The Contribution of the Mass Media to the Creation of the Mental Model of the Atomic Energy: Ideology, Cognition and Discourse.

Student: Celeste Moreno Palmero

Supervisor: Dr. Begoña Núñez Perucha
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1. INTRODUCTION

We do not really know to what extent language is the most powerful weapon that can be used for ideological purposes. Through language one creates the world. Language allows receivers to understand abstract or new concepts. By the use of language our universe can be organised. However, the social function of language should be placed under the light of a critical revision, since language, as any other social instrument, tends to be under the control of powerful institutions (Van Dijk, 1998). From a critical perspective one could assume that whenever a new definition or idea is provided, the invisible threads of ideology and power are likely to operate behind (Fairclough, 1989; van Dijk, 1998). Language creates and reflects the world, but language can be under the dominance of powerful institutions. Actually, language is dominated by elite discourses that may generate alternative views depending on ideological preferences. In this sense, as authorities have access to discourse they may generate particular conceptualisations of the world.

Whenever a new concept is created a set of linguistic strategies starts to operate in order to give rise to a mental model that will be stored in our minds as a new element of our mental lexicon (Aitchinson, 1987). Some authors have claimed that the basic strategy to understand new meanings is by the use of metaphors (Lakoff and Johnson, 1980; Aitchinson, 1987). However, when carrying out a deep analysis of texts or discourses that may provide a new mental definition, one can discover that there are many different factors involved, and that a study of the conceptual metaphors used when creating a new mental model would not be enough to depict the network of meaning that operates within the actual new mental model. This is the case of the mental model of the atomic energy on which the present paper wishes to focus.
In 1945, America faced the emergence of the atomic energy. This type of energy, created by Americans, was used in the form of two atomic bombs against Hiroshima and Nagasaki to put an end to the WWII. At that time, “the atomic energy”, as a new concept, required a definition to be stored in the speaker’s minds. However, given the criticism that the effects of the atomic bombs encountered, the media discourse on the atomic energy became characterised as “propagandistic”\textsuperscript{1}.

Many researchers have focused their studies on the propagandistic discourse created by American institutions during that period so as to generate a positive view of the atomic energy (Burchett, 1983; Wagar, 1989; Yavenditti, 1974). However, they normally focused only on the ideological effects of those pieces of discourse. Little attention was paid to the fact that by providing a definition of the atomic energy, those news articles or political speeches were also generating a new mental model that would be apprehended and used by the receivers as the mental definition of the atomic energy.

As mentioned before, the atomic energy, and more specifically the atomic bomb, required of a mental description in order to be included in our mental lexicon. Politicians, thinkers, scholars, and journalists played an important role at an ideological level. Besides, they could also be thought to contribute to the conceptualisation of the atomic event, since they created a discourse on the atomic energy, a way that at that time could be ideologically constructed or not but that it was required for people to understand the new concept. This paper will show how from an ideological constructed discourse a model of representation of a new event is created.

\textsuperscript{1}One of the most famous articles against the bombing of Nagasaki was written by Wilfred Graham Burchett, \textit{The Atomic Plague} (Sep 5, 1945). www.organicconsumers.org/artman2/uploads/burchett_in_hiroshima.doc
1.1. Research hypothesis and objectives

The focus of this study is to analyse the ideological effects of media discourse on the creation of a mental model of the atomic event. The starting point of the present study is that ideological discourses, and more specifically news articles, made an enormous contribution to the creation of the mental model of the atomic energy. In particular, the research hypotheses can be formulated as follows:

(i) The first news articles about the atomic energy were highly ideologically constructed, presenting particular features in order to produce a positive reaction about the new energy in the readers’ mind.

(ii) Those first news articles, by defining the atomic energy, also created a new mental model. A model that can be conditioned by the ideological discursive strategies used by the author, but that it is crucial to store the new meaning within the readers’ mental lexicon.

The aim of this research is to examine how a set of news stories written by William Laurence about the atomic energy and the atomic bomb contributed, with their ideological discursive structures, to the formation of the mental model of the atomic energy. The present study intends to draw the ideo-cognitive map generated by means of these articles in the reader’s mind. This paper argues that by means of cognitive devices, the receiver is capable of creating a network of nodes, that is, a schemata which allows him/her to elaborate a mental model. Thus, the purpose of the present study is to connect cognition, ideology and discourse so as to create a triangle of meaning that can facilitate the understanding of the complex network that operates within a mental model. As we will see, discourse works at the same time at the ideological level, to create identity of the group or to form a particular opinion of the event on the receiver’s mind, and at the cognitive level, producing a mental model of the atomic energy.
The theoretical framework used to analyse these articles is based on Van Dijk’s socio-cognitive theories; in particular, this study uses the principles proposed by this author in his analysis of the ideological discursive strategies (1998). Besides, to give light to the conceptualisation of the new event, an analysis of all the metaphorical expressions found in the articles is undergone. This analysis follows the parameters proposed by Lakoff and Johnson (1980) about conceptual metaphors. Finally, and to reinforce the main question the study maintains, its claims about the networking of interrelated meaning that operates within the mental model of the atomic bomb, by supporting the analysis with Fillmore’s (1987) frame semantic and Coulson’s (2004) conceptual blending theories.

1.2. Corpus and methodology

The reasons for choosing Laurence texts are diverse. On the one hand, the context is propitious for creating opinion; information about a new event has to be provided under the light of an authoritative discourse. The texts belong to a renowned newspaper—The New York Times—, and the author seems to have the approval of the highest institution dealing with the atomic affair, The Manhattan Project. The corpus consists of a set of seven texts from the newspaper The New York Times that were written by William Laurence between 1939 and 1945:

1. HUGE ATOM BOMB TO TEAR WORLD VEIL (Oct 24, 1939). This article has an extension of one column and a half. It is not located on the front page.

2. ATOMS BROADCAST SECRETS TO SCIENCE (Dec 30, 1939). As the previous article, the extension is approximately one column and a half. It is not on the front page.
3. ATOM BOMBING OF NAGASAKI TOLD BY FLIGHT MEMBER (Sep 9, 1945).

   Both articles, 3 and 4, have an extension of one full page and a column of the front page.

5. DRAMA OF THE ATOMIC BOMB FOUND CLIMAX IN JULY 16 TEST (Sep 26, 1945). This article takes up the same as the previous one.

6. LIGHTING BLEW UP DUMMY ATOM BOMB (Sep 27, 1945). This article takes up approximately half a page.

7. ATOMIC FACTORIES INCREDIBLE SIGHT (Sep 29, 1945). This article takes up a full page “inside”.

In all these articles, which belong to a bigger set and that were selected given the relevance of their content, the author explains to ‘laypeople’ the new event of the atomic energy and the atomic bomb. These texts can be considered as relevant for the present purposes because the author is regarded as an authority, so his description of the event is likely to be assumed as truth. He can be said to provide a definition of the new event which will be stored in the receiver’s mind, given that he is a scientist commissioned by the Manhattan Project. In this sense, his discourse seems likely to be ideologically loaded.

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2 In an article dated Aug 7, 1945, *The New York Times* introduces the figure of William Laurence to the public. In this article, Laurence is addressed as the man that will enlighten laymen on the working of the atomic bomb. Besides, the newspaper makes emphasis on the good reputation of the scientist, that is even a Pulitzer prize winner.
These texts were mainly produced just right after the atomic bombing of Hiroshima and Nagasaki in August 1945, which meant the end of the war. It could be argued that this is a relevant fact that may influence the way readers perceived the atomic bomb. Besides, from a cultural point of view, the bomb, as the author constantly reminds the readers, was created by Americans, which could reinforce the notion of American people as the heroes that were capable of putting an end to a blood-spattered and long conflict. Both, historical and cultural contexts are crucial to understand the institutional position and the discursive strategies used by William L. Laurence.

The present paper carries out a qualitative analysis of the data. In a first stage, the texts were studied following van Dijk’s (1993, 1998) socio-cognitive theory in order to try to analyse the ideological structures of discourse through which the event of the atomic bomb was represented in the texts. First, the study analyses the structures at the global level; then, the structures at the local level, more specifically, the levels of description of the information, lexicalisation and style.

In a second stage, the research turned to the analysis of the conceptualisation of the atomic energy. At this point, the texts were examined so as to find the conceptual metaphors used by the author. These metaphors were supposed to be the essential basis of the mental model generated by the texts. The metaphorical analysis, which follows Lakoff and Johnson (1980) assumptions, was divided into conventional metaphors and non-conventional ones. The analysis includes a set of diverse conceptual metaphors that are crucial to understand the new event of the atomic energy and by extension of the atomic bomb. Finally, both ideological assumptions and the basic conceptualisation of the atomic energy/bomb were studied together as to create the complex network of meaning that operated within the mental model generated by these articles. At this point, it was assumed that both ideological discursive structures and conceptual
metaphors worked together. For that reason the study turned to the interaction between these two domains.

1.3. Research organisation

The present paper is divided into 6 chapters, an appendix, and the bibliography. After this introduction, chapter 2 presents the theoretical background used for the analysis. In chapters 3 and 4, the ideological discursive structures and the conceptual metaphors are respectively analysed. Chapter 5 attempts to show the possible link between discourse and cognition. In chapter 6 a conclusion about the main findings of the research is provided. Following this last chapter there is an appendix that contains the news articles analysed in the present paper and, finally, a bibliography with the literature used for the research.
2. THEORETICAL BACKGROUND

The present paper carries out a multidisciplinary approach that includes theoretical backgrounds with a very diverge origin. As a crucial element required to prove that these texts were ideologically constructed, the analysis turns to Critical Discourse Analysis as to try to throw light on the relation between discourse and ideology. In particular, the paper uses the approaches provided by Van Dijk’s (1998, 2005) theories about ideology and ideological discourse structures. However, this is just one part of a complex study that incorporates also a cognitive approach in order to explain how the new concept is stored in the receiver’s mind. As has been previously argued, given the contexts in which the articles were created, these texts were also contributing to generate a new mental model. In order to explain how mental models operate, and more specifically how mental models are created, the study makes use of Lakoff and Johnson’s (1980) proposals about conceptual metaphors. Nonetheless, the purpose of the research is to show that apart from conceptual metaphors there also certain ideological structures that are present at the cognitive level in the configuration of the mental model; for that reason, the study uses the works of two cognitive linguists, Fillmore (1987) and Coulson (2004) so as to complete the multidisciplinary analysis that the present research aims to carry out.

2.1. Ideology and mental models

Following Van Dijk’s socio-cognitive approach this research analyses the ideological structures that Laurence uses in his articles to represent the event of the atomic energy. According to Van Djik (1998, 1993), ideology endows a group with identity and consciousness of group by means of a set of shared goals, norms, values or
activities. Furthermore, ideologies are not just a mere act of persuasion. Thus, ideologies are the fundamental social cognition that organise the social representations, attitudes and knowledge of the group. Another aspect that is relevant to this research paper is the fact that ideologies are based on the exercise of power through discourse; discursive power can be persuasive and by means of different rhetorical means it can enhance the probability of building the desired mental representations.

Power is mostly cognitive and performed by persuasive and manipulative interests (Van Dijk; 1989, 1998). One of the most powerful instruments of persuasion is media discourse, in the sense that it provides the readers with models of interpretation. According to Van Dijk (1995, 1998), media power is persuasive, because it has the potential to control the minds of readers or viewers by developing truth beliefs that become part of our cultural knowledge. A good account for this view can be found in the texts under analysis here. By means of ideological basic assumptions anchored in the main principles of the cultural knowledge of the American society, a new cognitive model was defined. This definition, based on ideological selection, makes the readers able to understand a new event; that is, they can construct a model in their minds, a model that is based on the knowledge and attitudes of the ideological group. By means of different cognitive and ideological strategies, opinions can be transformed into facts and facts can become truth beliefs stored in our mental memory as models. Models represent our personal opinions. For that reason, models are considered subjective and unique. However, these personal models are based on social cognition, because, as claimed by Van Dijk (1997: 210), the process of model construction involves fragments of instantiated socio-cultural knowledge and abstract personal models of event or personal attitudes.
It can be argued that the formation of mental models is the basis of ideological discourse and benefits from the use of persuasive strategies. Van Dijk (1998) defines persuasion as a discursive strategy that can make people change their opinions. But persuasion only works properly if certain cognitive conditions are favourable. The audience has to have some general background knowledge and certain beliefs to understand the persuasive strategies, since for a discourse to influence evaluative beliefs, it has to be understood, even in a slightly way, by the receiver. It is expected that the reader has generated enough cognitive competence so as to understand the truth criteria implicit in a persuasive discourse. This process can be facilitated by the use of commonsensical examples that are easily recognized by the audience.

2.1.1. Ideological structures of discourse

Van Dijk (1991, 1998) identifies a set of ideological structures of discourse that can function persuasively. He names them ‘Ideological Discourse Structures’. These structures, according to Van Dijk, express ideologies in a subtle way. The author distinguishes two levels of analysis: a global level and a local level. What follows is a summary of the most relevant aspects of Van Dijk’s proposal to the purpose of the present study.

At a global level, the topics, themes, participants and contexts have to be studied so as to see in what aspects or themes the author is focusing by topicalisation. Van Dijk claims that these global structures organise the semantic microstructures. Topics can be useful for further abstraction and construction of ideological attitudes. In brief, topics play a relevant role in the local comprehension of a text since they activate specific kinds of knowledge. For that reason the analyst has to study topic content as a first clue
of the ideological position of the writer. What is significant at the topics level will remain as a key element in the local meaning of the texts.

At the core of local meaning, what one finds is the actual discourse, which will present the most ideological content. As a general pattern, at the local level the most relevant feature is the ideological representation. As Van Dijk (1998: 268) maintains, there is some information that can be communicated and highlighted by the author whereas some other information is left out on purpose. For this author the relevance of a topic among the others is crucial to ideological analysis. He analyses the different degrees of detail within what he names ‘detail and level of description’ (267), and argues that within the level of description one can find issues that are emphasized, and others that are hidden. Media discourse can make a varied selection of what is said and what is not, who the participants are, and how the information is organised. On particular occasions not only is a topic prominent among the others, but this topic is reinforced by the inclusion of irrelevant information related to the event. This is what Van Dijk calls ‘overcompleteness’ (268), that is, cases where the writer or speaker includes certain information that is not necessary for the complete comprehension of the event.

Van Dijk (1995, 1998) maintains that at this local level semantic selection is crucial to accommodate a text within a particular ideology. This author emphasises the relation between lexicalisation and ideological representation, since by choosing specific words instead of others, the writer or speaker is positioning himself ideologically. Word selection is crucial for ideology; the way an event is represented by means of certain lexical items may produce a positive or negative view of the event in the receivers’ minds.
Style is also of interest for ideological analysis. Genre, setting, participants or any surface structure may be adapted to convey an ideological purpose. Lexical and grammatical styles along with syntactic structures are explicit ways of presenting ideological opinions. Style can be considered as the structure of social contexts as it defines the position of participants within the ideological context (Van Dijk, 1998: 272).

In sum, Van Dijk’s socio-cognitive approach represents a useful framework since he states that mental models are based on social cognition; that is, that the personal way of representing reality has its roots in an ideological frame. However, this study assumes that discourse is also at the basis of the formation of cognitive models. As we will see in chapter 4, these mental models can also invoke a series of cognitive frames that provide a mental definition for the new concept of the atomic energy and the atomic bomb.

2.2. Conceptualisation patterns: the creation of a mental model

From the previous overview of van Dijk’s socio-cognitive theory, we can assume that ideology plays an effective role in the generation of cognitive models. Generation of cognitive models and media discourse can supply the reader with the necessary instruments to create their own personal mental model. However, the study of how mental models are constructed should take into account not only ideological discursive strategies but also some other cognitive devices, such as conceptual metaphors of frame semantics.

We apprehend the world through language. In order to understand new experiences we need to define them in our mental lexicon (Atchison 1989). With regard to this idea, Atchison claims that words are stored in our minds into an organised system that enables a person to understand them. Whenever a new concept is created, an
internal mechanism operates in our brain in order to store the meaning in what has been called mental lexicon. This mechanism accommodates words relating them to other words that we already know, sometimes it is mainly done by mapping between different conceptual domains (Fauconnier, 1994); in other circumstances, the word is included within a semantic frame that provides it with meaning (Fillmore, 1982a). Far from a dictionary definition what we get into the mental lexicon is a web of interconnected meanings that creates a mental image of the concept itself within an interlocking system of meanings (Atchison, 1987). Nevertheless, even though it seems a simple process, it is particularly complex since the way our concepts are arranged through mental nodes has to be observed taking into account cultural and social aspects, time and space (see Langacker, 1991).

According to Lakoff and Johnson (1980), our conceptual system plays a relevant role in our lives; and, what is more important for our purposes, this conceptual system is basically metaphorical. For these authors, metaphors are not mere linguistic structures but conceptual structures mapping two semantic domains in such a way that TARGET DOMAIN IS SOURCE DOMAIN (5). What is really relevant in the light of this theory is how a concept is metaphorically structured. Lakoff and Johnson (1980) claim that metaphor serves to understand and to experience a thing in terms of another; thus, it can be thought that metaphors can define reality by means of a network of entailments that might highlight or hide certain features according to the preferences of the writer or speaker. They are vehicles to define reality and truth by means of a conceptual system.

2.2.1. Types of conceptual metaphors

These authors consider that there are different types of conceptual metaphors. As a basic classification, they claim that there exist conceptual metaphors that have been
conventionalised, or what is the same, metaphors that provide structure to the ordinary conceptual system of a culture, and metaphors that are outside that conventional system, that is, metaphors that are imaginative and creative (139).

Within the study of conceptual metaphors, we should distinguish between different types according to the domains involved. Some metaphors can be based on a particular structure, such as structural metaphors, that according to Lakoff and Johnson (1980: 14) are those conceptual metaphors where a concept is metaphorically structured in terms of another, that is, what is adopted from the source domain into the target domain is a specific structure. A typical conceptual metaphor of this kind is COMMUNICATION IS SENDING (10). Another type is orientational metaphors, where a whole system of concepts is organised with respect to another; these metaphors are also known as spatial metaphors since they are basically based on spatial orientation, as in HAPPY IS UP or GOOD IS UP (14). These kind of conceptual metaphors are normally based on experience, that is, source domain and target domain are linked by an experiential base. Finally, there are also ontological metaphors where we pick up our experiences and identify them as entities or substances, mainly based on our experience of substances and physical objects (25). Within this type of metaphors, Lakoff and Johnson (1980) include different subtypes, in particular they claim that there are entity and substance metaphors, where source domain is an entity normally bounded by a surface, such as THE MIND IS A MACHINE (28); container metaphors, where abstract objects are conceptualised in terms of containers, as in the case of ‘I put a lot of energy into washing the windows’(31); and personifications, where the object is specified as a person as we see in examples such as INFLATION IS AN ADVERSARY (34).
In general, the types of metaphors are varied and highly dependent on the social context. According to Lakoff and Johnson (1980: 160), metaphors are imposed by powerful institutions and provide true beliefs. For these authors, truth depends upon understanding, and understanding is a question of conceptual metaphors. This means that the power of metaphors goes even beyond the conceptualisation and falls into the domain of power and ideology. Indeed, metaphor selection may be governed by persuasive interests, since metaphor choice can be motivated by ideology (Chateris-Black, 2004: 11). The speakers use metaphors pragmatically, that is to persuade by combining cognitive and linguistic resources. As a result, a cognitive approach to metaphors is not enough to understand the motivation of the use of a specific metaphor. That is why in order to provide an accurate analysis, it is necessary to combine this cognitive approach with the CDA proposals.

2.2.2. The organisation of knowledge: networks of meaning and frames

According to Lakoff (1987: 69), we organise knowledge by means of ‘idealised cognitive models’. These models are basically created by human beings, since they do not exist in nature, and provide a network of meaning that links different conceptual categories to create a web of interconnected categorisation. On this basis, when we approach a new concept, an absolutely new phenomenon, we need conceptual metaphors to understand it. However, metaphors cannot be regarded as the only cognitive element that is present in the formation of a new network of meaning. Apart from these basic structures the receiver may also include peripheral information to enlarge and enrich the new cognitive model. Different conceptual structures are involved in conceptualisation. The concept of frame is of special interest to the formation of a new cognitive model. It should be assumed that in the configuration of a
new cognitive category, many cognitive processes are involved. On the one hand, we can find conceptual metaphors, but also other kinds of cognitive background will also be included within the definition of a new concept. As will be shown in chapter 5, media discourse, and specifically the examples upon analysis in the present paper, does not only provide the readers with an accurate amount of conceptual metaphors that conforms the basic conceptual model of the atomic energy, but it also presents interconnected information that is relevant to complete the network of meaning that is under construction in these texts.

Cognitive linguistics provides different theories to explain how a new mental model is built. Among the most interesting proposals we can find the notion of conceptual blending proposed by Coulson (2006). For this author, this conceptual blending consists of a collection of cognitive operations for combining different domains. We adapt cultural models to our personal models by means of conceptual blending. Conceptual blending is related and interconnected to conceptual metaphors. In fact, conceptual blending is composed of a small set of processes such as analogy, metaphor and many other phenomena. Understanding meaning consists of the creation of a blended cognitive model from different input models. Blending implies the activation of different cognitive models in order to create a network of interrelated meaning.

The reason that led me to include Coulson’s (2006) notion of conceptual blending in my research is that by means of blending the receiver is not only exposed to conventionalised conceptual metaphors but he also includes spontaneous and novel conceptualisations in the new cognitive model. Conceptual blending accepts the idea of a common space or blending, where information from different domains is included. That is, the formation of new concepts that will generate new mental models is not a
mere question of mapping between two different domains, as in conceptual metaphors, but a more complex process where different structures from diverse domains can be integrated. In sum, blending theory assumes that a varied kind of mappings can be merged to create a particular meaning. As the author claims, ‘indeed, conceptual blending theory is particularly well-suited for the analysis of persuasive efforts that involve the combination of a number of different kinds of mapping’ (Coulson, 2006: 196).

The use of conceptual blending facilitates the integration of various domains. On many occasions, by means of this blending the receiver filters the information, which has been taken from a shared cultural model, into his personal model. The notion of cognitive blending can be complemented by Fillmore’s (2006) theory about frame semantics. According to this author, whenever a novel schematization is introduced, information can be transferred from an already known frame onto the new situation. This view is similar to the idea of conceptual blending in the sense that different frames can contribute to the formation of a new mental model. However, Fillmore (2006) considers that these frames have to be at least partially understood by the reader as to create the proper and desired category in his mind. Indeed, Fillmore claims that a frame is a system of different interconnected words in such a way that to understand one of them, the receiver has to be able to understand the entire network. That is, these frames have to be socially shared by a group as to work efficiently at the cognitive level, since a word represents a social experience. This idea connects with Van Dijk’s (1998, 2004) theory about social cognition and context models. I would like to argue that frames configure networks of meaning within a mental model, but they are, in a sense, ideologically constructed. The ideological context in which frames are generated is crucial to observe how cognition and ideology work together.
3. IDEOLOGY, MEDIA DISCOURSE AND THE ATOMIC ENERGY: PROPAGANDA AND PERSUASION

In the present section I will analyse the discourse of the atomic energy by focusing on the different linguistic devices used by William L. Laurence. Drawing on Van Dijk’s (1998) ideological structures in discourse I will focus on how the atomic energy and its creators are represented in these news articles in order to generate a positive view of the entire event. In particular, I will deal with topics at a global level, and with levels of description, lexicalization and style at the local level of these texts.

3.1. Global meaning: topic

As mentioned in section 2, topics summarize the text, providing the most important information; these macro-structures are used by the readers to get a global understanding of the text. As a general tendency in the headlines, which we will see in detail in following sections, William Laurence makes use of a particular lexicalisation that supply the texts with an air of magnificence and innovation. The atomic energy is presented as a powerful and new entity. These assumptions can be noticed in headlines and leads such as the following examples where the atomic bomb or the atomic energy is considered as a benefit for Americans:

(1) WILL MANUFACTURE GOLD (Oct 24, 1939).

(2) With This Elemental Creation of Matter, Energy Can Be Used to Escape Gravity’s Bond.
But apart from the positive representation that apparently was needed to make the readers to accept the new energy, the author provides the articles with an atmosphere of mystery that can also be signalled at this macro-level in examples such as:

(3) Atoms broadcast secrets to science (Dec 30, 1939).

(4) Atomic factories incredible sight (Sep 29, 1945).

(5) ‘Martian’ Set-up Amazes Even Scientists as ‘Impossible’ Factors Materialize (Sep 29, 1945).

A final remark should be made regarding an interesting lead that is repeated in some of the articles under study where William Laurence, legitimatising his position, presents himself as an authoritative figure. Legitimation, according to Van Dijk (1998: 255), is the speech act of defending oneself and it is accomplished within the frame of institutional backgrounds. Whenever people justify their actions it is because they know that another sector of the population may disagree or attack them by what they have done. In the following leads, we can see how William Laurence tries to justify himself as an authoritative figure that knows what he is dealing with.

(6) Mr Laurence, science writer for THE NEW YORK TIMES and Pulitzer winner, is a special consultant to the Manhattan Engineer District, the War’s Department’s special service that developed the atomic bomb.

(7) Following is the first of a number of articles by a staff member of THE NEW YORK TIMES who was detached for service with the War Department at its request to explain the atomic bomb to the lay people. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.\(^3\)

\(^3\) The author uses italics in the articles.
Macro-structures account for a summary of the major and most relevant information that has to be understood. These headlines and leads may predispose the audience to start reading the text with a positive image of the atomic energy and by extension of the atomic bomb. Besides, the leads referring to the author are also crucial to a favourable positioning of the reader with regards to the figure of the journalist. This will be the general tendency in these articles. However in order to show that these texts aimed to be a persuasive instrument, we need to move into a more detail analysis of the local level.

3.2. Local meaning

As I have already maintained, the topic of these articles is mainly the atomic energy and by extension the atomic bomb. The purpose of this section is to show how in a micro-level structure the atomic energy and the atomic bomb are represented as something positive and good for the American population by means of different discursive structures.

3.2.1. Levels of description: prominence of the atomic energy

Van Dijk (1995b) argues that information can be modified according to the ideological need of the author by displaying it more or less prominently in the news stories. The general pattern, in almost every text, is to proclaim the virtues of a new energy that has been created by a selected group of American scientists. In a first stage, especially in the two texts from 1939, the author is hypothesising about the future energy; in none of these two texts reference is made to the danger of the atomic radiations. Just in a line Laurence claims that:
The core information within Laurence’s articles is basically related to the atomic energy and how American scientists created it; there are also articles that focus on the atomic bomb, and that present a detailed account of the process of the bombing. In both cases, the emphasis is put on the processes of the production of the atomic energy or atomic bomb. Details about the political and historical context are not included, and if the enemy is mentioned, are just in minimised instances. Just one of the articles seems to talk overtly about the Japanese enemy (U.S. ATOM BOMB SITE BELIES TOKIO TALES, Sep 12, 1945), and even in that text, the description appears to be adapted to Laurence’s purposes. In this article, the author claims that the enemies are complaining about the effect of the atomic bomb on the Japanese population. The description of the supposed damages is short, the side-effect of the atomic bombing are ignored or dismissed by the author.4

(2) (...) ‘that persons entering Hiroshima had contracted mysterious maladies due to persistent radioactivity’ (Sep 12, 1945).

Besides, Laurence considers that the claims of the Japanese are just mere propaganda, and for that reason their claims should not be taken as serious complains:

(3) (...) ‘the Japanese are still continuing their propaganda aimed at creating the impression that we won the war unfairly, and thus attempting to create sympathy for themselves’ (Sep 12, 1945).

Laurence does not provide a detailed account of the effects of the atomic bomb, and when he includes something relative to the people that were killed, he immediately

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4 Actually, this is one of the mayor claims against Laurence and THE NEW YORK TIMES. For more information see Keever, S. (2004)
introduces certain positive aspects to make a contrast that dismisses the negative effect of people being killed by the atomic bomb:

(4) ‘While many other people where killed, many lives were saved, particularly American lives. It ended up the war sooner. It was the final punch that knocked them out. Otherwise they might have kept on fighting for a longer period’ (Sep 12, 1945).

As we see, Laurence’s purpose is not related to the moral issue of the atomic bombing, not even is the author pretending to create a political justification. The theme is the atomic energy and by extension its actual uses by means of the atomic bomb. In this sense, the description is focused on the atomic energy/bomb and supplies readers with a detailed scientific account such as in:

(5) (...) ‘the catch was that the atoms of U-235, as found in nature, were inextricably mixed with the atoms of ordinary uranium of atomic weight 238 (U-238), the former constituting only seven-tenths of 1 per cent of the mixture. Since both forms of uranium are twins possessing the same chemical properties. (Sep 29, 1945)

(6) (...) ‘by sending out radio waves of very high energy, the atoms and molecules absorb those radio waves corresponding to the energies of their own waves. By determining the amount of the ratio waves absorbed, the frequencies and energies of the atomic and molecular ratio waves can thus be established in a few seconds instead of 1.000 to 100.000.000. (Dec 30, 1939)

(7) (...) ‘with an input of only fifty kilowatts to the radio-frequency oscillator of the new apparatus, Dr. Laurence reported today, cores of heavy hydrogen atoms (deuterons) were sent hurling out of the apparatus in a tremendous beam with energies of 16.000.000 volts, while nuclei of helium atoms, weighing twice as much as the deuterons, came out with the unbear of energies of 32.000.000 volts. (Dec 30, 1930)

The extracts show that the author was interested in presenting facts. Actually, the information provided includes extensive references to numbers such as in:

(8) Balls travelling with energies of 100.000.000 to 200.000.000 (Oct 24, 1939)
(9) 32.000.000 Volta attained (Oct 24, 1939)

(10) Projectiles carrying energies from 100.000.000 to 200.000.000 (Oct 24, 1939).

By the use of numbers along with scientific terms Laurence appears to present the atomic energy in an impartial and scientific way.

However, this precise scientific account is intermingled with a more emotional narration of the facts that Laurence has witnessed; and it is this emotional account of information that is the most ideologically loaded and the most powerful tool contributing to create a positive view of the new atomic energy. Among the emotional description related to the atomic event, the following examples show how unnecessary emotional information is included to stress the importance of the atomic energy or the atomic bomb to American society. People are presented as clapping hands or dancing out of joy:

(11) (…) ‘they clapped their hands as they leaped from the ground—earthbound man symbolizing a new birth in freedom—the birth of a new force that for the first time gives man means to free himself from the gravitational pull of the earth that holds him down’ (Sep 26, 1945).

(12) (…) ‘the little groups that hitherto had stood rooted to the earth like desert plants broke into a dance, the rhythm of primitive man dancing at one of his fire festivals at the coming of spring’ (Sep 26, 1945).

These examples contrast with the previous ones where accurate data were provided. Nonetheless, both ways of providing detailed information are necessary to create the proper atmosphere of fantasy and scientific research that the atomic energy involved. Laurence is configuring an interesting image of the bomb; on the one hand, the writer presents the event in scientific terms. On the other hand, in order to move readers, the
The journalist includes a set of emotional ingredients, which may be irrelevant for the development of the story, but still, appeal to the feeling of the in-group readers.

Apart from the prominence of the topic of the atomic energy or atomic bomb among the rest of the issues implicit in the articles, Laurence includes other irrelevant information related to the participants in the events. According to Van Dijk, ‘many ideological implications follow not only because too little is being said, but also because too many, irrelevant things are being said about news actors’ (1991: 114). Even though all this information might be regarded as irrelevant, is crucial to the main purpose of the texts. It is interesting to notice that one of the most important features of these articles is the glorification of the participants, which in essence are the Americans individuals. The fact that a detailed list of participants and information about their age, jobs, or even address is included can reinforce the notion of authority and pride—these men are part of the group. This idea of authority could be understood under the light of legitimisation. That is, Laurence was trying to justify the use of the atomic bomb. For that reason the journalist needs to represent the participants as important people:

(13) Captain Beahan has the awards of the Distinguish Flying Cross, the Air Medal and one Silver Oak Leaf cluster, the Purple Heart, the Western Hemisphere Ribbon, and two battle starts [...] The navigator on the Great Artiste is Captain James F. Van Pelt Jr., 27, of Oak Hill, W. Va. The flight engineer is M/Sgt. John D. Kuharek, 32, of 1054 Twenty-second Avenue, Columbus, Neb.; S/Sgt. Albert T. De Hart of Plainview, Tex., who celebrated his thirtieth birthday yesterday, is the tail gunner; the radar operator is S/Sgt. Edward K. Buckley, 32, of 529 East Washington Street, Lisbon, Ohio. The radio operator is Sgt. Abe M. Spitzer, 33, of 655 Pelham Parkway, North Bronx, N. Y.; Sgt. Raymond Gallagher, 23, of 572 South Mozart Street, Chicago, is assistant flight engineer. (Sep 9, 1945)

(14) In addition to General Groves who represented the United States Army, the group of experts conducting the tour included Prof. J. R. Oppenheimer, who directed the scientific research and development of the bomb; Prof. Kenneth T. Brainbridge of Harvard University, who was in charge of the historic test explosion that gave the go ahead signal for the atomic bombing
of Hiroshima and Nagasaki; Dr. Victor R. Weisskopf, theoretical physicist of the University of Rochester (N.Y.); Prof. Robert F. Bacher of Cornell University, Dr. Richard W. Dodson, radiochemist of Pasadena, Calif.; Dr. Louis H. Hempelmann, radiologist of St. Louis, Mo.; Dr. J. G. Hoffman of Buffalo, and Major John Ferry, radiologist, of Oak Ridge, Tenn. (Sep 12, 1945).

(15) Here early that Sunday afternoon gathered Maj. Gen. Leslie R. Groves, Commander in Chief of the Atomic Bomb Project; Brig. Gen. T. F. Farrell, hero of World War I, General Groves’ deputy; Prof. Enrico Fermi, Nobel Prize winner and one of the leaders in the project; President James Bryant Conant of Harvard; Dr. Vannevar Bush, Director of the Office of Scientific Research and Development; Dean Richard C. Tolman of the California Institute of Technology, Prof. R. F. Bacher of Cornell, Col. Stafford L. Warren, University of Rochester (N.Y.) radiologist, and a host of other leaders in the atomic program (Sep 26, 1945).

3.2.2. Lexicalisation

When analysing lexis, one is looking for particular word selection that stresses certain features and conceal others. Van Dijk (1998) argues that lexicalisation is a crucial strategy for ideological purposes. Wolf and Polzenhagen support this view by stating that ‘the expression of ideology is, as concerns lexis, rather a matter of the selection of lexical items than an aspect of word meaning in itself’ (2003: 251-2). William Laurence seemed interested in providing a particular image of the atomic energy. In fact, a positive representation of the event is found at all the linguistic levels under study. This is a persuasive structure where the purpose of discourse is to change the social representation of an event, or to be more specific, to create a specific social representation of the new event of the atomic energy (Van Dijk, 1998: 245).

Considering that lexicalization implies a personal selection moved by particular interests that can be aligned within the scope of a specific ideological frame this structure is relevant for the present ideological analysis. This subsection analyses the
lexical characterisation of the atomic energy, the atomic bomb, along with their creators, that is, the scientists involved in the experiments. The analysis of data shows that the atomic energy and the atomic bomb, are not only represented in positive terms, but also in terms that make clear allusion to the notion of new, of revealed secrets, and to the notion of something tremendous and powerful, as we can see in the following subsections:

(i) Positive representation of the atomic energy

W. Laurence makes use of positive lexis when he talks about the atomic energy or the atomic bomb. With this strategy, Laurence is relocating the atomic energy in the domain of the biggest quests fulfilled by man, and he is doing so by means lexis examples. Some of the most relevant cases I have found are captured in the following extracts:

1. A project for the building of the most stupendous atom-smashing machine so far conceived by man. (Oct 24, 1939)
2. The greatest weapon yet devised (Oct 24, 1939)
3. Larger enough to produce the greatest explosion on Earth (Sep 9, 1945)
4. The mightiest weapon ever made by man (Sep 26, 1945)

(ii) Positive representation of the American scientists

We have seen that a positive representation of the atomic energy was required to create a favourable opinion about it. Besides, the audience needs to identify the bomb as part of the group; for that reason, the creators have to be highlighted not only as positive but also as part of the group. Laurence, not only praises the work of the group of scientists, but also reminds the audience that they are American. With this simple
strategy the author is satisfying one of the principles of ideological and persuasive discourse, namely creating group identity:

(5) Professor I.I. Rabi of Columbia University, one of the world’s foremost experimental physician (Dec 30, 1939)

(6) A drama in which our scientists, with the Army Corps of Engineers as director, were working against time to create an atomic bomb ahead our German enemy. (Sep 26, 1945)

(7) More that 300 scientists were involved in the tests, including a number of Nobel Prize winners and scores of the world’s leading physicists, chemists, radiologists, meteorologists, mathematicians and explosive and ballistics experts. (Sep 27, 1945)

(8) One of the historic moments came on Tuesday, July 3, when a group of young physicians, who had learnt to tame the wildest elemental force in nature, brought the active material to the point the call ‘criticality’5. (Sep 27, 1945)

(iii) The idea of new

Along with the use of a positive representation of both the atomic energy/bomb and the creator of the engine, Laurence’s articles present a systematic use of certain lexical items that work to reinforce the positive view of the atomic energy and the atomic bomb. One of these positive representations is conveyed by the use of the adjective ‘first’ that denotes coming before all the other things or people in a series or ‘for the first time’ used; or by the adjective ‘new’ that is defined as recently made, built, invented, written, designed etc6.

5 In examples (7) and (8) the author does not specify that the scientists are Americans, however the global meaning of the article leads the reader to interpret that these scientists are part of the in-group, and thus the reader recognises them as Americans.

(9) (...) the new colossus among atom-smashers, when it is completed, will make it possible for the first time such a terrible assault to the nucleus of the atom (Oct 24, 1939).

(10) Dr. Rabi demonstrated a new and highly ingenious apparatus and method that make it possible for the first time for man to tune in on these cosmic messages which the atoms and molecules of the universe have been sending out without interruption since the beginning of time (Dec 30, 1939).

(11) This historic ground in New Mexico, scene of the first atomic explosion on earth and cradle of a new era in civilization (Sep 12, 1945).

(12) The elemental flame, first fire ever made on earth that did not have its origin in the sun, came from the explosion of the first atomic bomb (Sep 26, 1945).

(iv) The revealed secrets

Laurence makes numerous allusions to the secrets that have been revealed by the scientists that worked at the atomic project. The noun secret can be defined as ‘something that is kept hidden or that is known about by only a few people’. As we will see later on, the notion of being only known by a few people makes the bomb an exclusive element possessed by the American.

(13) (...) the new machine for prying loose the secret of the cosmos was described by Professor Ernest O. Laurence of the University of California (Oct 24, 1939).

(14) By means of the atomic radio transmitters and receivers, on the other hand, it becomes possible for the first time to study the secrets of the forces within the atom with the atoms are in their natural normal state (Dec 30, 1939).

(15) With these atomic radio receiving sets, Dr. Rabi reported he and his associated at Columbia had listened in on a number of broadcasts by the various elements that revealed for the first time many fundamental secrets about the nature of the tremendous cosmic forces within the cores of atoms (Dec 30, 1939).

http://www.ldoceonline.com/dictionary/
v) The notion of tremendous and powerful

Laurence also presents the atomic energy and more specially the atomic bomb as a powerful device that is assumed to be a menace to the enemy. This aspect is also relevant to the purpose of this study; it may be argued that the American people had to be proud of the new energy, they had to consider it as part of their identity as a group. By including the notion of powerful and terrifying the author reinforces the idea that this device can be used as a weapon against the enemy ‘full of great promise’ (see example, 18):

(16) It reveals, even at glance, the tremendous power of the atomic explosion that blasted earth over a radius of 800 yards from the centre (Sep 12, 1945).

(17) It showed that by far the majority of deaths within the radius of the explosion’s effectiveness had been caused by the tremendous power of the blast (Sep 12, 1945).

(18) It was like the grand finale of an almighty symphony of the elements, fascinating and terrifying, uplifting and crushing, ominous, devastating, full of great promise and great forebondings (Sep 26, 1945).

3.2.3. Style

So far the analysis has shown the positive representation of the atomic event. The atomic bomb was described as something powerful, innovative and good created by Americans for the improvement of the community’s needs. However, certain features regarding the particular style of Laurence’s texts should be included in this chapter to complete the study of ideological structures.
(i) **Storytelling: the adventure**

Laurence addresses himself as a direct witness that is narrating a story to the layman\(^8\); he does so by presenting the events as adventures carried out by heroes. The fact of presenting the participants as heroes helps readers to create a positive view of the event. In a sense, this is a patriotic move where the heroes of the nation undergo a difficult quest and finally win. However, what is interesting in these examples is that William Laurence includes himself among this group of adventurers. By doing so, his narrative is endowed with credibility; the readers are going to trust more easily on someone that is part of the nation’s heroes. This point of view can be simply understood by looking at the following examples:

1. **there were about nineteen of us in that strange caravan, travelling silently and in utmost secrecy through the night on probably an unusual an adventure** as any in our days (Sep 26, 1945).

2. These were the ‘mesa-men’ on the march, dwellers in the ‘caves’ in the interior of atoms, **pioneers explorers** of vast new continents in hitherto forbidden realms of the cosmos, **builders of the civilisation of tomorrow** (Sep 26, 1945).

3. **A convoy of trucks** took us to the supply building for the special equipment carried on **combat missions**. This included the ‘Mae west’, **a parachute, a lifeboat, an oxygen mask, a flak suit and a survival vest** (Sep 9, 1945).

4. The visitor from the outside [Laurence himself is a visitor] finds himself in a state of constant amazement, seeing one ‘impossible’ after another materialize before him. He finds himself **on a journey through a scientific wonderland**. All around him are ‘such stuff as dreams are made on’. To all the intends **he is a visitor on Mars** (Sep 29, 1945)\(^9\).

5. **We, too, were headed for adventure, Argonauts on the way to a golden Fleece** richer by far than Jason ever found (Sep 26, 1945)

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\(^8\) More information found at section 3.1. Global level: topics.

\(^9\) To clarify that the author refers to himself a note has been inserted in the example.
(ii) The mysterious atmosphere

Laurence strengthens this notion of an adventure endured by a group of young American scientists by including certain lexical style that emphasises the atmosphere of mystery and fear that normally surrounds any adventure. It may be argued that this lexical style could be irrelevant for the purpose of the articles; however, Laurence decides to make use of it probably in an attempt to create a fantastic story around the atomic bombing. Far from being neutral, with this strategy the author succeeds in describing the atomic energy and more specifically the atomic bomb as a fantastic element. The following examples show evidence of my claim:

(7) **Threatening black skies** torn open at intervals by **great lightning flashes** (Sep 9, 1945).

(8) The night was **cloudy and threatening**, with only a few stars here and there breaking through the overcast (Sep 9, 1945).

(9) Our great ship took some heavy dips through **the abysmal darkness** around us. (Sep 9, 1945).

(10) I noticed a **strange eerie light** coming through the window high above the navigator’s cabin and I peered through the dark all around us I saw a **startling phenomenon**. (Sep 9, 1945)

(11) It looked as though we were riding the whirlwind **through space** on a **chariot of blue fire**. (Sep 9, 1945)

(12) **The night was dark** with **black clouds** and not a star could be seen. Occasionally a **bolt of lightning** would rend the sky and reveal for an instant the flat semi-desert landscape.
(iii) The use of pronouns

As we have seen up to here in this section, style is relevant to create a particular atmosphere that would generate a particular interpretation. There are also other features such as the pronouns selected by W. Laurence that should be analysed here. Van Dijk (1998) claims that people acquire ideology if they have already learnt to be a group member by thinking in terms of ‘we’ and ‘them’, once this aim has been fulfilled the individual will be subjected to the values and rules of the group, participating in inter-group interactions and having access to social resources. As I have already stated, one of the principal aims of these texts was to underline the identity of group and incorporate the atomic energy as an in-group value. By means of an extensive use of the pronouns ‘we’ and ‘our’, Laurence makes the readers to accept the atomic bomb or the atomic energy as an in-group value, generating the feeling that one should be proud of the atomic energy and more specially of the atomic bomb. However, not all the pronouns work here at the same level, Laurence uses ‘we’ when referring to himself and others, to make explicit that he is also part of the selected group of authorities witnessing the events; a group that can be considered as a “privileged sub-group” of the main set, the American population, as in these examples:

(13) where we solved the secrets of translating the fabulous energy of the atom into the mightiest weapon ever made by man (Sep 26, 1945).

(14) we were on the road to the fabled golden Seven Cities of Cibola (Sep 26, 1945).

(15) we started circling. We saw little towns on the coastline, heedless of our presence. We kept on circling, waiting for the third ship in our formation (Sep 9, 1945).

(16) we are in our way to bomb the mainland of Japan (Sep 9, 1945)
In contrast, when Laurence is using ‘our’ he is referring to the whole of the American population. We can see how it works in the following examples:

(17) the mightiest man-made thunderbolts meant life for many thousand of our fighting men (Sep 27, 1945).
(18) But this interplanetary visitor found that in the course of three years our scientists and engineers has built an ‘Atomland-on-Mars’ (Sep 29, 1945).
(19) a drama in which our scientists, with the Army Corps of Engineers as director, were working to create an atomic bomb ahead our German enemy (Sep 26, 1945).
(20) Most spectacular of all, our scientists and engineers have contrived, by the greatest miracle of modern alchemy, to create to entirely new elements (Sep 29, 1945).
(21) Japan, the land of our enemies (Sep 9, 1945)

This section has focused on the ideological features that contributed to the representation of the atomic energy/bomb as positive and powerful. The next chapter examines the conceptual patterns that underlie the new definition of atomic energy and atomic bomb.
4. THE CONCEPTUALISATION OF THE ATOMIC EVENT

Up to here the present study has analysed different discursive features that help to support the original hypothesis that Laurence’s articles were ideologically constructed to improve the image of the atomic energy, after having being used against civil population by the American Army. Another interesting aspect is the fact that the writer seems to create an authorized definition of the new atomic energy. Given that William Laurence’s discourse had enough authority, readers may assume the author’s opinions as true beliefs. In this sense, Laurence’s discourse is also creating a cognitive model of the event by providing a unique definition of the atomic energy and the atomic bomb. The interesting thing about this configuration is the way the author transcends the barrier between the ideological discourse and the cognitive formation of a new concept. Laurence uses a huge amount of different metaphors to describe the atomic energy and the atomic bomb. I could have included these metaphors as part of the rhetorical aspects of discourse, as suggested by Van Dijk (1998); however, as metaphors are involved in the conceptualisation of a new event, they do not only operate within the scope of ideological discourse.

New events, mostly when they are abstract and unknown, are difficult to define. It seems that Laurence tried to provide the audience with an accurate definition as to make them understand the whole event of the new energy. This definition is basically, though not exclusively, as we will see in the next section, founded on metaphorical mapping. By means of conceptual metaphors, it was possible for the readers to understand the event of the atomic energy or the atomic bomb on the basis of illustrative domains, identifying the atomic energy with significant imagery such as mythological

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10 It is considered “unique” since the lead presents the author as the only witness that can explain to lay people what the atomic energy or the atomic bomb was about.
entities, outer space objects, fire etc. That is, by means of these metaphorical mapping the receivers can create their own and personal cognitive model. In the present section I attempt to analyse all the metaphors used by Laurence to describe the atomic energy and the atomic bomb. I have divided them into conventionalised metaphors and cultural-based metaphors, which are more culturally bounded to a determined context and ideology.

4.1. Conventional conceptual metaphors

The present section will focus on those conventionalised metaphors that in a way or another are related to our experience of the world. The purpose of this analysis is to see how certain general criteria are applied to the concept of atomic energy or atomic bomb to conceptualise it as part of a prominent domain that is connected to our spatial or personal experiences of the world.

(i) THE ATOMIC BOMB/ENERGY IS A COSMIC OBJECT

We can agree that atomic energy was an abstract entity, and an unknown phenomenon at that time. The reader needs to identify this event by means of conceptual metaphors, by using source domains that are already familiar to him/her. One of the most representative metaphors used by Laurence is the one that uses the outer space as source domain. The use of the domain of outer space provides the atomic energy with a veil of unknown and fantastic connotations. By outer space we understand ‘the space outside the Earth's air, where the planets and stars are’\textsuperscript{11}. Laurence selects elements from this domain to create conceptual metaphors where the source domain can

\textsuperscript{11} Longman dictionary of contemporary English online version. Ibid
be a cosmic object. On certain occasions he refers to the atomic bomb defining the object as a meteor. Meteor is defined as ‘a piece of rock or metal that travels through space, and makes a bright line in the night sky when it falls down towards the Earth’\textsuperscript{12}. With this definition, the receiver first understands the atomic bomb as a natural entity, following the parameters proposed by Lakoff and Johnson in their definition of ontological metaphors (1980: 25). Besides, the event is wrapped in the veil of mystery provided by a situation where an unknown object approaches the Earth. Some of the most prominent examples are the following:

\begin{enumerate}
  \item I watched the assembly of this man-made \textit{meteor} during the past two days (Sep 9, 1945).
  \item Laurence also uses the sunrise as the source domain; the sun is obviously part of this general domain that I have denominated outer space. The sun is a powerful symbolic image used by ancient cultures as a synonym of power\textsuperscript{13}. Apart from this symbolic vision, the sun is the source of life in our planet. Conceptualising the atomic energy as the sun entails the new abstract domain with power and strength:
  \item It was a \textit{sunrise} such the world has never seen, a great green \textit{super-sun} climbing on a fraction of a second to a height of more than 8,000 feet (Sep 26, 1945).
\end{enumerate}

On other occasions the allusion to the outer space is made by means of locating the atomic energy within a planet, as if the atomic energy were a product of that planet; to be more specific of Mars. In this example, Laurence is referring to the plants where uranium is processed. These plants are conceptualised by the author as if they were

\footnotesize
\textsuperscript{12} Longman dictionary of contemporary English online version. Ibid
\textsuperscript{13} See Greek mythology, the sun is Apollo and he is a powerful God. (Ovidio, \textit{Metamophosis})
Mars; by means of this metaphor, the readers understand that the atomic energy is a Martian element. The notion of outer space is used to understand the exceptional quality of the experiment:

(3) To all the intents, he is a visitor on Mars (Sep 29, 1945).

(4) There are mammoth plants in ‘Atomland-on-Mars’, situated on a semi-desert site fifteen miles northwest of Pasco (Sep 29, 1945).

(5) This spot is the most ‘Martian’ of all the places in ‘Atomland-on-Mars’ (Sep 29, 1945).

(ii) ATOMIC BOMB/ENERGY IS A NATURAL ELEMENT

Sometimes to describe abstract elements, the writer or speaker may use conceptual metaphors based on physical natural elements. William Laurence also uses this kind of conceptual metaphors. The conceptualisation of the atomic bomb as a natural element reinforces the notion of the atomic bomb as a powerful entity. Consider the following examples:

(6) The new-born mountain in the distance, a giant among pigmies against the background of the Sierra Oscuro range (Sep 26, 1945).

(7) A vibrant volcano spouting fire to the sky (Sep 26, 1945)

(8) Up it went, higher, higher, a giant mountain born in a few seconds instead of millions of years quivering convulsively (Sep 26, 1945).

As we can see, in examples (6) and (8) by means of lexical support, it is not just a mountain, but also a giant mountain; by doing so, Laurence is endowing the conceptualisation with an air of magnificence. Something similar happens in example (7), where the whole sentence is very graphic since the author is referring to vibrant and
spouting volcano. Again, the strength is magnified by means of the lexical selection made by the author.

(iii) THE ATOMIC ENERGY IS A LIVING ENTITY

The present subsection analyses those metaphors that use the domain of living entities. Within this domain we can distinguish a varied amount of different types of beings embedded in the general concept of living entities. It can be argued that the most prominent of these cognitive metaphors is personification. Lakoff and Johnson consider that personification helps to understand non-human entities in terms of human beings and their experiences (1980: 33-35). In Laurence’s articles one can find diverse examples where the atomic bomb is conceptualised as a person performing actions associated to human beings, as the use of the verbs in the following examples shows.

(9) It touched the multi-colored clouds, pushed its summit kept rising until it reached a height of 41.000 feet (Sep 26, 1945).

(10) Atom gun to tear world veil (Oct 24, 1939).

(11) The Big Boom came about 100 seconds after the Great Flash—the first cry of a new born world (Sep 26, 1945).

As one can notice in these examples, there is the implicit assumption that the atomic energy is a human being, since in order to touch it is required to have hands, to push a certain degree of volition is assumed, and to tear requires someone who purposely tears. The first cry of a new born is directly associated with a human being just born at that instant.

Besides, Laurence uses other types of living entities as source domain. An interesting example is that where the atomic energy and the atomic bomb is conceptualised as a wild animal. On several occasions the author makes use of the conceptual metaphor ATOMIC BOMB IS AN ANIMAL. In this case, the receiver is
able to understand the new element as an irrational and dangerous entity, as in the following examples where the atomic energy is conceptualised as a wild animal breaking its chains:

(12) An elemental force freed from its bonds after being chained for billions of years (Sep 26, 1945)\textsuperscript{14}.

(13) It kept struggling in an elementary fury, like a creature in the act of breaking the bonds that held it down (Sep 9, 1945).

Besides these instances where the atomic bomb is conceptualised as an animal by the association of animals with captivity, Laurence goes a step beyond and uses the domain of the fantastic, turning the atomic energy into a fabulous monster by means of the conceptual metaphor ATOMIC ENERGY/BOMB IS A MONSTER. Monsters are defined as imaginary or ancient creatures that are large, ugly, and frightening\textsuperscript{15}. The fact that a monster is a creature led me to include this kind of metaphors in this section:

(14) It was a living thing, a new species of being, born right before our incredulous eyes (Sep 9, 1945).

(15) It was as though the decapitated monster was growing a new head (Sep 9, 1945).

(16) The roar echoed and reverberated from the distant hills and the Sierra Oscuro Range near by, sounding as though it came from some supramundane source as well as from the bowels of the earth (Sep 26, 1945).

As noticed on the examples, the connotations are much more powerful than those regarding just animals. In these examples the atomic bomb is a new species of being

\textsuperscript{14} Consider that the elemental force is depicted by Laurence as if it were an animal by the activity that it seems to be performing.

\textsuperscript{15} Longman Dictionary of Contemporary English. Online version: http://www.ldoceonline.com/
never existing before, a creature that is probably not of this world. Besides, as can be observed from the above examples, the aim of all these metaphors conceptualising the atomic energy as a living entity is to represent a non-human entity as human or alive (Lakoff and Johnson 1980: 33). The audience needs to understand what atomic energy is, and conceptualising the atomic bomb as a living entity simplifies the process since we can imagine the event as being as a creature, behaving like a human being or even like a supernatural entity. As we will see in the last chapter, this selection is not at random, but based on persuasive interests. Thus, the image of a horrible monster will prevail in the cognitive model under construction in the receiver’s mind.

4.2. Non-conventional cultural-based metaphors

So far, the study has been based on the analysis of conventional metaphors that are supposed to be rooted in our ordinary conceptual system, based on personal experience or on the basis of ontological principles. Apart from these metaphors there are other types of metaphors that are really relevant when analysing conceptual metaphor in the light of an ideological frame. According to Lakoff and Johnson, non-conventional metaphors are imaginative and creative and can give us a new understanding of our experience (1980: 139). From my point of view, these imaginative metaphors can be socially shared, and thus ideologically constructed. Only members of the in-group can fully understand the meaning and the intention of using particular source domains in the mapping. These metaphors, as they are culturally bounded, can become extremely powerful. In the present section I attempt to present some of the most relevant examples of imaginative or cultural-based metaphors that William Laurence

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16 See this idea in comparison with other types of metaphors used by Laurence, like ‘a cosmic element that comes from outer space’.
uses in his articles to define the atomic energy within the frame of social and cultural identity.

If up to here I have been describing the basic structure of the new cognitive model of the atomic energy, from now onwards, I will also be showing how the conceptualisation of the atomic energy is also ideologically defined.

(i) ATOMIC ENERGY IS A SACRED ELEMENT

Another interesting domain is that of the use of religion, which is a source for different metaphorical mappings within Laurence’s texts. The author uses different elements related to religion as source domains that provide the conceptualisation of the atomic bomb and the atomic energy with a veil of mysticism and respect. In some cases, the source domain seems to be part of a religious homily. Here the priests are preparing the sacred element where the readers understand the preparations of the bomb as a sacred process, some kind of divine element that is going to be used by a group of ancestral priests. For the purpose of the present research of connecting the creation of a cognitive model with ideology, this metaphor is crucial since instead of being afraid of the bomb, the reader will be proud of it, because it is a sacred element. The reader is not witnessing a religious ritual but identifying the atomic energy with part of a religious ritual:

(1) I watched the assembly of this man-made meteor, during the past two days and was among the small group of scientists and Army and Navy representatives privileged to be present at the ritual of its loading (Sep 9, 1945).
As the following example shows, the Holy Bible can be considered as a representative part of the most strong in-group values, since one of the most prominent values within American culture is religion:\(^{17}\):

(2) That cosmic fire that lighted earth and sky from hundreds of miles was a modern version of the Biblical handwriting on the wall to the Japanese and all would-be future enemies (Sep 27, 1945).

Laurence also conceptualises the atomic energy or the atomic bomb as a miracle. Miracle is defined as ‘an action or event believed to be caused by God, which is impossible according to the ordinary laws of nature’\(^{18}\). It is as if American scientists were Gods that will rule over the Earth by doing miracles by means of the atomic energy and more particularly of the atomic bomb. This notion of miracles is depicted in instances such as:

(3) This gigantic apparatus, the largest in the world today, was just recently put in operation […] and had already produced results that can be described by scientists here as veritable modern miracles—miracles which only yesterday, as it were, were regarded as dreams impossible of realisation (Oct 24, 1939).

As we have seen in the previous examples religion is a powerful source for conceptual metaphors. It can be said that religious connotations are a good strategy for the configuration of a powerful cognitive model since religion is based on the beliefs of a particular group of people. Using the religion domain, the author endows the whole event of the atomic energy with divine connotations, because in essence religion is ‘a

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\(^{17}\) Consider, for example, the expression ‘In God we trust’ to see to what extent religion is important within the in-group shared values.

belief in one or more gods”. By this metaphor the audience elevates the atomic energy to the category of divine element.

(ii) THE ATOMIC ENERGY/BOMB IS A MYTH

Following this pattern of creating an image of the atomic energy and the atomic bomb as if they were powerful divine elements, Laurence makes also use of the domain of mythology to conceptualise the new event. In certain instances, the author makes allusion to ancient religious figures that nowadays fall into the domain of myth. That is the case of certain references to The Titans. The Titans were “in Greek mythology, the first gods who ruled the universe, before Zeus became the most powerful god. They were thought of as giants (=like humans, but extremely large and tall)”20. So by using this metaphor the cognitive model is enriched since the image of mythological entities is very powerful. The following examples show how Laurence makes use of mythology:

(4) This new titan conceived by the mind of man, it is expected, at last provide man with the long sough for the philosopher’s stone (Oct 24, 1939).

(5) The titan of titan among atom smashers is to weight 2000 tons (Oct 24, 1939).

Besides, in relation to the mythical world we can also see how Laurence addresses the atomic energy as “the new colossus”:

(6) The new colossus among atom smashers, when it is complete will make possible for the first time such a terrific assault on the nucleus of the atom (Oct 24, 1939).

The Colossus is also a very powerful image; there is a clear reminiscence of The Colossus of Rhodes\textsuperscript{21}. Again this notion of God representation is latent in the mapping. As we see, by the use of the domain of myth the reader conceptualises the event as some kind of fantastic element.

(iii) ATOMIC BOMB IS AN AMERICAN ICON

We have already seen that Laurence might be trying to persuade readers of the benefits of the atomic energy. It can be argued that the purpose of William Laurence’s writings could be making people be proud of that new engine. In order to do so, the author would need to awake the audience’s interests by means of identifications that in a way or another should be related to the in-group beliefs, values or goals (Van Dijk, 1998). Probably with this purpose in mind, Laurence uses the domain of the American iconography to represent the atomic energy and the atomic bomb within this ideological frame. There are a few examples where the atomic bomb is represented by means of conceptual metaphors that have American icons as source domains. Even though there are just a few examples of this kind metaphor, they can be considered as worthy of analysis, since by means of these metaphors the atomic event is conceptualised within the domain of American iconography. Respect and pride are reinforced and included as nodes within the complex network of interrelated meanings that so far is being created by William Laurence. In the following examples “the atomic bomb is understood as “The Statue of Liberty” or “a living totem pole”:

(7) It took the form of the Statue of Liberty magnified many times (Sep 26, 1945).

\textsuperscript{21} Defined as ‘an extremely large ancient statue of the god Apollo on the Greek island of Rhodes. It was built to guard the entrance to the harbour, and was one of the Seven Wonders of the World. Longman Dictionary of Contemporary English. Ibid
(8) It was a living totem pole, carved with many grotesque masks grimacing at the earth (Sep 9, 1945).

(9) The entity assumed the form of a giant square totem pole.

(iv) ATOMIC ENERGY IS A SUPERNATURAL ENTITY

The metaphors studied in this section are similar to those studied in the previous section about the domain of the outer space, in the sense that they conceptualise the atomic energy/bomb as something that does not belong to the earth. Nonetheless, in this case the source domain is not necessarily a physical entity. Instead, Laurence focuses on the wonders of an unknown phenomenon. By the use of the domain of the supernatural, the author is making use of certain elements that belong to the domain of the supernatural. The receiver understands the bomb as a magic entity:

(10) At first it was a giant column that took the form of a supramundane mushroom (Sep 26, 1945).

(11) The feeling one gets on visiting these plants is something akin to a strange awareness of the supernatural (Sep 29, 1945).

In other examples, Laurence reinforces the notion of hellish or magic element, by conceptualising the atomic energy or the atomic bomb in terms of a hellish element. The purpose of Laurence when referring to “the bowels of earth” (see examples 12-14) might be to reinforce this idea of something that cannot be explained, which is powerful and, what is more interesting to the scope of the present study, something that the reader has to be afraid of. The atomic bomb is described as some kind of supernatural element that comes from the bowels of the earth, which evokes “the hell”. For that reason, the
new element will also be conceptualised as some kind of dangerous element. We see this idea in examples such as:

(12) And just at that instant there rose from the bowels of the earth a light not of this world, the light of many suns in one (Sep 26, 1945).

(13) Sounding as though it came from some supramundane source as well as from the bowels of the earth (Sep 26, 1945).

(14) A giant ball of fire rose as though from the bowels of the earth. (Sep 26, 1945).

(v) ATOMIC BOMB/ENERGY IS FIRE

Fire is a very symbolic element for many different cultures. The Dictionary of Symbolism provides the following definition of fire:

Fire consumes, warms, and illuminates, but can also bring pain and death; thus, its symbolic meaning varies wildly, depending upon the context of its use. It is often the symbol of inspiration, and yet it is also the predominant symbol of hell; fire is the only one of the four elements that human can produce themselves, so it bridges the connection between mortals and gods. Rituals often involve an eternal flame, and kindling a fire is equated with birth and resurrection22.

Fire is considered as a powerful element and also as a dangerous element that needs to be under control. When Laurence conceptualises the atomic energy or the atomic bomb in terms of fire the receivers understand that it is a dangerous element, but still they also recognize that the atomic energy, and by extension the atomic bomb as

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22 Dictionary of Symbolism
http://www.umich.edu/~umfandsf/symbolismproject/symbolism.html/F/fire.html
well, are tremendous sources of power. Laurence makes use of this conceptual metaphor on several occasions, as in the following examples:

(15) The elemental flame, first fire ever made on earth that did not have its origin in the sun, came from the explosion of the first atomic bomb (Sep 26, 1945).

(16) Man for the first time has the fuel for such a rocket. He stills lack the engine to utilize “This cosmic fire” (Sep 29, 1945).

(17) That cosmic fire that lighted earth and sky for hundreds of miles (Sep 27, 1945).

4.3. Towards a cognitive model of the atomic energy

So far I have tried to present both, the ideological and cognitive components of the representation of the atomic energy. Right now we can have an idea of the primary basic structure of the cognitive model of the atomic energy. This cognitive model is basically built by means of conceptual metaphors. In a first stage the atomic energy/bomb is defined in terms of conventional ontological metaphors (Lakoff and Johnson, 1980). Thus, the atomic energy is an object that belongs to the domain of the ‘outer space’. It is also a ‘natural physical phenomenon’, such as, a volcano. Besides, the author presents the new energy as a ‘new species of being’, thus reinforcing the idea that the atomic energy/bomb is a ‘newborn living entity’; or even describing the new entity as a ‘monster’. However, as I have previously argued, this selection is not at random. Far from that, William Laurence selects those metaphors to create an ideal image of the new energy and guides readers in their construction of the mental representation of the new event of the atomic energy and by extension of the new atomic bomb. First, by the use of the metaphors the readers understand that the scientists gave birth to the new creature, since they also assume that THE ATOMIC
ENERGY IS A LIVING ENTITY. As these scientists can be considered as part of the readers’ group, by extension, the creature becomes also their child. Once the author has satisfied the need of regarding the atomic energy as something that belongs to the group, a newborn member of the group; he now has to project a powerful image of the creature and its creators. For that reason, I consider that Laurence makes use of the metaphor ATOMIC ENERGY IS AN OUTER SPACE ELEMENT. By means of metaphors, he is conceptualising the atomic energy/bomb in terms of the unknown element associated to the outer space. What is more interesting, he provides this cognitive model with a strong sense of power. But the atomic energy is not only a powerful creature; it is also a threatening creature under the control of the group. That is, it is literally and figuratively speaking a weapon that the in-group can use against their enemies.

All these features, such as being +human/alive or being an outer element, are created by means of ontological metaphors that are generally understood even by non-members of the group, probably because, as argued by Lakoff and Johnson (1980), they are part of a set of conventional metaphors generally understood by everybody. However, apart from these metaphors there are also non-conventional cultural-based metaphors that enrich the basic structure of the cognitive model. Some of these non-conventional metaphors have the domain of religion as a general frame where different types of conceptual metaphors are included. By the use of source domains, e.g. the religious ritual, the Holy Bible or a miracle, which are inscribed within the general frame of religion, the author endows the model with respect and solemnity; now the atomic energy is something sacred. The metaphor ATOMIC ENERGY IS A SACRED ELEMENT works both as a persuasive element and as a cognitive strategy, working both at the level of social and personal cognition. Additionally, the present section has
discussed the metaphor THE ATOMIC ENERGY IS AN AMERICAN ICON. The analysis has shown that by means of this metaphor the in-group can recognise the atomic energy as part of the group and defines it as a sacred in-group value. Finally, it has been argued that the metaphor THE ATOMIC ENERGY IS FIRE is also relevant to emphasize the connection between the atomic energy and the domain of power.

To sum up, we can see how the cognitive model of atomic energy is organised by Laurence in terms of the following conceptual metaphors:

ATOMIC ENERGY IS

1. A COSMIC OBJECT
2. A NATURAL ELEMENT
3. A LIVING ENTITY
   i. A HUMAN BEING
   ii. AN ANIMAL
   iii. A MONSTER
4. A SACRED ELEMENT
5. AN AMERICAN ICON
6. A MYTH
7. A SUPERNATURAL ENTITY
7. FIRE

This metaphorical analysis could be considered a first stage to draw the cognitive map of the conceptualisation of the atomic energy. However, this investigation should undergo a further step and take into account other cognitive aspects apart from cognitive metaphors to complete the mental map that the articles are generating of the new event.
of the atomic energy. Such aspects can show evidence of the complexity one finds when analysing a mental model. A frame theory proves relevant to complete the model. The next section will take into account other cognitive mechanisms that also play a part in the configuration of the cognitive model proposed by Laurence.
5. IDEOLOGY, COGNITION AND DISCOURSE IN THE REPRESENTATION OF THE ATOMIC ENERGY

The present chapter intends to approach to the conceptualisation of the atomic energy and by extension of the atomic bomb as a network of interrelated meanings that consolidated the structure of the new mental model. Up to here, the study has analysed features of both the atomic energy and the atomic bomb indistinctly. Indeed, one of the assumptions of the present paper is that there is a single mental model where both the atomic energy and the atomic bomb form part of the same definition. The atomic bomb can be considered as a metonymic instantiation of the atomic energy where the product stands for the material that it is made of.

Laurence’s articles seem to have a persuasive function; nonetheless, they were also contributing to the creation of a new mental model since the atomic energy was some kind of new element that needed to be defined. As previously argued in chapter 2, the formation of the atomic domain comprises different frames. For Atchison, prototypical metaphors are crucial to understand word formation: ‘when humans consciously use metaphor they subconsciously follow certain guidelines. They tend to compare items that come from different semantic fields, which share minor but obvious characteristics’ (1987: 149). Lakoff and Johnson (1980) have also a similar view; in this case, they consider that our way of understanding new concepts is essentially metaphor-based. To certain extent, these assumptions can be regarded as compatible; however, the way we organize concepts in our mind is not a random process, as Croft & Cruse (2004) argue. Instead, we associate certain terms within a network of meaning because they are interconnected by our experience of the world. To understand the concept the interpreter needs to look at the entire web of meanings (Fillmore, 1982a: 111). According to
Fillmore, a frame is a system of categories organised in accordance with a motivating context (2006: 381). That is, different domains at different levels and under a motivating context, which in this case is an ideological one, created a network of meaning for the concept of atomic energy. This study wants to go beyond the basic conceptual metaphors provided by Laurence to define the new atomic energy, and see whether any ideological discourse structure might also be involved in the process of creating the mental model of the atomic energy.

It can be accepted that part of a general definition of the atomic energy provided by William Laurence is mainly based on metaphorical mapping. Thus, an initial network of meaning is created by linking different basic conceptual metaphors so as to draw the first level of what will be the mental model of the atomic energy. However, after the analysis carried out in this paper, it can be noticed that metaphors are powerful elements in the formation of a new mental model, but they may not be sufficient material so as to create a network of meaning that will serve as a mental definition for the new entry. The purpose of the present research is to prove that this mental definition is not only based on metaphors, but also aided by other kind of ideological structures found in those new articles, which provide the receiver with enough additional information so as to consolidate the complex structure of a mental model.

The major claim of this research is that certain linguistic devices do not only perform an ideological function, but they are also an important part of the cognitive structure. What the analysis shows, is that notions such as “new”, “powerful”, “secrets” or “tremendous” are used both at the ideological level of discourse and at the level of cognitive representations, where they enrich the network of the atomic energy by means of new frames that add new interrelated meanings to the mental model. All these discursive features invoke particular semantic frames that are as relevant as those basic
metaphors that gave the first cognitive sketch of this new mental model. For that reason, it can be considered that when analysing the mental definition generated by these news articles, both cognitive metaphors, prominence of the positive description of the atomic energy in the articles, lexicalisation and even the features of the style used by Laurence have to be taken into account in order to provide an accurate design of the mental model of the atomic energy.

In the following figure (Fig. 1), we can see how different semantic frames are intermingled and create the mental definition of the atomic energy. As suggested in chapter 2, this new mental model can be regarded as a type of conceptual blending where different frames at different levels interact to create a new meaning. Coulson’s (2006) idea of conceptual blending helps us to understand the internal mechanisms that operate in the construction of a mental model. When Laurence depicts the new energy, and especially the atomic bomb, he uses specific ideological discourse structures and conceptual metaphors but there is also an interaction between discourse and cognition that allows those structures used at the ideological level, especially lexis and style, to work also as part of the cognitive definition:
Fig. 1: Basic cognitive network of the meaning of “the atomic energy” and by extension of “the atomic bomb”.

Celeste Moreno
Originally Laurence described the event using concepts such as ‘newness’, ‘power’, or ‘adventure’ just because he might want to convince the audience of the benefits of having used the atomic bomb against the enemy; this is just an ideological use of discourse with a persuasive function. However, Laurence, as the first official narrator of the new event, generates the first official mental definition of the atomic energy. For that reason, ideological structures with a persuasive function would also influence the cognitive level, as we can see in the figure. That is, these ideological structures are going to reinforce particular meanings that will be incorporated in the network of meanings of the new concept of atomic energy. It can be claimed, then, that there is an interaction between discourse and cognition that makes the new mental model of atomic energy attracts meanings from different frames. Interestingly, these frames are motivated by the persuasive function of the articles. In this way, it can be stated, as Fillmore (1987) does, that different frames from different origins are put together with a shared interest to configure a new network of meanings. This network of meanings might have been ideologically constructed by means of discursive structures with a persuasive function, but these structures can also work as a cognitive device that serves to mentally define the new concept. Indeed, Fillmore (2004) claims that looking at the frames within a single domain is an excellent way for understanding the reasons that motivated them, that is, the motivations that lead the creator of the mental model to select certain frames instead of another.

Conceptualisation is not a neutral process that takes place on the receivers’ mind; far from that, the receiver creates a network of interrelated meanings that configure a complex and unified web of significance. Besides, when conceptualising a new event, the receivers are doing so within a social and ideological framework that is
going to condition the way they understand that new concept. It can be argued that ideological structures interact with cognition to become part of the mental definition of the atomic energy and vice-versa, cognition interacts with ideology to create an ideological reinforce a particular way of seeing the world. Following Núñez Perucha (2004), it can be argued that there is a bidirectional relation between discourse structures and cognitive structures. That is, the ideological structures are consistent with particular ways of perceiving the atomic event. They interact with cognition to become part of the mental model of atomic energy. When defining the new energy, the receivers will use those metaphorical descriptions, such as ‘THE ATOMIC ENERGY IS A MONSTER’, ‘THE ATOMIC ENERGY IS A COSMIC OBJECT’, or ‘THE ATOMIC ENERGY IS A NATURAL ENTITY’; still, these receivers will also include other structures such as ‘the atomic energy is new’, ‘the atomic energy is the treasure that our heroes got after undergoing an adventure’, ‘the atomic energy is our secret’, or a general appreciation such as ‘the atomic energy is good for our nation’. All these connotations are crucial information that cannot be left out in the study of the mental model of atomic energy. The new mental model is a complex web of interconnected meanings that configures the mental image of the atomic energy. This complex web has been generated by means of the interaction between discourse and cognition with the purpose of creating a positive view of the atomic energy. As argued by Fillmore (2004), to totally understand the meaning of a concept, the receiver needs to be familiar with the domains used. In this case, these domains are known by the receivers because they are mostly part of the in-group beliefs. Laurence’s readers were probably able to reconstruct the ‘ideal mental model’ designed by this author because they were also capable for recognising the frames that constitute the mental model of the atomic energy. To understand the entire event of the atomic energy, one has to understand each of the
single frames that operate within the cognitive model. Taking into account the socio-historical context in which the texts analysed here were written, the discursive ideological structures will be as relevant as conceptual metaphors so as to generate the proper model in the receiver’s mind. This mental model, ideologically constructed, could be used as part of the in-group values and beliefs.
6. CONCLUSION

The starting point of this investigation was the assumption that the first news articles about the atomic energy written by W. Laurence were ideologically constructed so as to produce in the readers’ mind a positive reaction about the atomic energy. It was also thought that these texts generated a definition of the new event of the atomic bomb and the atomic energy. Laurence’s articles were generating a new mental model that could be used by the receivers as the mental definition of the atomic energy.

The present paper had two clear linguistic objectives. On the one hand, the study intended to analyse the ideological discourse structures of the articles; on the other hand it also aimed to show how these structures were contributing to the construction of the mental model of the atomic energy. The main interest of the study was to analyse the ideological effect of discourse on the creation of the mental model of the atomic energy. The ultimate purpose was to draw the ideo-cognitive map of the atomic energy created by means of Laurence’s articles.

Once it was assumed that conceptual metaphors were crucial to create a new mental model, it was also considered that, given the circumstances of the texts, certain ideological structures could also be part of the mental definition. For that reason, the paper analysed both the ideological structures that were used by the author to persuade the readers as well as the conceptual metaphors found in those texts. The major claim of the paper was that there is a connection between cognition, ideology and discourse in order to create a triangle of meaning that facilitated the understanding of the network of meanings that operates within the mental model of the atomic energy.

In order to carry out this analysis, a multidisciplinary framework was used. First the study made use of the theory of Critical Discourse Analysis, specifically Van Dijk’s
socio-cognitive approach, which suggests the study of certain ideological discursive structures that are likely to have a persuasive function, and also claims that cognition plays a relevant role within ideological discourses. Besides, the study approached Cognitive Linguistics, where different theories were put together in order to explain the complex configuration of a mental model. At this cognitive level, the study used some notions proposed by Aitchinson (1987) and Lakoff and Johnson (1980) about the conceptualisation of new events; the study also included other cognitive theories such as those offered by Coulson (2004) and Fillmore (1982, 2006) since their proposal about the existence of networks of interrelated meaning—conceptual blendings in Coulson’s terms—that operate within mental models could throw light on one of the major questions of this research: the possibility of an interaction between discourse and cognition to generate a particular understanding of the atomic energy.

At the discursive level, the findings showed that Laurence represented the atomic energy and the atomic bomb as something positive for the American society, which may explain why at that time media discourse was characterised as propagandistic. The author used particular lexicalisation, narrative devices and a prominent focus on the atomic energy and the atomic bomb in his texts. However, as it was claimed in chapter 5, those first news articles created also a new mental model, since they also provided a definition of the new event.

At a cognitive level, findings showed that the mental model of the atomic energy was made of different structures. At a basic level, one can find a set of different conceptual metaphors, such as THE ATOMIC ENERGY IS A MONSTER, THE ATOMIC ENERGY IS A COSMIC OBJECT or THE ATOMIC ENERGY IS A SACRED ELEMENT, which aided the reader to understand the new event. However, not only do conceptual metaphors play a relevant role, but also certain ideological
structures would become part of the network of interconnected meanings implicit in the mental model of the atomic energy. As claimed in chapter 5, there are certain ideological notions such as “new”, “powerful”, “secrets” or “tremendous” that operated also at the level of cognitive representations generating new frames that added new interrelated meanings to the mental model.

After observing the findings this research can be concluded by stating that conceptualisation is a complex process where the receiver configures a web of interrelated meanings with a diverse origin. Within this network of meanings different ideological structures interact with cognition and become part of the mental definition of the new concept. As a conclusion, this paper has demonstrated that the discursive ideological structures when used to generate a mental model in the receiver’s mind are as relevant and necessary as those conceptual metaphors used to provide a primary definition of the event. For that reason, the conclusion that we can reach at this point is that ideology, discourse and cognition interacted in the creation of the mental model of the atomic energy.

Still, some questions remain for further study. For example, one interesting aspect that this study supports is the fact that conceptualisation might be ideologically guided. In this sense we could further investigate the conditions in which our mental models of representation of events are generated; as in the case of the atomic energy, an issue not exempt from debate nowadays, we could analyse to what extent the way we perceive the atomic energy is still under Laurence’s influence. It can be argued that many essential concepts embedded in that complex web of interconnected meanings have prevailed as cognitive features within an established mental model stored in our mental lexicon. Beliefs may become obsolete; however, cognitive models might be
maintained with slight modification through time and space. To what extent is nowadays the American society’s model of the atomic bomb still related to its original definition? The model may vary depending on the degree of involvement showed by the receiver, the personal experience of that receiver, and the context in which discourse is generated. In the case of the model of the atomic energy, one cannot ignore that it was (re)produced by means of an ideological discourse.

A further line of research could be to continue this study by incorporating the entire process of transformation performed in the American cognitive model of the atomic energy, since it seems to have been part of the culture and history of this country from the beginning of the Atomic Era. Nowadays the atomic energy or ‘nuclear energy’ is still a touchstone issue on political and social affairs. A diachronic study would shed light into this controversial matter, which has been influencing external and internal political affairs.
APPENDIX

HUGE NEW ATOM GUN TO TEAR WORLD VEIL

$750,000 Machine Will Smash Out Secrets With Shots of Up to 200,000,000 Volts

WILLIAM L. LAURENCE

Huge new atom gun to tear world veil

pg. 28

HUGE NEW ATOM GUN... TEAR WORLD VEIL

By WILLIAM L. LAURENCE Special to THE NEW YORK TIMES.

The new machine, which the scientists call an atom bomb, is a giant jet-powered rocket that can travel in a circling flight in a matter of minutes. It is powered by a new type of motor, which burns a special fuel and is driven by a high-pressure oxygen jet. This motor is so efficient that it can be used to propel a ordinary automobile for hours at a time.

The scientists say that the new machine will be able to reach any point on the earth in a matter of minutes, and that it can be used to travel to any place in the world in a matter of hours. It is powered by a new type of motor, which burns a special fuel and is driven by a high-pressure oxygen jet. This motor is so efficient that it can be used to propel a ordinary automobile for hours at a time.

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Seething Pillar of Fire Rose 60,000 Feet From Blast—Planes High Up Rocked

ELECTRICAL STORM ON TRIP

Two Other B-29's Escorted Strike Ship—Enemy Flak Met Going In to the Target

Mr. Lawrence, science writer for THE NEW YORK TIMES and a Pulitzer Prize winner, is a special consultant to the Manhattan Engineer District, the War Department's special service that developed the atomic bomb.

By WILLIAM L. LAURENCE

WITH THE ATOMIC BOMB MISSIONERS TO JAPAN APOLLO 9 (Delayed)—We are on our way to bomb the mainland of Japan. Our flying contingent consists of three specially designed B-29 "Superforts," and two of these carry no bombs. But our lead plane is on its way with another atomic bomb, the second in three days, concentrating in its active substance the explosive energy equivalent to 20,000 and, under favorable conditions, 40,000 tons of TNT.

We have several chosen targets. One of these is the great industrial and shipping center of Nagasaki, on the western shore of Kyushu, one of the main islands of the Japanese homeland.

I watched the assembly of this man-made meteor during the past two days, and was among the small group of scientists and Army and Navy representatives privileged to be present at the ritual of its loading in the "Superfort" last night, against a background of threatened flak, as the skies turned open at intervals by great lightning flashes.

It is a thing of beauty to behold, this "gadget." In its design went millions of man-hours of work. It is without doubt the most concentrated, intellectual effort in history. Never before had so much brainpower been focused on a single problem.

This atomic bomb is different from the bomb used three days ago with such devastating results on Hiroshima.

I saw the atomic substance before it was placed inside the bomb. By itself it is not at all dangerous to handle. It is only under certain conditions, produced in the bomb assembly, that it can be made to yield up its energy, and even then it gives only a small fraction of its total contents—a fraction, however.

Continued on Page 35, Column 2
Atomic Bombing of Nagasaki

The story of Atomic Bombing of Nagasaki begins with the tragic attack on the city on August 9, 1945. The destruction caused by the bomb was immense, leaving behind a city that was virtually destroyed. The city was left in ruins, with the majority of buildings and structures reduced to ashes. The attack resulted in the loss of countless lives, with estimates ranging from 70,000 to 80,000 people. The blast and the ensuing fire engulfed the city, leaving behind a devastated landscape.

The city was never the same again. The aftermath of the bombing was a testament to the destructive power of nuclear weapons. The city was left in a state of shock, with the aftermath of the bombing causing a profound impact on the citizens of Nagasaki. The bombing not only ended the Second World War but also marked a turning point in the history of the world, setting a precedent for the development of nuclear weapons.

In conclusion, the bombing of Nagasaki was a tragic event that left behind a legacy of destruction and loss. The city was never recovering, and the memory of the bombing continues to haunt the residents of Nagasaki. The story of the bombing of Nagasaki is a reminder of the devastating power of nuclear weapons and the need for peace and security in the world.

William L. Laurence of The New York Times (1878-1944) and Wilkes, N.J., public relations officer, is in his second position as the first Allied officer to land in Japan after the Atomic Bombing of Nagasaki. He is in the Pacific before taking off again over Japan.

The story of Atomic Bombing of Nagasaki is a reminder of the destructive power of nuclear weapons and the need for peace and security in the world.
Tests on New Mexico Range
Confirm That Blast, and
Not Radiation, Took Toll

By WILLIAM L. LAURENCE
Special to THE NEW YORK TIMES.

ATOMIC BOMB RANGE, New Mexico, Sept. 9 (Delayed)—This historic ground in New Mexico, scene of the first atomic explosion on earth and cradle of a new era in civilization, gave the most effective answer today to Japanese propaganda that radiations were responsible for deaths even after the day of the explosion, Aug. 6, and that persons entering Hiroshima had contracted mysterious maladies due to persistent radioactivity.

To give the lie to these claims, the Army opened the closely guarded gates of this area for the first time to a group of newspaper men and photographers to witness for themselves the readings on radiation meters carried by a group of radiologists, and to listen to the expert testimony of several of the leading scientists who had been intimately connected with the atomic bomb project.

The ground, visited for the first time even by Maj. Gen. Leslie R. Groves, over-all director of the atomic project, since that historic morning of Monday, July 16, gave awesome testimony on a number of subjects.

It revealed, even at a glance, the tremendous power of the atomic explosion that had blasted the

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earth over a radius of 800 yards from the center. It gave mute testimony of the enormous temperatures developed at the split instant of the explosion, fusing the earth for a radius of 1,200 feet into a great glass-like cloud resembling fine lace. It told of the enormous pressure that had compressed the earth below an area of 400 yards into a giant bowl that reached a depth of twenty-five feet.

The visitors saw a scene of desolation and devastation that made the surrounding semi-desert face a green, fertile oasis. Both from the ground and from the air, the sight is an unforgettable one.

Before entering the area while care was taken to pull over our shoes were furnished to us. This, General Groves explained, was to make certain that some of the radioactive material still present in the ground might not stick to our soles.

We walked over the ground we were preceded by radiologists carrying Geiger counters, sensitive instruments that respond instantly to any radiation in their vicinity, revealing on a graduated dial the exact quantity present.

Instruments Belle Japanese

The Geiger counters supplement about one-tenth the ground's given by the ground's appearance. They showed that less than two months after the explosion the radiation on the surface had dwindled to a minute fraction, safe for continuous human habitation.

Only in the center of the saucer, over an area about fifty yards, was the radiation higher than the standard tolerance dose for continuous human habitation. In this area it examination of their present statements reveals.

Thus, at the beginning, the Japanese described "symptoms" that were not rigidly defined, having been pointed out that the radioactive material on the surface was constituted only an inch. It describe appear to the radiologist to be relative easily to remove this radioactive material and make the ground safe for immediate habitation.

At the rate the radiations have diminished during the past two months, it pointed out, the entire area will be free of them within a relatively short time.

The atomic explosion in New Mexico was from a steel tower only 100 feet from the ground, whereas the bombs over Hiroshima were dropped from a bomber and exploded in the air from a much greater height, a scientific point out. Detonation at that height over the Japanese cities, he said, greatly reduced the absorption of the gamma rays in the ground, so that there were fewer of these radiation in Japan than in New Mexico.

The findings just received by General Groves, his next in command, who is now in Japan with a group of American scientists to study the effects of the bombs on the scene. The studies of the American scientists are still in the preliminary stage. General Groves stated that, according to General Groves, Japanese sources now admitted that eleven days after the bomb had pulverized Hiroshima, the radiations there was much stronger than at Hiroshima, the meaning, he added, that you could live there forever.

Most of the casualties in Hiroshima, these Japanese sources now admit, according to General Groves, were owing to the blast and its consequence of build-ings and flying debris and to burns from radiat heat and subsequent fires. By far the majority of the deaths came from the blast, they believe.

Persons in the center of the explosion, General Groves stated, "could be killed by fifteen different ways," but all the evidence indicates that it was the blast. The same Japanese sources emphasize that there is no present danger in Hiroshima from surface radiations. Vegetation growing on the Hiroshima grade grounds supports this belief.

Joe's Propaganda at Work

"The Japanese claim," General Groves added, "that people died from radiations. If this is true, the number was very small.

"However, any deaths from gamma rays were due to those emitted during the explosion, not to the radiations present afterward. In the area where people could be killed by radiation they were killed other cases, particularly civilians.

"While many people were killed, many lives were saved, particularly American lives, to end the Japanese threat. It was the first punch that knocked them out. Otherwise they might have kept on fighting for a long time.

The Japanese are still continuing their propaganda aimed at creating the impression that we won the war unfairly, and thus applying to create sympathy for themselves and milder terms, an examination of their present statements reveals.

Thus, at the beginning, the Japanese described "symptoms" that were not rigidly defined, having been pointed out that the radioactive material on the surface was constituted only an inch. It describe appear to the radiologist to be relatively easy to remove this radioactive material and make the ground safe for immediate habitation.

"Relief" Workers Misnamed

The Japanese, for example, had sent out a report that relief workers sent into Hiroshima after the blast had received radiation burns. "We now know these people were not Japanese sources," General Groves went on, "that these were actually workers who were sent into Hiroshima before the bombing to evacuate the city on prior order. They simply were hurt in the original blast and were not examined as they should have been.

In addition to General Groves who represented the United States Army, the group of experts conducting the tour included Prof. J. R. Oppenheimer, who directed the Los Alamos research and develop-
Drama of the Atomic Bomb
Found Climax in July 16 Test

Following is the first of a number of articles by a staff member of The New York Times who was detached for service with the War Department at its request to explain the atomic bomb to the lay public. He witnessed the first test of the bomb in New Mexico and, on a flight to Nagasaki, its actual use.

By WILLIAM L. LAURENCE

The Atomic Age began at exactly 5:30 Mountain War Time on the morning of July 16, 1945, on a stretch of semi-desert land about fifty airline miles from Alamogordo, N. M., just a few minutes before the dawn of a new day on this earth.

At that great moment in history, ranking with the moment in the long ago when man first put fire to work for him and started on his march to civilization, the vast energy locked within the hearts of the atoms of matter was released for the first time in a burst of flame such as had never before been seen on this planet, illuminating earth and sky for a brief span that seemed eternal with the light of many super-suns.

The elemental flame, first fire ever made on earth that did not have its origin in the sun, came from the explosion of the first atomic bomb. It was a full-dress rehearsal preparatory to use of the bomb over Hiroshima and Nagasaki—and other Japanese military targets had Japan refused to accept the Potsdam Declaration for her surrender.

The rehearsal marked the climax in the penultimate act of one of the greatest dramas in our history and the history of civilized man—a drama in which our scientists, with the Army Corps of Engineers as director, were working against

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Drama of the Atomic Bomb Found Climax in New Mexico Test

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time to create an atomic bomb ahead of our German enemy.

The project was launched on the end of the first act of this story, with the beginning of the Manhattan Project, a code name for the Manhattan District of the U.S. Army Corps of Engineers, which involved the development of the first nuclear weapons.

In the summer of 1942, General Leslie Groves, the project's director, brought together a team of scientists, engineers, and workers to build the world's first atomic bombs. The site chosen for this project was the Alamogordo Proving Ground in New Mexico.

The first test of an atomic bomb was known as the Trinity Test. It was conducted on July 16, 1945, at the Alamogordo Proving Ground. The bomb, nicknamed the Gadget, was detonated at 5:29 a.m. on that date.

The explosion was seen from miles away, and it created a mushroom cloud that rose high into the sky. The blast was heard 300 miles away, and it remained visible for two days. The test was a success, and it demonstrated the power of atomic weapons.

The test led to the development of the hydrogen bomb, which was tested in the Baker Test on July 17, 1945. The Baker Test was a demonstration of the feasibility of a hydrogen bomb, which is a nuclear weapon that uses the fusion of lighter atomic nuclei to release energy.

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PASSING THE BRICKS TO HELP REBUILD A FRENCH SEAPORT

By WILLIAM L. LAURENCE

The New York Times

Thursday, September 27, 1945

A French seaport reeled under the impact of the war, its buildings burned, its docks destroyed, its industries ruined. But today, with the help of the Americans who fought for it, the French are building a new town on the site of the old. They are using the bricks that were taken from the old town to build the new.

LIGHTNING BLEW UP DUMMY ATOM BOMB

By WILLIAM L. LAURENCE


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The Great Cloud of Fear

The great cloud of fear that grew more than eight miles wide to the east of Los Alamos on the morning of July 16, when the first atomic bomb was exploded, was as much as the town itself could bear. The cloud of destruction, however, was so vast that it covered the entire sky, blackening it all. The town was in a state of panic, with people running from the danger of atomic radiation.

The expenditure of man power in the explosion was immense. The force of the explosion was estimated at 18,000 tons of TNT, equivalent to the destruction of more than 1,000 tons of TNT. The force of the explosion was felt for miles around, and the shock was felt for miles below.

The news of the explosion caused a great stir in the town. People were anxious to know what had happened, and many went to the scene of the explosion to take a look. The town was in a state of chaos, with people running from the danger of atomic radiation.

The explosion was so powerful that it damaged many buildings, including some of the largest and most modern buildings in the town. The destruction of the buildings was a great loss to the town, and many people were left homeless.

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"Martial" Set-Up Amazes Even Scientists as 'Impossible'
Factors Materialize

First 'AMOUNTS' INVISIBLE

With this Elemental Creation of Matter, Energy Can Be Used to Escape Gravity's Bonds

Following is the fourth of a series of articles in the New York Times, in which the writer, a nuclear physicist, attempts to popularize some of the concepts that he feels are not well understood by the general public. He does this by using a variety of analogies and examples to illustrate the principles involved.

By WILLIAM L. LAURENCE

Few who, like your correspondent, who has spent many years of research in the field of atomic physics, are familiar with the work of the late Dr. Albert Einstein, are aware of the tremendous impact that his theories have had on our understanding of the universe. In his paper, "The Foundation of the General Theory of Relativity," Einstein presented a new and more comprehensive theory of gravity that has since become the basis for all modern physics. His ideas have had a profound influence on the development of the field, and they continue to be studied and debated by physicists around the world.

The author begins by stating that the new science of atomic physics is just beginning to be understood by the general public. He mentions that Dr. Einstein's theories are not yet widely accepted, but he believes that they will eventually be recognized as the foundation of our knowledge of the universe.

Einstein's work has also had a significant impact on the field of astrophysics. He showed that the presence of massive objects, such as black holes, can cause the fabric of spacetime to be warped. This has led to the development of a new field of study called gravitational lensing, which allows astronomers to use the distortions caused by these massive objects to study distant galaxies and other cosmic phenomena.

The author concludes by stating that the new science of atomic physics is just beginning to be understood by the general public. He believes that it will eventually be recognized as the foundation of our knowledge of the universe.
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