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HYPERTERMINOTICS – CONSIDERATIONS ON TERMINOLOGY ORGANIZATION[1]

Abstract

This paper concerns hyperterminotics, a word I have created by combining terminotics, hypertext and informatics. The necessary use of computer to process terminology hypertextually inclines me towards the use of the term hyperterminotics instead of hyperterminology. Hyperterminotics refers to the situations or processing, organisation and management of terms and terminologies through hypertextual facilities within a network. It is presented as a different way of organising knowledge. If hypertext still establishes relationships between nodes, it is not on a hierarchical scale. The internaute and designer are then considered in a process of endoculturation which varies according to their paradigm of navigation. There are as many paradigms as there are ways to understand terms (strategies of thinking) and to abstract from the phenomenal world. Studying this new way of processing terms allow us to demonstrate that the traditional linear way of representing knowledge cannot account for the "polyhedral" nature of the term.

1 Introduction

The General Theory of Terminology (henceforth GTT) has borrowed from other fields, such as philosophy, from which it has taken the Porphyrian tree (Porphyrius of Tyrus, R. Lull, and later F.Bacon), trying to give monoreferentiality to a medieval metaphor, the term. From linguistics it has borrowed, according to Juan C. Sager, theories about the lexicon and its structure and formation [...]"1. Since Eugen Wüster (1931), the terminological ideal has been to attempt to give one denomination to a concept (bi-univocity of the term). According to this aspect of terminology, the specificity of a terminological unit lies in its privileged relationship with other units in a field of knowledge and establishes a standardized model of knowledge representation. This

aspect of the GTT is part of the dominant problematics in artificial intelligence: knowledge representation systems. In this paper, I will try to demonstrate that the traditional linear representation of knowledge cannot account for the "polyhedral" nature of the term. This will lead me to talk about what I call hyperterminotics and give an overview of some new pathways taken by metaterminology, like the growth of interest in sociological and epistemological criteria of term aspects. Within metaterminology, hyperterminotics heralds emerging developments in the acquisition of terminology. This reflexion does refer to a range of various philosophical approaches, particularly regarding knowledge (epistemology), reality (ontology or metaphysics), and values (philosohy of culture).

2 Definition of Hyperterminotics

The term hyperterminotics borrows from Budin et al. (1994) who first used hyperterminology and terminotics (1977) (first used by B. Harris2 according to the information available) and later used in French by P. Auger and D. Gouadec). Terminotics contains in itself the notion of informatics and the suffix -tics, an aphaeresis from automatics, specific, says Caroline de Schaetzen to the automatised disciplines. She mentions[2] that once infomatics touches a sector of activity and knowledge, it creates multidisplinary micro-fields. I have created the term hyperterminotics which concerns the situation or processing, organization and management of terms and terminologies through hypertextual facilities within a network. Moreover this text deals with philosophical aspects of terminology processing through Internet. Until now terminology processing through computers has been the only way to process terms by the use of hypertext. The obligation of having recourse to neology is that no term until now refers precisely to the activity of organizing terminology on the web. The necessary use of computers to process terminology hypertextually inclines me towards the use, in a theoretical framework, of the term hyperterminotics, constructed by the combination of hypertext, terminology and informatics, instead of hyperterminology.

The hyperterminology should mark out the hypertextual processes like the corellates, the analogical links, etc. Finally, the need to create a new concept does not depend on the existence of lexical units having

various degrees of technicity but rather on the new ways of organizing it. That is the need of describing new terminological practices that lead to the creation of the concept: on one hand we must theorize about the uses, now frequent, of the hypertextual links, on the other hand, we must explain the concrete attempts, like the one of Cabré and Rojo realised at the IULA (Institut Universitari de Lingüitica Aplicada) to organize the terminology on the web from metaterminological hypotheses that leads then to new terminological practices.

3 Epistemological Considerations on Hyperterminotics - Computer and Metaterminology

Within the computational shift in linguistics in the 1970's (See Winograd quoted by Cook, 1994: 61), terminology has broken frontiers especially with the emergence of terminological data banks, which grew from 14 in 1978 to 80 in 1994 showing simultanously the rapid development of terminotics.

The hypertextual thought elaborated by Vannevar Bush in 1945 and metaterminology elaborated in the same years, share one belief about science, namely that knowledge grows cumulatively and has to be organised in such a way that it is easy to find. The hypertextual thought was founded on the idea of association and links. In hyperterminotics, a close relationship exists to both aspects (heuristic and epistemological) involved in terminology acquisition. John McCarthy (1985: 23) distinguishes between epistemological and heuristic aspects of Artificial Intelligence.[3] According to him, the former deals with WHAT information can be represented, while the latter focuses on HOW that information can be represented. Refering to this distinction, I believe that heuristic -multilinear (Abramson, 1995: 7) - possibilities made possible by engineering knowledge give new epistemological overviews on the "polyhedral" nature of the term.

4 Overview of Metaterminology Trends

The crucial issues raised by the new trends in terminology are at the same time challenging central orientations of occidental modernism (deconstructionism, post modernism, etc.). The treatment of terminol-

ogy in transdisciplinarity is implemented in a sociology of knowledge (See Robertson, 1996; Breton, 1992). The sociotermino-logical trends are taking part in those epistemological changes. In this respect L. Guespin (1990: 645) shows a series of differences between GTT and socioterminology: the focus on univocity versus the description of the various real scientific and technical speech interactions; wüsterians were "relying on a committee of specialists [...] to fix its terminology whereas on the other side, the socioterminological one, we have to deal with various uses of speech"; finally the GTT method classified terms in a conceptual system, while socioterminology uses discourse analysis in the various interactions which involves taking into account local practices of science and technology.

The sciences colloborate and borrow terms from other disciplines (creating scientific metaphors[4] (inter-domain metaphorical connections)). Judith Schangler says : "Soit des notions ou des constellations de notions déplacées hors de leur terrain d'origine et employées ailleurs, dans un autre champ de pertinence."[5] She calls this phenomenon ‚transferts métaphoriques'. On an other hand, the new ideas emerging in the social studies of sciences as well as vulgarisation, as part of modernists values (See Breton, 1992), bring to terminological theory new avenues promoted by socioterminologists, such as Gaudin (1993: 255) that the solely logical aspects were not able to give.

5 General Theory of Terminology

Wüster was not the first to demonstrate the possibility of ordering knowledge in univocal nomenclatures (Carl von Linné and others had elaborated logical structures well before), but he was the first one to theorize about the applications of the logical tool. In this aspect, to avoid ambiguity, we should call him the father of metaterminology rather than terminology The objective of the recognized founder of metaterminology, Eugen Wüster was very clear: promoting sciences with the help of a unified language. He wanted to offer unambiguous communication through descriptive records of terms and normalized terminologies. K. Opitz explains how it became a certain a solution to a certain sociolinguistic problem: "[talk about forging or masonry or farming was not easily in danger of misinterpretation. Only when our civilisation became more abstract and experience was partly replaced

by the civilisation became more abstract and experience was partly replaced by the less reliable imagination, a way had to be found to avoid the distorting influence of mass use of language. The technical term provided a way out of the dilemma for the specialist."[6]

The idea of bringing together all scientific disciplines in the same scheme (See Esteban, 1996) was part of a larger movement of esperantist ideas, investigations on language and reality (Felber 1994: 41) and the influence of logical positivism (Russel and Wittgentsein). According to Wüster, conceptual logic had clarified the relationships among concepts ordering them in such a way that a concept field appears (Oeser, 1994: 26). It was also responding to the social needs, socio-economical motivations in technical normalization of language, language planning and standardization and ideological transformations. Classical terminology theory is based on the equivalence between concepts and signs (univocity between sign and denotation[7]), precision, and coherence. Thus it underestimates the context. This positivist ideal was also near those of a contemporary, i.e. SČerba's theory of bilingual lexicography. Rita Timmerman says: "The scientific study of specialized vocabulary is confounded with the pragmatic activity of standardization. This urge for standardization is a by-product of objectivism, which is deeply rooted in the Western philosophical and cultural tradition."[8] In the onomasiological approach the hierarchical tree structure is developed and identified by the terminological definitions. Constituting an object is deriving it from other concepts. Following the Vienna School, Merten and the Belgian school represented by D. Blaimpain, Marc Van Campehoudt (Merten, 1992) among others have developed a research projet called Termisti which adopts such a paradigm but also relativize it by recognizing semantic variations in the units from one micro field to another one and between different languages. Even if they have opted for a descriptive work instead of the prescriptive one of Wüster, they still edify "hierarchized" notional nets.

6 Interpretation versus Representation/Organization

If we admit that representation of knowledge has a philosophical (which meaning do we attach to objects or concepts?) and a psychological sense (which relations, associations do we establish between these objects?) we must then consider hyperterminotics as dealing

more, in this aspect, with psychological considerations. On the other hand, hyperterminotics has the specificity of not establishing any hierarchical relationships between nodes. For this reason, we prefer not to use the operator representation that seem to us too near the notion of /hierarchisation/ and of /structured model/. But if it's not a representation of knowledge, how can we name the relations of the reticular net. Choosing the term interpretation, thus, would include those two previous senses of representation but would not express the idea of a set of nodes involved by the existence of a network. I believe that the term organization is more pertinent to describe analogical relationships between nodes. It has not got the sense of hierarchy, that normally expresses representation in terminology, and /system/ in its political and epistemological sense. Moreover, it takes for a hypothesis (Condamines, 1994: 32) the idea that the referent concerns perception and does not belong to a system as opposite to the concept. The weakness of Wüster was to believe that concept was equivalent to the linguistic system even though linguistic systems are not equal in all languages (Rastier, 1995: 40). Finally, after Lerat (1997: 11) we consider knowledge as an equivalent of information.

7 The Paradigm of Hyperterminotics

By using the paradigm of the specialised hypermedia knowledge organisation, recently developed in Spain[9] by the anthopologist Arcadio Rojo jointly with the linguist M. Teresa Cabré, an understanding is made possible. Rojo's reflexion on hypertext comes from his previous thesis (See 1992: 209ff) in which he discussed the conflict of ethics in the western world (which is connected with the dichotomical way of seing the things in Occident) and the engineering cultural invention influenced by the works of the American Robert Cavalier. Cabré (see her previous works on the diversity of terminology, terminology being understood as terminological unit and as metaterminology (theorical approach of terms) (1993: 31, 37, 82; 1996: 18)) says she has been influenced by the Catalan Antoni M. Badia i Margarit in his way of focalising objects of study from different perspectives. The next section deals with, among others, Rojo's notion of circular text and will try to measure the contribution of Cabré and Rojo to the recently developed theory of organizing terminology.

8 Linearity vs Circularity?

Many publications (Piotrowski, Rojo into others) relating terminology to epistemological considerations have highlighted the idea of non-linearity and non-sequentiality of hypertext[10]. In a certain fashion, hypertext can be considered as a text without a beginning or any end evoquing the doctrine of the eternal recurrence which has its roots in Greek philosophy[11] The encycopedists, like Ramon Lull, or other since Isidore of Seville[12] took spontaneously the figure of the circle, similar to the divine archetype where God is the center[13]. As says Thomas Walker, the system of organizing knowledge presented in the book known in English under the tittle ‚The Book of the Gentile and the Three Wise Men' (Libre del gentil e dels très savis) "when methodically applied to life's problems, was to achieve Llull's goals: to honor God and to unify all religions [...]" [14]

The literature on hypertext borrowed the figure of the circle and the eternal recurrence. In fact it is more the links themselves that make the network infinite, the text still being presented in a linear way. For this reason Rojo and Cabré preferred to call this new textual phenomena circular text (1996: 417). By adopting this point of view, we would then still have to deal with the ambiguity noted by Henri Meschonic (1996: 19) and Levy (1995: 203) between the openness and the closure of encyclopedic knowledge. We would then also have to specify the difference between the linguistic circularity of a dictionary, being the result of the dictionary as a text, which means closed on its own words[15], and cognitive circularity which seems to be specified more by sememes expressing openness. In this case the figure of the labyrinth should be preferred. Does circularity mean totality or an open-ended system?

Referring to Jacob Neusner's (1997: 375ff) article on paradigmatic versus historical thinking (which is chronological unlike the first one), we should not consider hypertext as a circular way, nor linear, of thinking but more on the basis of a cognitive and processing paradigm. I will define later what I mean by paradigm. A cyclical exploration of any hypertextual design would imply getting back to the beginning nodes and therefore stating that the previous exploration would appear again and so on ad infinitum and, therefore, that there is a center. On the other hand, de-linearized doesn't mean circularity as we can observe

in Budin et al. (1994). In their work on hyperterminology, they use de-linearized in the sense of de-contextualized (1994: 6) refering to the relationship between text and term, the former being linear and the latter, because it is just a fragmented unit of a text, is de-linearized. In this perspective, hyperterminology has no metaphysical, heuristic or epistemological implications but more graphical ones.

Cyclicality could be rejected in favour of a relational-reticular organization of terms together for two reasons:

a) because of the paradigmatic nature of terminology processing throughout hypertextual navigation or in the same way of endoculturation, which also restablishes criteria of cultural values and diversity of terms.
b) the sites are often unfinished. The frequent use of ‚under construction' or ‚waiting for the next visitor' makes the telematic text in itself an uncompleted, unachieved work unlike the published book (an exception is Lucien Leuwen, les Pensées de Pascal) that is, even if its a serial publication, has a certain idea of achieved work.
c) The web pages scroll. We do not see all the information of the various material of the nodes.

The metaphoric use of navigation (Netscape Navigator, Explorer) then reminds us of Francis Bacon's proficience referring to an idea of movement and march toward knowledge instead of a static expression of it (See Chatelain, 1996: 161, 169) as if the mind was building knowledge. In this aspect the traditional idea of an encyclopaedia doesn't fit perfectly in the sense that it had the pretention to describe all the knowledge available at that precise moment of the publication. In the terms of the philosopher P. Levy (1995: 176), we could have access to a space of knowledge instead to disciplines which are structured as territories or catégories disciplinaires (J. Schlanger, 1995: 581). The construction of hyperterminotics is thus related to a dynamic synthesis (like an open work) in perpetual movement of scientific and social activities. Hypertext then consists "en une structure d'interaction récursive entre textes (documents) et interprétations «temporairement stabilisées» (ou connaissances) destinée à produire de nouvelles élaborations sémantiques (des interprétations)" as says David Piotrowski (1996: 323). The metaterminology appears at an epistemo-logical encounter between

a) the creation of its own field in which the metalanguage is used to build the method;
b) the construction of any scientific field where it has the function of elaborating the conceptual framework of a field.

9 Hyperterminotics and Complexity - Description of Reality

The GTT has elaborated abstract knowledge ("systematicity", coherent knowledge) which up to now has not been able to deal with empirical considerations such as the complex description and definition of reality or referent. "A scientific lexicon [Kuhn] is constitutive of a phenomenal world in the sense that it creates a taxonomy of kinds corresponding to the concepts available to the speech community living in the phenomenal world" (Ahmad 1996: 9). Terminologists should then not use the word reality, understanding the world in itself, epistemically inaccessible to the cognizer. The theory of terminology has been also very weak, to talk about concepts describing formal realities. If the referent is abstract, what would be the concept then if we know that in conceptology, the concept exists always independently of the term. In philosophy the term often changes because the point of view is changing (conceptual neology) but not the phenomenon in contrast to terminology referring to technical fields (referential neology). This perception of reality in the nomenclature dealing with concrete objets has been the starting point of the consideration on the univocity of the term.

10 Expert Knowledge and Lexical Knowledge and Different Degrees of Scientificity

Hyperterminotics, concerned with the display of terminological data in a URL (Uniform Resource Locator) Web page, rejects the monoreferentiality of the term which tends to isolate fields of knowledge as developed by the School of Vienna. This new conception is an alternative to that of the GTT, not just by establishing different notional nets as adopted by TERMISTI in Belgium and by Mayer, Geer and Hanne (1990) or relating knowledge maps (two dimensional graphical displays) (Amer, 1994) which are still ranked; but also by relating

several views of the same domain (polyhierarchical relationships). In effect, some terms which belong to a field (such as economic policy) can also be used in the field of renewable energy[16].

The analysis of term units shows us that they do not appear just in specialized discourse. General dictionaries have often used literary texts to illustrate scientific and technical uses and senses (Candel, 1990: 47). An absolute opposition between lexem and terms then become unavailable. Since we know that specificity of the term is not unvariable (Phal quoted by Morgenroth 1994: 13), we should study terms holistically (Handwerker (1989), Budin et al. 1994: 3; Gentilhomme, 1994: 33) within the idea of science of complexity[17] admitting the double function of terms: by distinguishing lexical knowledge (sign-word) and expert knowledge (sign-term), (or "vocabulaire d'orientation scientifique" (Morgenroth, 1994: 75), by taking into account cultural values, discourse, level of discourse moving the interest toward text and multidimensionality[18]. We should also better define what we mean by knowledge, information, etc. Different types of studies have been made on the communities of a computer mediated communication.

11 Anthropological View

The hypertextual organization of knowledge allows us to use horizontal navigation between nodes of information linking with other web pages. Rojo, by borrowing concepts from Egyptian and Hinduist points of view of history and reality (the unity in the diversity – the major theme of the Upanishad – (Diaz, 1982: 17)) modifies the traditional criteria (vertical relation which concerns the level of inclusion in a category) used to define relationships between terms. As F. Gaudin argues, sciences must be considered not as fields, but as a net of nodes. (1993: 252) These new heuristic methods give an anthropological vision of terminology organization. Terms are no longer seen as describing a homogenized, standardized knowledge but rather on the plan of culture diversities (traditions) which use the transmission and teaching of terms as a process of endoculturation, acculturation. As says Eve Sweetser, we can "agree with those semanticists who consider meaning to be rooted in human cognitive experience: experience of the cultural, social, mental and physical worlds."[19] This point of view deals largely with considerations involved in the axis modernity/tradition as

the problem of the culture internationalization through the web. The process of endoculturation (acculturation) should be understood in a dynamic process of scientific vulgarization which take into account the culture of the addressees[20].

Jim Rosenberg thinks the phenomenon of hypertext certainly in a differents way, but it shows the alternative medium of thinking: "the proposal for hypertext as a medium of thought; for hypertext inside the infrastructure of language, is a proposal for an externalization of syntax analogous to the externalization of the nervous system manifested in computer network."[21]

In my view the easy access to intercultural computer-mediated communication - even though the quality of the web sites is very unequal - allows us to develop encyclopedic knowledge. Because the system doesn't support all the languages‘ typography, for example Arabic, culture is then expressed through a transliteration and sometimes, to be accessible to more internautes, translated into English. In a certain way, this means that people understand part of the culture through the eyes of another culture, a problem that provokes lexical gaps.

This necessary translation and the domination of English in the telematic edition makes us thinking that it is hard that the nature of information, the way it is represented are so intertwined that it is hard to affirm if it belongs to universal or tradition. Even if English is used to express cultures in which English is not an official language or a vernacular language, the texts are still being culturally motivated to be interpreted according to textual semiotics. The plurality of text linked together and consulted build a new text made of which is the result the total of all the little nodes of information recuperated from a site to another one. The construction of subjectivity is rather present in the process of surfing than in the traditional semiotic relation with the linear text. C. Galinski and W. Nedobity say: "les liens notionels sont aussi important en tant qu'éléments porteur d'information que les notions elles-mêmes en tant qu'unités spécifiques de connaissance et de pensée."[23] This is partly due to the fact of the reticular dispersion (interpreted within the philosophy of complexity and some ideas of French philosophers (Derrida, Wunenberger) of the knowledge involved by the hypermedia organisation.

12 Hyperterminotic: An Ethical Definition of Paradigm

Hyperterminotic is then considered as part of knowledge of invention for many reasons: first of all, terms have to be considered within the textual semiotics, e.g. the cultural, sociological and historical boundaries, also the fields in which they appear (See Candel 1993, Rastier). In other words, taking into account those aspects of the terms as if they are considered simply as lexical unit shall also make us reconsider our own definition of scientific culture within the hypothesis of the socioterminolgy. Secondly, the terminologist, the web-page maker and the "internaute" are viewed as designers (science of design (H. Simon)) in their relation to electronic edition. In this aspect, terminological creation (neonymy) and transmission are a part of a decision set concerning ethical values (human choices and responsability) that builds up the network. Perception (analysis of the situation) and decision (selection of the best road to take) are part of the differents phases of learning. Nancy K Baym says that "practice theories view culture as continually reproduced and altered through the behaviour of actors making practical choices."[24]

In this context, a term has validity, like an historical event (Simmel, 1995: 300), if it's fixed in a time, within a community of interpretation, and, with other nodes, it forms a unity of understanding according to the paradigm chosen by the internaute and the designer. But contrarly to the idea of the history with its rigid distinction between past and present[25], its careful connections form one to the other, paradigmatical view allows any analogical connections within the web "as a text ruled by the principle of universal analogy and sympathy"[26]

Building the network (the equivalent of domain tree) does not give priority to the specialist as it is in basic principles of the GTT but is the result of the combined work of terminologist, the specialist, the cognitivians and the internaute.

If hypertext still establishes relationships between nodes it is not on a hierarchical scale or on a classification vocation ; it allows an inner access to the non structural knowledge of the nets. Within the compound hypertext, each term becomes a node of information constitutive of a bigger article that "transcends" it: "[...] paradigms are at the same time pertinent without regard to considerations of scale and formu-

lated without interest in matters of singular context"[27] as it is in the sequential narrative of one-time events (historical thinking). In the tree field a set of terms represents the state of terminology in a field and, so on, a certain paradigm, evidently unstable, of the representation of knowledge (Sager, 1990: 16, Otman, 1996: 127). Christian Galinski says: "A structured set of concepts constitutes the 'skeleton' of any given scientific theory."[28] It doesn't automatically mean that a theoretic (conceptual) shift in science implies just a linguistic turn but that a scientific sees his thought transformed through theoretical evolutions. The term paradigm in this aspect is taken as a concrete scientific and terminological system achievement (See Ahmad 1996: 8) in a certain period of time, that's what makes it complex and unstable[29]. Maurizio Gotti says: nostra convizione infatti que esistano dei nessi indiscibili tra l'apparato epistemologico di una certa disciplina e la realizzazzione del suo linguaggio".[30] We would rather take it in a ethical and meta-physical perspective stating that navigating through terms within a net and creating links are basically making ethical and conceptual decisions concerning the type of conceptual information requested on the term. Jacob Neusner (1997: 359) says: "A paradigm predetermines and selects happening in accord with a pattern possessed of its own logic and meaning, unresponsive to the illogic of happenings, wheter chaotic or ordely, from the human perspective. A model is just that, there to dictate, organize, take over, make selections, recognize connections, draw conclusions." There are as many paradigms as there are ways to understand terms (strategies of thinking) and abstract the phenomenal world proving at the same time that terminology is constitutive of a phenomenal world and not of the reality, this last being inaccessible "epistemicly" (See Borella, 1989: 100).

The General Theory of Terminology has also based its hypothesis on hierarchical criterias, in other words on a sign problematics coming from the logic tradition. The actual development of technologies, the new possibilities which offer hypertext in the process of knowledge involve reconsidering those hypothesis and passing toward a textual problematic according to Rastier's terminology (1996: 12). In this aspect, various disciplines related with terminology represent a shift of viewpoint as shown by Engel and Picht (1990: 52) with the traditional data banks and documentation banks. The new way of retrieving and keeping terminological information consists of a new orientation in the processus of knowledge structuration.[31]

13 Conclusion

Within the computer mediated communication, the "internaute" can establish almost all the logical and ontological types of relations of terminology: meronymic relation (part-whole) (as exemple-collection made of) etc. but without any distinction of importance regarding hierarchical divisions. This point of view brings us to the question of the limits of term semantism in knowledge organization referring to the ideal dictionary of Abramson: "A dictionary should be an encyclopedic database of the words of a language or languages coupled with an open-ended set of deductive access methods and multimedia display methods." (1996: 12) In this sense, the texts in which terms appear, even if they are still considered as linear and sequential, are viewed as part of open text or a work (see the concept of opera aperta of Umberto Eco) more than just simple non linear texts linked to each others as in dictionaries. Terms would then benefit from ever new contexts. This is not a goal of resolving the problem of defining the terminological units. The terms are only shown in context, as is done in some terminological dictionaries. We still see the problem of discourse levels, as we have said referring to lexical and expert knowledge. It is a fact that terms are not always used in technical or scientific text ; depending on their place in a conceptual system, it can become relatively frequent for reason of actuality (Morgenroth, 1994: 72) borrowing then characteristics of the word. Why then are we still talking about terminotic if terminological units do not exist in the absolute. This would be the topic of another article. Nevertheless we can affirm that words of the general language do not appear in a technical sense whereas terms do. That's the multidisciplinary overview on lexical uses that open the discussion on the existence or non existence of terminological units. This is the reason why we didn't try to propose any distinction between linguistic semantics and encyclopedic knowledge.

Hyperterminotic access and terminology acquisition through the web are seen as processes of endoculturation (or acculturation) which implies a set of ethical decisions made by the designer and the "internaute". Further studies on the topic would help us to understand if domain trees are necessary to understand terminological data[32] . If we agree with this affirmation, we would then have to verify if they can be a starting point to the holistic understanding granted by representations-interpretations such as telematic ones. If metaterminology has been

developed within logical arguments, it's now being influenced by new semantical considerations, which involve the problem of diversity of discourse and borrowing from other subject fields. The meaning of paradigm in the sense of Kuhn seems no longer efficient with the interpenetration of sciences and media which contribute says Levy " à enfler la sphère des signes sans attaches [territoriales]."[33] Many phenomenae have to be understood in an interdisciplinary approach and, moreover, terms do not always belong to a solely field. As remarks Budin, the fields of human sciences and humanities, unlike natural sciences such as physics, etc., "do not have any predominant paradigm (in the sense of T. S. Kuhn) but rather a plurality of theories, hypotheses, schools of thought etc. concerning the sames "objects" This means that several differing concepts are formed about the same object according to the framework of the respective theory".[34]

In this paper I have tried to trace a link between the pure knowledge, objectivity, the "representation" and an ontological view of terms no longer represented, but rather, interpretated and newly organized. This research would surely benify of the theoretical trends of systemics, of neurology, highlighting the link between the approaches of the reticularists and neuronists of the organization of nervous cells and the reasons that leads us to think hypertextually.

NOTES

[1] Juan C. Sager, 1990: 4.

[2] See *International Conference on Computational Linguistics (6: 1977) Coling* Ottawa, Canada

[3] 1997: 128.

[4] See also his previous work in collaboration with P. J. Hayes: 1969

[5] See A. Assal, 1995.

[6] Judith Schlanger, 1995: 581.

[7] K. Opitz, 1??? : 53.

[8] Jean-Jacques Wunenburger says : "La raison humaine parvient [...] à canaliser le multiple par des systèmes classificatoires, par des langages et des codes, à stabiliser le mouvant par une logique identitaire qui amarre le flux et reflux des choses à des principes simples et des substances en nombre limité." (Jeaan-Jacques Wunenburger, 1990: 10). See also in the same work p. 138: "La relativisation de la pensée

identitaire passe en ce sens par une pluralisation des procédures de représentation et d"énonciation, reposant sur un éclatement du modèle logico-grammatical qui la gouverne."

[9] Rita Temmerman, 1997: 49.

[10] See also Otman 1996: 161-162 for multidimensional links and non hierarchical relationships.

[11] See Michel Lenoble, 1993.

[12] See F. Nietzsche: 1974 : 80.

[13] See P. Zumthor, 1993: p. 324.

[14] See Jean-Marc Chatelain, 1996: 159. Nedobity (1983: 7) also refers to the circles of Euler where the most general concept is situated in the centre and is included in all more specific concepts.

[15] Thomas D. Walker, 1996: 199.

[16] Bilingual dictionaries tend even to reduce the defining vocabulary to the minimum so the reader can understand them without difficulty. About the closiness of the dictionary, seee William Frawley, 1985: 10.

[17] Marie-France Mortureux gives the example of respiration in physic wich is defined as oxydation and in biology as gaz exchange (*échange gazeux*) (1995: 21).

[18] About interdisciplinary approach on culture, see Pilz , 1997: 423.

[19] See Otman, 1996: 161-162.

[20] Eve Sweetser, 1990: 12. See also p. 21.

[21] See François Gaudin, 1993b: 143.

[22] Jim Rosenberg, 1996: p. 115.

[23] C.Galinski and W. Nedobity, 1988: 59.

[24] 1995: 32.

[25] See Neusner, 1997: 354.

[26] Norma Bouchard, 1995 : 502.

[27] Neusner 1997: 371. See also Otman 1996 92 talking about the concept of *mythical time* in J. De Kleer et J. S. Brown (1984).

[28] C. Galinski, 1990: 89.

[29] Freud was already saying that the fondamentals concepts of physics were constantly modified (See Freud, 1968 : 12). Jean-Pierre Casseyre (1994: 172) gives us an example of this problem in the history of library classification: "Les notions utilisées dans certaines des classes de la CDU ont été rapidement dépassées par l'évolution des idées scientifiques, et la classification n'a été capable d'intégrer les notions nouvelles (en physique par exemple) que de manière purement artificielle".

[30] Maurizio Gotti, 1991: XI.

[31] See Pastor Sanchez and Perez, 1996: [51] and Condamines, 1994: 37-38.

[32] Otman writes: "Il est admis qu'un terme scientifique ne peut fonctionner qu'à l'intérieur d'un système notionel et qu'il tire son sens des liens [...] qu'il entretient avec l'ensemble des éléments de ce système." (1996: 126). L'organisation hiérarchique et la recehrche terminolgoque demanderait t-elle, au contraire de l'oganisation reticulaire, une connaissance élémentaire dans le domaine (See also R. Dubuc, 1992 :p. 38).
[33] Pierre Lévy, 1995: 202. See also K. Rajagopalan, 1996 and Erika Pisaneschi & Rosana Landi, 1998. Rajagopalan presuposes that diverse local truths concerning the same object are complementory.
[34] Budin, 1991: p. 338.

BIBLIOGRAPHY

ABRAMSON, Harvey. 1995 What is a Hyperdictionary. *TermNet News* 49, 7-13.

AHMAD, Kurshid. 1996 A Terminology Dynamic and the Growth of Knowledge: A Case Study in the Nuclear Physics and in the Philosophy of Science. In *TKE '96*, 1-11.

AMER, Anwar. 1984 The Effect of Knowledge-Map and Underlining training on the reading Comprehension of Scientific Texts. *English for specific purposes* 13-1, 35-45.

ASSAL, A 1995 La métaphorisation terminologique. *l'Actualité terminologique*, t. 28, n° 2, 22-24.

AUGER, Pierre. 1989 La terminotique et les industries de la langue. *Meta* XXXIV-3, [450]-456.

BAYM, Nancy K. 1995 From practice to culture on Usenet *The cultures of computing*, ed. By Susan Leigh Star. Oxford. Balackwell Publishersane The Sociological Review. 1995, [29]-52.

BERGENHOLT, Henning. 1995 Dictionary structures. In Sven Tarp (ed.) with contributions by Grete Duvå, Anna-Lise Laursen, Sandra

Nielsen, Ole Norling-Christensen, Jette Pederson, *Manual of specialized lexicography, the preparation of specialized dictionaries*, [188]-

223. Amsterdam/Phidadelphie. John Benjamins publishing company. (coll. Benjamins translation library, vol. 12).

BERK, Emily and Joseph Devlin (eds). 1991 *Hypertext/Hypermedia Handbook*. New York and al. McGraw-Hil Publishing Company.

BORELLA, Jean. 1989 *le Mystère du signe Histoire et théorie du symbole*. Paris. Editions de Maisonneuve et Larose. (coll. "Méta-langage").

BOUCHARD, Norma. 1995 Crifictional, epistemes in Contemporary literature : The Case of *Foucault's pendulum*. *Comparative Literature*, Maine, 32-4, 495-517.

BRETON, Philippe. 1992 *Utopie de la communication : l'émergence de l'homme sans intérieur*. Paris. Editions de la Découverte.

BUDIN, Gerhard, Helmut Lukas and Johann Stockinger 1994. Ethno-logical Knowledge and Hypermedia : New Ways of Representing Terminologies, Concept and Rituals. *Terminology, Science and Research; IITF-Journal*, 5-2, 1-21.

BUDIN, Gerhard, "The application of terminology-based knowledge data bases in the humanities and the social sciences and its impact on research methods", dans *Conputer in the humanities and the social sciences achievements of the 1980s , Prospects for the 1990s; Proceedings of the Cologne Computer Conference 1988, Uses of the Computer in the Humanities and Social Sciences held at the University of Cologne, September 1988* (ed. par Heinrich Best, Ekkehard Mochmann et Manfred Thaller), München et al., K. G. Saur, 1991, [337]-342.

CABRE, Maria Teresa. 1993 *La terminología, Teoría, metodología, aplicaciones*, prólogo de J.-C. Sager. Barcelona. Editorial Antartida/ Empúries. [original edition in Catalan] recently translated into English (edit. Juan C. Sager; transl. Janet Ann De Cesaris, Amsterdam, John Benjamins, 1999.

CABRE, Maria Teresa. 1996 Terminology today. In Harold Somers

(ed), preface of Harold Somers and Blaise Nkwentiazeh *Terminology, LSP and translation; studies in language engineering in honour of*

Juan C. Sager, [15]-33. Amsterdam/Phidadelphia, John Benjamins Publishing Company, 1996.

CANDEL, Danielle, Hiltrud Gerner, Annie Bernardoff, Pascal Baudinot. 1990 Aspect de la documentation scientifique et technique dans un grand dictionnaire de langue. In Danielle Candel (eds), *Dictionnairique et lexicographie, Autour d'un dictionnaire: le "Trésor de la langue française" témoignages d'atelier et voies nouvelles*. 29-52. Paris. Didier Érudition.

CANDEL, Danielle. 1993 Français oral de spécialité et terminologie. *Le Langage et l'homme*, XXVIII-4, special issue «Socioterminologie», 259-272.

CARR, Michael, 1997 Internet Dictionaries and Lexicography. *International Journal of Lexicography*, [209]-230.

CASSEYRE, Jean-Pierre. 1994 Classements, classification et mode d'accès. In Daniel Renoult (Ed.) *les Bibliothèques dans l'Université*. Paris: Éditions du Cercle de la Librairie, p. [167]-176.

CHATELAIN, Jean-Marc. 1996 Du Parnasse à l'Amérique: l'imaginaire de l'encyclopédie à la renaissance et à l'Age classique. In SCHAER (eds.), 156-163.

CONDAMINES, Anne 1994 Terminologie et représentation des connaissances. *La Banque des mots*, special issue 6, 29-44.

COOK, Guy. 1994 chapter 3 A second bearing: AI theory and its limitations., *in Discourse and Literature: The Interplay of Form and Mind*, [59]-94. Oxford, Oxford University Press.

[*TKE '90*] CZAP, Hans, and Wolfgang Nedobity (eds). 1990 *TKE '90 : Terminology and knowledge engineering*, Frankfurt. Indeks Verlag. 2 vol.

[DEWEY, Mevil]. 1990 *Abrégé de la classification décimale de Dewey; nouvelle édition augmentée à partir de la première version*

intégrale française et de la XIX^e édition intégrale en langue anglaise, par Anne Béthery. Paris. Editions du Cercle de la Librairie. (coll. "Bibliothèques").

DE SCHAETZEN, Caroline. 1997 Chassé-croisé de vocables entre l'informatique et les disciplines automatisées. *Terminologie et inter-disciplinarité* (ed. by C. DE SCAHETZEN), Peeters, Louvain-la-Neuve, 1997, p. 123-135.

DIAZ, Consuelo Martin. 1982 *Conocimiento y realidad en la mandukya upanishad y gaudapada*. Unpublished doctoral dissertation, Universidad de Madrid, dep. de metafisica.

DUBUC, Robert 1992 *Manuel pratique de terminologie*. Montréal: Linguatech; Paris: Conseil International de la langue française, 102 p.[original edition 1978].

DRASKAU, Jennifer Kewley, Herbert Picht (eds). 1994 *International Conference on Terminology science and terminology planning, Riga, 17-19 August, International IITF-Workshop, Theoretical issues of terminology science, Riga 19-21 August 1992*.Vienna. International Network for Terminology.. (IITF series ; 4).

ESTEBAN, Miguel A., 1996 Los lenguajes documentales ante el paso de la organización de la realidad y el saber de la organización de conocimiento. *Scrire, representación y Organización del Conocimiento*, 1-2, [43]-71.

FELBER, Helmut. 1994 East-West Cooperation in International Terminology Work in the 1930s : Drezen and Wüster In DRASKAU and PICHT (eds).40-48.

FRAWLEY, William, 1985 Intertextuality and the Dictionary : toward a deconstructionist account of lexicography. *Dictionaries, journal of the Dictionary society of North America* 7, 1-20.

FREUD, Sigmund. 1968 *Métapsychologie*. Paris. Gallimard.

[*TKE '96*] GALINSKI, Christian, Klaus-Dirk Schmitz, (edited by*)* 1996 *TKE '96, Terminology and Knowledge Engineering*, preface of K.-Dirk

Schmitz, Frankfurt/Main, Indeks Verlag.

GALINSKI, Christian, W. Nedobity. 1988 Une banque de données terminologiques considérée comme outil de gestion. *La Banque des mots*, special issue, p. 55-67.

GALINSKI, C., 1990, Recent developments of terminology. In Cabre M. T., L. L. Payrató, L. Sopeña (eds), *la lingüistica aplicada. Noves Perspectives/Noves Professions/Noves Orientacions*, Barcelona, Universitat de Barcelona, p. 87-91.

GAUDIN, François. 1993 Socioterminologie : propos et propositions épistémologiques. *Le Langage et l'homme* XXVIII-4, Special issue "Socioterminologie", 247-258.

GAUDIN, François. 1993b *Pour une socioterminologie: des problèmes pratiques sémantiques aux pratiques institutionnelles*. Rouen: Publication de l'Université de Rouen, n° 182, 254 p.

GENTILHOMME, Yves 1994 L'éclatement du signifié dans les discours scientifiques. *Cahier de lexicologie* 64, 1994-1, 5-35.

GIFFARD, Alain.1997 Petite introduction à l'hypertexte. In Nathalie Ferrard (ed.), *Banques de données et hypertextes pour l'étude du roman*, [99]-117. Paris. Presses Universitaires de France.

GOTTI, Maurizio. 1991. *I linguagi specialitici, caratteristiche linguistiche e criteri pragmatici*? Scandicci (Florence), Nuova, Itialia Editrice.

GOUADEC, Daniel. 1992 Première séance plénière : Terminologie et terminographie le point de la situation. In Daniel Gouader (ed), *Terminologie et terminotique, Actes de la première université d'automne en terminologie, Rennes 2, 21-26 septembre 1992*, 47-54. Paris, Maison du Dictionnaire.

GUESPIN, Louis 1990 Socioterminology facing problems in standardization. In *TKE '90*, 642-648.

HANDKE, Jürgen. 1995 Mental and machine-readable lexicons: What can machines learn from the world. In Ren, Dirven, Johan Vanparys (eds), *Current Approaches to the lexicon; A Selection of Papers presented at the 18th LAUDSYmposium*, *Duisburg, March 1993*, [273]-299. Frankfurt am Main. Peter Lang. (coll. Duisburg Papers on Research in Language, band 24).

HANDWERKER, Brigitte 1989 Savoir lexical, savoir expert: problème de représentation. *DRLAV; Revue de linguistique* 40, "Signes et sens", p. [63]-87.

LENOBLE, Michel 1993. Une génération perdue. *Texte, revue de critique de de théorie littéraire*, "Texte et informatique", n° 13/14, University of Toronto, p. [47]-58.

LERAT, Pierre, 1997 Le Contenu terminologique au péril de l'interdisciplinarité. Le cas de *connaissances*. *Terminologie et interdisciplinarité* (édité par C. de Schaetzen), Louvain-la-Neuve, Peeters, 5-13.

LEVY, Pierre. 1995 *l'Intelligence collective, Pour une anthropologie du cyberspace*. Paris. Editions La Découverte. (coll. "Sciences et société").

LOFFLER-Laurian, Anne-Marie 1994 Réflexions sur la métaphore dans les discours scientifiques de vulgarisation. *Langue française*, 1994-1, 72-79.

MAIGNIEN, Yannick. 1995 La Bibliothèque Virtuelle ou de l'Ars memoria Xanadu. *Bulletin des bibliothèques de France* 40-2, 8-17.

MAYER, R., D. Geer and K.-H. Hanne 1990 How to bring hypertext to termbanks. In *TKE, 1990*. vol. 2., 437-446.

McCARTHY, John. 1985 Epistemological Problems of Artificial Intelligence. In Ronard J. Brachman, Hector J. Levesque (eds), *Readings in Knowledge representation*, 23-30. San Mateo (Calif.). Morgan Kaufman publishers.

McCARTHY, J. and P.J. Hayes 1969 Some philosophical problems from the standpoint of artificial intelligence. In Michie, D.; Meltzer, B.

(ed.), *Machine Intelligence*, 4. Edinburgh. Edinburgh University Presss, 463-502.

McGOVEN, Sean [1998] "Web sites: Multiple ideologies in new representational forms", 6th International Pragmatics Conference, 19-24 July 1998, Reims, France.

MESCHONNIC, Henri. 1996 L'encyclopédie sortant de son mot pour se voir. In SCHAER, Roland (ed.), 19-25.

MERTEN, Pascaline. 1992 Apport des relations notionnelles à la description terminologique. Paper presented to the TAMA '92, Avignon, 1992.

MERTEN, Pascaline, Jean Mertens et Marc Van Campenhoudt. 1992 Microglossaire, réseau notionnel et gestion informatique; une expérience de recherche en Communauté française de Belgique. In Daniel Gouadec (ed), *Terminologie & Terminotique; outils, modèles et méthodes; Actes de la Première Université d'Automne en terminologie, Rennes 2-21 au 26 Septembre 1992*, 277-293 . Paris. La Maison du Dictionnaire, 1992.

MORGENROTH, Klaus 1994 *le Terme technique, Approches théoriques, études statistiques appliquées à la langue de spécialité économique du français et de l'allemand*. Tübingen, Max Niemeyer Verlag, (coll. Beihefte zur zeitschrift für romanische Philologie, Band 250).

MORTUREUX, Marie-Françoise. 1995 Le vocabulaire scientifique et techinique In Jean-Claude Beacco and Sophie Moirand, (eds), *les Enjeux des discours spécialisés, Les Carnets de Cediscor* [Centre de recherche sur les discours ordinaires et spécialisés], 13-26. Paris. Presse de la Nouvelle Sorbonne.

NEDOBITY, Wolfgang, "Conceptology and semantics; a comparison of their methods and an examination of their applicability in terminology", *Infoterm*, 1-1983, 16 p.

NEUSNER, Jacob. 1997 Paradigmatic versus historical thinking: the case of Rabbinic Judaism. *History and theory, studies in the philosophy of history*, 36-3, [353]-377.

NIETZSCHE, F. *Ecce homo Comment on devient ce que l'on est*. 1974 Paris: Gallimard. [original edition: 1908].

OESER, E. 1994 Terminology and Philosophy of Science. In DRASKAU and PICHT, 24-34.

OPITZ, K., **????** On dictionaries for special registers, the segmental dictionary. *In Lexicography: Principles and practice*, In R. R. K. Hartmann (Ed.), London and others, Academic press,

OTMAN, Gabriel. 1994 Pourquoi parler de connaisssance terminologiques et de bases de connaissances terminologiques. *La Banque des mots*, Special issue 6, 5-27.

OTMAN, Gabriel. 1996 *les Représentations sémantiques en terminologie*. Paris, Barcelone, Milan. Masson.

PASTOR SANCHEZ, Juan Antonio and Tom Saorin Perez, 1996 Un interfaz hipertexto para un sistema de gestión de Tesaurus. *Scrire, Representación y Organización del conocimiento*, 2-1, [51]-62.

PIOTROWSKI, David. 1996 Opérateurs hypertextuelles et formes lexicographiques. In David Piotrowski (ed.), *Lexicographie et informatique; autour de l'informatisation du Trésor de la langue française, Actes du colloque International de Nancy (29-30-31 mai 1996*), 319-336. Paris. Didier Erudition.

PISANESCHI, Erika & Rosana Landi (to be published), Interdisciplinarity: is ti a feasible enterprise. 6th International Pragmatics Conference, Reims, July 1998.

PITZ, Kersten. 1997 Complexity: a paradigm for "one culture?". *Forum Italicum*, 31-2, 423-437.

RAJAGOPALAN, Raja, 1996, A interdisciplinaridade: um imperativo desde sempre. *Boletim da Associação Brasileira de Lingüistica*. N° 19. Maceió, Brazil: Impresa Universitáira, UFAL, 93-103.

RASTIER, François. 1995 Le terme: entre ontologie et linguistique. *La Banque des mots*, Special issue 7, [35]-65.

RASTIER, François. 1996 Problématiques du signe et du texte. *Intellecta*, 2, [11]-52.

ROBERTSON, Roland.1996 Globality and Transdisciplinarity [review Article of Cultural identity and Global Process, Jonathan Friedman, London, Sage publications, 1994]. *Theory, Culture and Society*, "Exploration in Critical social Science", 13-4, [127]-132.

ROSENBERG, Jim 1996 The interactive Diagram Sentence: Hypertext as a medium of thought. *Visible language New media poetry : Poetic Innovation and New technologies*, n° 30.2, Rhode Island, p. 102-117.

ROJO, Arcadio, «Hypermedia Decision Net Un nuevo Paradigma Docente Profesional-Telematico», Barcelona, [Universitat de Barcelona], [n.d.], 21 f.

ROJO, Arcadio, 1992 Carnegie Mellon University: Culturas de invención ingeniería informática; culturas de invención social, Unpublished doctoral dissertation, Universitdad de Barcelona.

ROJO, Arcadio, 1995 La invención de máquinas simuladoras de los procesos heurísticos del pensamiento. *Anthropos, revista de documentación científica de la cultura*, 164, [33]-40.

ROJO, Arcadio and Teresa Cabre, 1996 Specialized knowledge representation: towards a new hypertextual/multimedia proposal. In *TKE '96*, [414]-423.

SAGER, Juan C., 1990 *A practical course in terminology processing*, with a bibliography by Blaise Nkwenti-Azeh. Amsterdam/ Philadelphia. John Benjamins Publishing Company.

SCHAER, Roland (ed.). 1996 *Tous les savoirs du monde, Encyclopédies et bibliothèques, de Sumer au XXIe siècle*. Paris. Bibliothèque nationale de France, Flammarion.

SCHLANGER, Judith, 1995 Connaissance et métaphore. *Revue de synthèse* n° 4, t. 116, oct.-dec. 1995, p. [579]-592.

SIMMEL, Georg. 1995 Le problème du temps historique, pres. Et

transl. of Jean-Luc Evard. *Revue de métaphysique et de morale*, 100-3, 295-309.

SLODZIAN, M. 1994 Terminology Theory and Philosophy of Science. In DRASKAU and PICHT, 35-39.

SLODZIAN, M. 1995 Comment revisiter la doctrine terminologique aujourd'hui. *la Banque des mots*, Special issue 7, [11]-18.

SWEETSER, Eve E. 1990 *From etymology to pragmatics*. Cambridge: Cambridge University Press, 174 p.

TIMMERMAN, "The process of (neo-) lexicalization: the case of the life sciences", *Terminologie et interdisciplinarité*, (ed. by C. de Schaetzen), Peeters, Louvain-la-Neuve, 1997, p. 47-62.

TODT, Oliva. 1997 Ingeniería y controversia social: hacia una nueva forma de diseño de sistemas técnicos. *Arbor,*. CLVII (julio 1997), 167-182.

WALKER, Thomas D. 1993 Medieval Faceted Knowledge Classification: Ramon Llull's Trees of Science. *Kowledge Organisation*, 23, n° 4, 199-205.

[WÜSTER, Eugen]. 1996 *Terminologia, selecciò de textos d'E. Wüster*, (M. Teresa Cabre I Castellvi ed).Barcelona. Servei de llengua catalana

WUNENBURGER, Jean-Jacques. 1990 *la Raison contradictoire, science et philosophie modernes: la pensée du complexe*. Paris. Albin Michel.

ZUMTHOR, Paul 1993 *la Mesure du monde*, *représentation de l'espace au Moyen-Âge*. Paris: Editions du Seuil, 438 p.

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