expedición del Reglamento NSR-98 el ACI ha publicado nuevas

Figure 10. *Reglamento colombiano de construcción sismoresistente NSR-10*. p. 12

El diseño y construcción de estructuras de concreto reforzado y preesforzado se ha realizado en el país, aún antes de la expedición de la primera normativa de construcción sismo resistente en 1984, utilizando el document ACI 318 del Instituto

Americano del Concreto (American Concrete Institute-ACI) el cual tuvo su primera version en el año 1908. En el año 1977 el Instituto Colombiano de productores de Cemento ICPC, pagó al ACI por los derechos de traducción de este documento y se realizó una traducción oficial de él, la cual fue utilizada por el Icontec para expedir la norma Icontec 2000 la cual a su vez se empleó como base, con las modificaciones introducidas en el ACI-318-83 para el Título C del Decreto 1400 de 1984.

(Transcription 5, *Reglamento colombiano de construcción sismoresistente* NSR-10)

The title F corresponding to metal structures also alludes to a translation process and acquisition of copyright similar to title C, indicating that translation and adaptation were developed in the 2010 AISC (American Institute of Steel Construction):

### Título F — Estructuras metálicas

Ficha técnica:

Desarrollado y mantenido por el Subcomité F del Comité AIS 100 de la Asociación Colombiana de Ingeniería Sísmica establecido en 1983.  
*Documentos base (Reglamento 1984)* — AISC-1978<sup>(13)</sup>, Código Fedestructuras<sup>(37)</sup>, NTC 2001<sup>(42)</sup> y Norma AIS 100-83<sup>(25)</sup>  
*Documentos base (Reglamento NSR-98)* — AISC-1994<sup>(14)</sup> y Norma AIS 100-97<sup>(27)</sup>  
*Documentos base (Reglamento NSR-10)* — AISC-2010<sup>(15)</sup>, AISC-Seismic-2010<sup>(16)</sup> y Norma AIS 100-09<sup>(28)</sup>

El diseño y construcción de estructuras metálicas en el país, aún antes de la expedición de la primera normativa de construcción sismo resistente en 1984, se ha realizado utilizando el documento del American Institute of Steel Construction — AISC<sup>(13)</sup>. En el año 1977 la Federación Colombiana de Fabricantes de Estructuras Metálicas — Fedestructuras, realizó una traducción y adaptación al medio nacional de él<sup>(37)</sup>, la cual fue utilizada por el Icontec para expedir la norma NTC 2001<sup>(42)</sup> la cual a su vez se empleó como base para el Título F del Decreto 1400 de 1984. Para el Reglamento NSR-98 se utilizaron las versiones AISC-1994<sup>(14)</sup>, AISI-1987<sup>(18)</sup> y AISI-1991<sup>(19)</sup>, y para los requisitos de aluminio, la norma inglesa<sup>(30)</sup> correspondiente. En el transcurso de estos años ha habido un cambio de fondo en la filosofía de diseño de estructuras metálicas pasando del método de diseño por esfuerzos admisibles al método de diseño por factores de carga y resistencia. La actualización al Reglamento NSR-10 se ha realizado con el documento más moderno al respecto que es el de AISC del año 2010<sup>(15)</sup>. En lo correspondiente a estructuras de aluminio se actualizó con respecto al Eurocódigo 9<sup>(34)</sup>, que sigue y moderniza los lineamientos de la norma inglesa utilizada originalmente en el Reglamento NSR-98.

Figure 11. *Reglamento colombiano de construcción sismoresistente* NSR-10. p. 24

El diseño y construcción de estructuras metálicas en el país, aún antes de la expedición de la primera normativa de construcción sismo resistente en 1984, se ha realizado utilizando el documento del American Institute of Steel Construction AISC. En el año 1977 la Federación Colombiana de Fabricantes de Estructuras Metálicas-Fedestructuras, realizó una **traducción y adaptación al medio nacional de él**, la cual fue utilizada por el Icontec para expedir la norma NTC 2001 la cual a su vez se empleó como base para el Título F del Decreto 1400 de 1984-Para el Reglamento NSR-98 se utilizaron las versiones AISC-1994, AISI-1987 y AISI-1991 y para los requisitos de aluminio, la norma inglesa correspondiente.

Transcription 6, *Reglamento colombiano de construcción sismoresistente* NSR-10.

These excerpts show a concrete example of transfer through the translation, a translation that inspires something new. As it can be seen, rights are paid, there is visibility of translation, of translators as vectors of new knowledge for the country. There is also a validation of translation to contribute to local science and scientific development of the country.

As pointed out previously, metadiscourses have not been considered a primary material to understand the relations that surround translation, but they are now mandatory to get closer to the narrative approach of a text. Thus, peritexts announce, explain, argue, claim, describe, expand, institutionalize, legitimate, and some other features inherent to metadiscourses. In this section, we could identify some relevant paratexts reflecting the purpose of the texts. In these, a clear intention of standardization of language is proposed, but an ambiguous reflection about misinterpretation, in which the meaning of the text can be transformed when inserted in a new context.

### 3.5.2 Epitexts

As mentioned previously, the epitexts correspond to all materials that promote circulation and disseminate translations. For the selected corpus there is little material related to the distribution of such texts.

The administrative content and advertising material can be considered in this category (Montoya, 2014). The original text, ACI 318-77, does not contain any advertising material, because it is the code issued by that institution. The Spanish translation of the ICPC, has multiple advertisements for companies related to cement and construction. In reference to that institution, it manifested that the ICPC disseminated the activity of all the associations in the country. It also promotes the institution's own publications which in this case refers to its journal. An example is shown in figure 11:

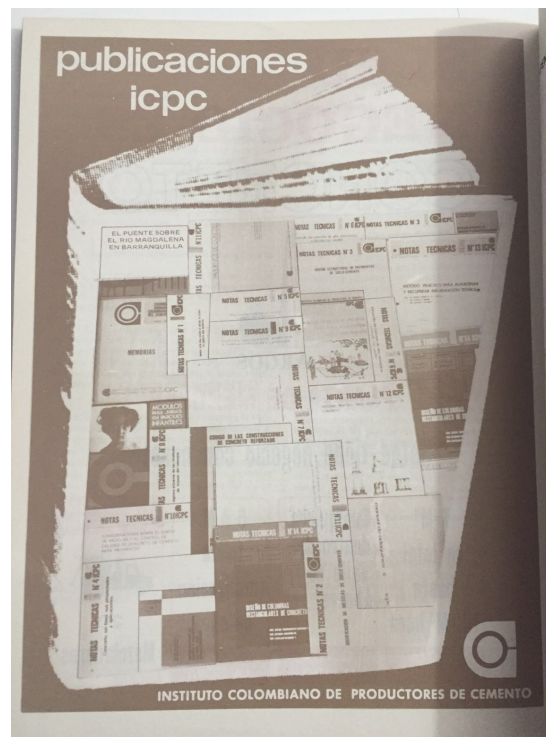


Figure 12. Advertisement sample. *Código de las construcciones de Concreto reforzado.*

(ACI-318-77). ICPC. 1978



The AIS-50 standard, that is an update to the AIS-100 standard, contains a letter addressed to the Minister of public works at that time, inviting users of the regulation to have the appropriate licenses and exempting the creators of the manual; in this specific case, the AIS from any responsibility in the works carried out considering this guideline. The image and transcript of this excerpt are shown below:

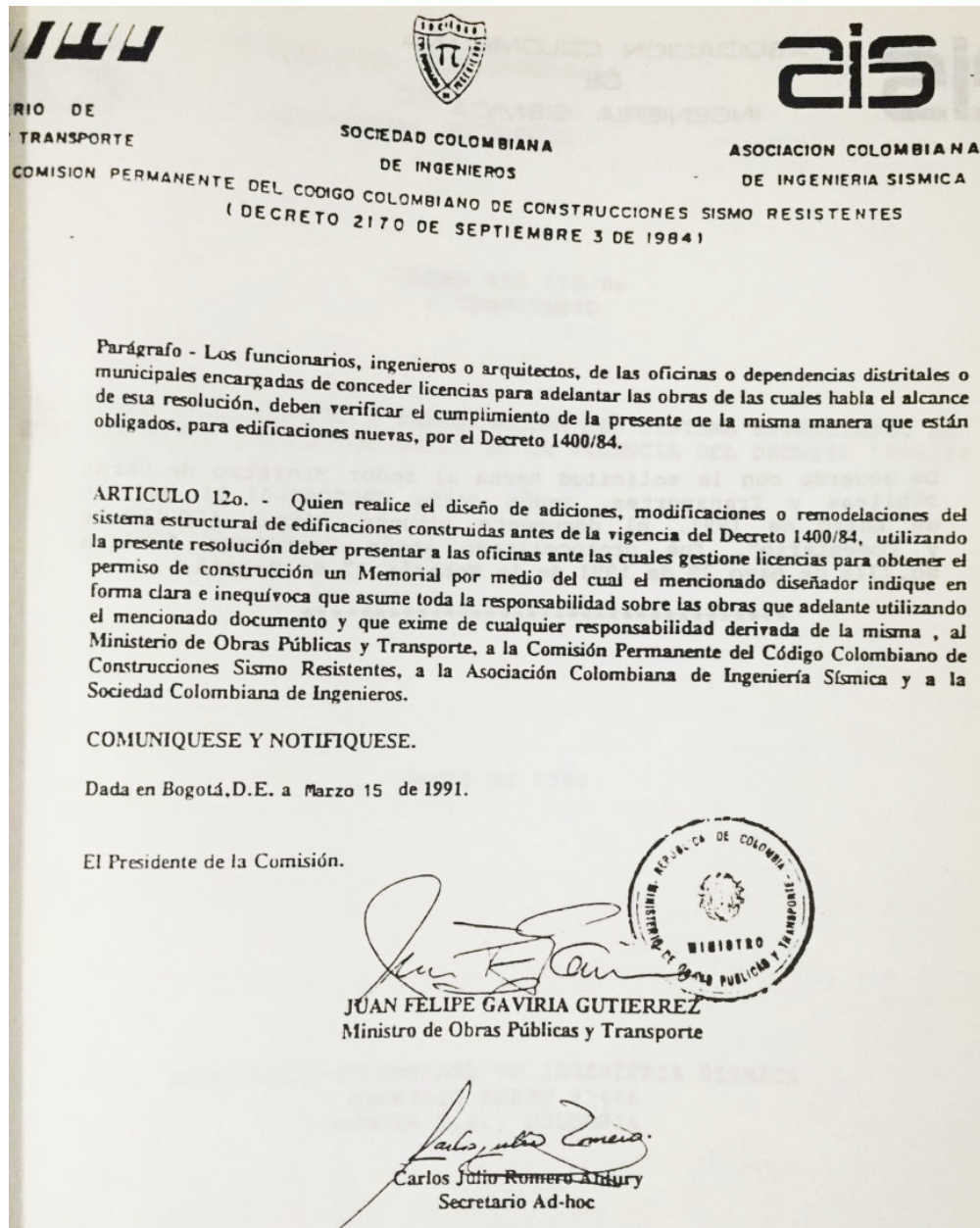


Figure 13. Letter to the Minister of Public Works. 1986.AIS150-86



“ARTICULO 12o. – Quien realice el diseño de adiciones, modificaciones o , remodelaciones del Sistema estructural de edificaciones construidas antes de la vigencia del Decrero 1400/84, utilizando la presente resolución deber presentar a las oficinas ante las cuales gestione licencias para obtener el permiso de construcción un Memorial por medio del cual el mencionado diseñador indique en forma clara e inequívoca que asume toda la responsabilidad sobre las obras que adelante utilizando el mencionado documento y que exime de cualquier responsabilidad derivada de la misma, al Ministerio de Obras Públicas y Transporte, a la Comisión Permanente del Código Colombiano de Construcciones Sismo Resistentes, a la Asociación Colombiana de Ingeniería Sísmica y a la Sociedad Colombiana de Ingenieros”.

Transcription 7, *Norma AIS 150-86 y Comentario*, 1986

Regulated by the fundamental canons for Professional Engineers, according to the Code of Ethics<sup>19</sup>, engineers shall approve only those engineering documents that are in conformity with applicable standards, but even though standards must follow strict regulations following a pseudo-universal language, this is, technical language, codes and regulations do not exempt professionals from purely technical errors and sound judgment. It is critically important that structural engineers be significantly involved in the whole process of construction and they shall approve only those engineering documents that are in conformity with applicable standards, but this is not translated in conformity with the standards, because not only language is involved, but the interpretation of codes. As seen in different legal documents related to the Standards AIS-150-86, the Law 400, regulations

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<sup>19</sup> As we already pointed out, the word “code” covers a social contract developed through local experience. In this case, it is very difficult to find a universal code of ethics of engineering. Locally (Colombia), the code of ethics does not include any paragraph related to standards or documentation: <https://copnia.gov.co/codigo-de-etica-profesional/>, The National Society of Professional engineers (United States) developed a complete statement including this information. Available at: <https://copnia.gov.co/codigo-de-etica-profesional/>.

shall be accomplished, but the application of standards, qualified education or experience in the specific technical fields involved do not seem to be fulfilled easily.

Related publications to promote or disseminate the manuals were absent. The Colombian Society of Engineers (AIS) is one of the oldest professional associations in the country and has a publication entitled *Anales de Ingeniería*. In the work of Nupia Martínez (2014), an exhaustive review of the literature surrounding scientific practice between 1960 and 1978, indicating that it lacks a discussion in this interval on the creation of a scientific policy, inviting researchers to fulfill this gap. The concerns outlined in that investigation show more aspects of the growth of engineering programs in the country, the proliferation of non-academic bodies, lack of laboratories and libraries, i.e., problems more related to the teaching and learning not to the policies and regulations. There is scant literature to reflect on the lack of policies and regulations (Nupia, 2014), but in the work of the agents involved in the creation of the Colombian current standard NSR-10 an effort to link the agents, the sequence can be identified. The vast work of Professor García in his different publications described and promoted the use and consensus standards tailored to the local context. However, the role of translation in this process has not been sufficiently exalted.

A cultural approach allows a more critically standpoint of translation including process, agents, translations, abridgements, paratexts and all the features intertwined to understand that translation is more than two texts interconnected giving relevance and different meaning to science language by which scientific activities and methods are coordinated. The history of science lacks studies of this language, but in this chapter, through an analysis of agents, foreign institutions, local institutions, peritexts and epitexts we could identify the triad *translation, knowledge, culture* we defined in a previous chapter. The transfer phenomena, as a cultural exchange process, including verbal and non-verbal

features are revealing in this study. Some of the relationships could be emphasized identifying the agents that contributed to the process of acquisition, translation, adaptation and creating of building codes. Then, some relations linked to the process, to language itself, to the general interest of knowledge dissemination could be identified. Language, translations, processes, are not developed in vacuum. Undoubtedly, very few studies have been carried out on this phenomena of transfer in the scientific area; the role of translation, the agents, specifically translators as marginalized figures whose work has played a significant part in different accomplishments, and institutions ensuring publishing, dissemination of knowledge; there is therefore much scope to extend translation research into different areas which certainly must include different approaches, the translation of different genres, the study of the universe outside the texts.

## **Conclusions**

In this part we intend to establish a relationship between science and translation, reflecting on the importance of studying scientific texts, as opposed to the great emphasis on literary and religious texts that has been the tradition in Translation Studies. Here, I do not intend to provide a definitive solution), because as it could be seen from the discussion above, even the simplest question related to the study of any kind of texts is a painstaking work, so it is precisely a methodological approach including a consistent theoretical framework that provides consistent results.

The main conclusions of this thesis are summarized in relation to contributions to the different areas that were addressed in this work: contributions to the general history of scientific and technical translation; methodologies for translation history, and finally general contributions to the history of translation, engineering and multidisciplinary in Colombia.

### **Conclusions related to the general history of science and translation**

This study increases the need to see scientific translation as a cultural practice, favoring mobility and exchange; science is a fundamental part of culture, and it is therefore necessary to incorporate reflection on the relationship between science and translation in different studies to offer an insight into its preponderant role in society construction.

In this research, the role played by translation in building regulations for Colombian engineering, presenting a vision of cultural exchanges in Colombia of significant interest to the general history of science was illustrated. In this investigation, cultural exchanges

referring to the word culture in its widest sense, not only seen in the characterization of a society but also modes of life, value systems, traditions and beliefs were revealed.

Accordingly, the study of scientific translation is a study of how culture has evolved through translation; to that extent, translation is a tool for cultural and scientific progress. The lack of proper regulations in Colombia made visible the need to standardize engineering practices in parallel to the accelerated progress of technology and changes in the mode of human life as compared to other contexts. So integrating translation as a dynamic force interacting in cultural systems, we can trace the path of progress in a particular period. As we could see, history recognizes the progress but it does not necessarily recognize not all the disciplines involved in it, specifically translation in our case.

Societies have evolved through the transfer of knowledge and it is precisely here where translation and all its agents has been rendered invisible. Even though this “progress” seen as the “forward movement of society toward civilization” (Montgomery, 2000) has been marked by translation contributing toward a national common good, it is not sufficiently recognized.

Through this kind of research, the field of field of non-literary and non-religious translation begins to be visible, regarding a cultural standpoint. Previously, we noticed that most of the literature on translation has given extensive consideration to literary texts. But from a cultural perspective, translation, in general terms, responds to other interests and goals; it is a dynamic practice that impacts the political, social and economic systems.

There is a vast amount of scientific translation that has not been studied, these translations persistently remaining unnoticed; it is then necessary to conduct more studies about them because they can offer other visions about the conception of translation and its

different practices in a particular context, and can help reconstruct intricate networks, involving foreign institutions, multidisciplinary agents expanding traditional notions of agent and network; thus, acting as a network many questions about language and translation have to be solved.

In this way forward, the codes and standards studied were not translated just as a need to translate; they suffered adaptation processes and filled some gaps in the field of engineering in Colombia. Generally, they have two functions: a pedagogical, institutional function, directing engineering learning and practices; a second function was geared towards standardization; there is a clear role of translation to legitimize, to standardize: agents were seeking a legitimization of these standards through interaction with foreign agents.

In this work within a legal framework, laws that support the technical standards are promulgated. Several conditions lead to the selection of material to be translated, such as social, disciplinary, political conditions; in our particular case, the Popayán earthquake, political and technological developments, the emergence of engineering university programs, as well as the legal void determined the selection of translation and influences. This system consolidated the Colombian standard as a mirror of other influences directly influencing the experiences in the local engineering; they are not closed systems, they are dynamic. Consequently, trying to strengthen a system, there is an interaction of academic, political and economic needs, which require to be normalized, there comes into play the need for interaction towards a system of rules with other systems. Accordingly, the development of rules of civil engineering in Colombia is established through interaction with the American system. Taking into consideration the transnational turn in translation

studies, this work illustrates the primary rather than secondary role of translation in the construction of culture.

### **Conclusions related to methodologies to study translation history**

The history of science, reconstruction of agents often from secondary sources is not as precise as primary-source information, because there are not many rigorous studies with this perspective.

Different methodologies to conceive translation history have evolved with respect to their models, objects and sources. This research conducted a methodological design consistent with recent developments and it was found that there are very valuable objects of study from the point of view of translation studies in Colombia. This area, history of translation, has not traditionally been studied in Colombia. As we could observe along this investigation, there is an expansion of the concept of translation based on different theoretical principles such as polysystems, descriptive translation studies and cultural studies.

When the nature of scientific texts is observed beyond their linguistic characteristics and its focus is placed on how texts are selected, how they are perceived, translational features, rather than linguistic data, are evidenced, such as the motivation of translating and publishing, the ideological values, the reception of the information, which give a different view of the translation. This approach broadens the horizon of translation helping ratify the concept of assumed translation as a valid notion for translation studies, as well as expanding the notion of translation viewed beyond a one-way relationship and at the linguistic level exclusively.

From the methodological point of view, this thesis provided methodological clues to study translation in context. For this purpose, different sources were explored in addition to translations, so it was possible to carry out such contextualization. Thus, the parameters of DTS and sociocultural proposals and methodologies from history of translation are not restricted to the establishment of a corpus but seek explanations and generate a critical position about the translation phenomena. The perspectives resulting from this methodological approach, present translation as a dynamic activity related to its geographical environment, its agents and the discourse proper of the area. The material used to contextualize these translations consists mainly of paratextual and extratextual sources.

Paratextual analyses constitute a valuable methodology that provides a metadiscourse in which explanations about the cultural exchange can be revealed. If we move from the quantitative to the qualitative approach, paratexts are a primary source even though they have been poorly recognized and are not defined as central materials; paratextual materials give voice to translators, reveal valuable information about the process, and contribute to an understanding of the context surrounding a text.

### **Conclusions related to methodologies to study translation history in Colombia**

Helping to expand the notion of translation in the translation-oriented context, this investigation contributes to translation studies globally and particularly in Colombia through the study of other forms of translation. Translations and conceptions of translation must be studied from different disciplinary areas. We are here studying the translation from an engineering and in a certain way, from a legal framework. It is an activity that generates



new knowledge, criticism, particular movements that revitalize knowledge, establish stronger links between disciplines.

Paratexts allow giving voice to the agents, recognizing their institutional value: the translator as an institution, the translator who speaks for the whole. Studying the context, we can identify personal and institutional networks, the importance of networks for the context, the relationships between institutions for transnational networks. All the government, private and academic institutions, national or international allowed a process of translation to be conceived, giving relevance to the institution as a translation agent in every context; the institution should be studied as a promoter and producer of translations.

Here, paying attention to agents reveals different binomial relationships: translators-engineers, engineers-translators, scientists-translators.

There is a remarkable insight that could be found along the thesis: these texts uncover a disposition towards translation. Some paratexts revealed a clear purpose presenting an original but opening the path to an interest in translation.

We also find in these translations two positions: there is a clear objective to reproduce and maintain the hegemony of knowledge, with a very intercultural perspective because there is not an idea of obligation, because there is reciprocity. The second position is a globalizing mission of knowledge: being translated is a form of being validated. Paratexts confirm that scientific discourse is not universal.

Finally, the triad *translation, knowledge and culture* is an essential arrangement to understand the dynamic forces that lead to the building of societies, taking models and mirrors as influences of order, direction, and progress. They are validated through transfer processes involving multidisciplinary entities that cannot be ignored. Similarly, the notion of transfer defines a critical historical process that uses translation as a power and

dissemination tool. Consequently, the transcendence of translation goes beyond the phenomenon of language; translation is a great multiplier of contexts, connections, knowledge, virtues, power and culture. Thus, cultural transfer is not a mere transmission of texts and language, as discussed above; it represents the mobility of models, words, concepts, thoughts, ideologies, power.

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