Chapter III

FROM THE CONCEPT TO THE SIGNIFIED

Thought doesn't express itself in
the word, it accomplishes
itself there.

L.S. Vygotsky

1. The problematic*

The conception of linguistic semantics that we are now going to outline will orient the remainder of this work in a very direct way. Rather than develop our own theories it seems to us preferable to adopt first of all a historical perspective and present an overview of the major conceptions of meaning that traverse the history of ideas and that confront one another today in the domain of cognitive research.

A preliminary remark foretells what is at stake in this chapter: Artificial Intelligence and cognitive psychology generally use the word *concept*[1] in order to designate the content of a lexeme. This usage conforms to the traditions of logic and of the philosophy of language. Above and beyond the terminological disputes, the absence of a distinction between *signified* and *concept* conceals a crucial problem: is it necessary or not to distinguish the semantic level of natural languages from the conceptual level?

Semantics is the most recent of the branches of linguistics and it is still in the process of being constituted. And whereas there have been syntaxes galore over the last two thousand years, the project of a linguistic semantics barely goes back to the end of the last century. The reason is that before this logic and the philosophy of mind[2] had always focused on the linguistic signified, since natural languages were considered as simple vehicles of meaning. These disciplines have still not relinguished the idea.

Saussure's stroke of genius was to have repatriated the signified within natural languages by distinguishing it from the logical or psychological[3] concept; it is this very move that laid the foundation for a properly linguistic semantics. Of

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* In this chapter, I profited a great deal from the observations of Françoise Desbordes.

1 In cognitive research, the word *concept* has at least five meanings. (cf. *infra*, chap. IV).

2 Destutt de Tracy's *Idéologie*, which is contemporaneous with the formation of comparative linguistics, remains here altogether exemplary, even by its pretentions to scientificity.

3 Saussure for example remarks: "Considered independently, concepts like "house", "white", "see", etc. belong to psychology. They become linguistic entities only when associated with sound-images" (*Course in General Linguistics*, trans. Wade Baskin, McGraw-Hill, 1959, p. 103).

course the distinction between signified and signifier will nevertheless find itself omitted in a hundred different ways, in order to reduce semantics either to a logic or to a psychology. The reduction of the signified to the logical concept remains the basis of truth-conditional semantics. The reduction of the signified to the psychological concept is the basis of "psychological" or cognitive semantics. The *petitio principii* on which Jackendoff bases himself in *Semantics and Cognition* bears witness to this: "there is a *single* level of mental representation, *conceptual structure*, at which linguistic, sensory, and motor information are compatible" (1983, p. 17). Hence the simplistic conclusion: "studying the semantics of natural language, is to study cognitive psychology". But what is gained by reducing semantics to psychology, as was already being done at the beginning of the century ? We foreclude a necessary and profitable cooperation by amalgamating these two disciplines, even partially, without first preoccupying ourselves with the specific character of their respective objects and objectives.

We might certainly consider as secondary the question of whether or not there exists an autonomous linguistic semantics. The crucial question remains the existence and nature of the conceptual level. However if we agree on recognizing its existence, we have to recognize as well that this level is specific neither to particular languages nor to languages in general, nor even to other systems of signs.

2. THE MODELS OF SIGNIFICATION

The semantic conceptions that are dominant in Artificial Intelligence and within cognitive research more generally become clearer if we consider the models of signification that subtend them.

First, a terminological precision is in order: by *signification* we mean the content of a linguistic sign (whatever the level it may be situated at) considered independently of context; by *meaning*, this content considered within context[4]. We dismiss the undifferentiated use of the word "meaning" commonplace in cognitive research where it may designate the lived experience of the individual (in a popularized phenomenological sense) no less than his intentionality (cf. the inifinitive *to mean* and the enthousiastic use the pragmaticians[5] made of it), or even the meaning of a non-linguistic sign. We shall limit ourselves here to the linguistic signified (meaning and signification).

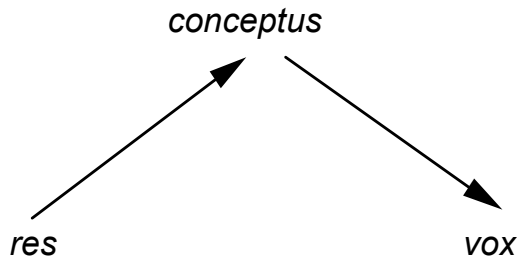
2. 1. *The triad*

[4] We are following the usage that goes back to Dumarsais and Beauzée (see the entry for "meaning" in the *Encyclopédie*, 1769, XV, 16). The relation of signification to meaning is the relation between type and token. Signification is an artefact of linguists, and in particular, of lexicographers (cf. *infra*, chap. IV).

[5] Cf. e.g. Sperber and Wilson, 1989, or Searle, 1983, stating that linguistic meaning is a form of derived intentionality.

The philosophy of language has been based on a triadic model since Aristotle (and particularly the beginning of the *Peri hermeneias)*; cf. I, 16 a, 3-8): " Spoken words are the symbols of mental experience and written words are the symbols of spoken words. Just as all men have not the same writing, so all men have not the same speech sounds, but the mental experiences, which these directly symbolize, are the same for all, as also are those things of which our experiences are the images". Aristotle very clearly opposes the variety of written and vocal signs to the universality of states of feeling and of affairs: herein lies the foundation of the traditional universalism in semantics.

After Boethius, Saint Thomas of Aquinas reformulated the triad in this way: " Since according to the Philosopher (*Peri Herm. i*), words are signs of ideas, and ideas the similitude of things, it is evident that words relate to the meaning of things signified through the medium of the intellectual conception**.**" (*Summa Theologica*, I-ap, 2-13, al, resp.). Thus the following representation:



The scholastic triad, from the general grammars to Ogden and Richards (1921) and Lyons (1978), has been perpetuated right up until the present day (for a historical overview and discussion, see Rastier, 1990 a).

In the linguistic tradition stemming from Saussure on the other hand, this triad has been challenged for three quarters of a century; in the philosophy of language it has dominated almost without challenge. Since the principle linguistic ideas in cognitive research derive from this tradition, the Aristotelian triad serves as the conceptual framework for research programs. Thus for example Philip Johnson-Laird who defines the general objective of research in this way: "Logicians have related language to models only in certain ways, psychologists have only related it to itself. The real task, however, is to show how language relates to the world through the agency of the mind [6]" (1988, p. 57).

Of course Saint Thomas of Aquinas evoked speech (*voces)* and not language *per se* ; but, for the orthodox cognitivists, language is an ensemble of expressions, that is to say, the linguistic sign is a signifier (whether written or oral is of little importance here) related to a concept. And where Aquinas spoke of

6 Johnson-Laird criticizes contemporary logicians for having obscured the problem of reference though in fact what they did was to make it more sophisticated by extending it to within a theory of possible worlds. As for the psychologists, Johnson-Laird criticizes the associationist current that developed semantic networks following Quillian (cf. *infra*, chap. IV).

concepts[7] (*conceptus)*, Johnson-Laird speaks of *mind*, though for him the mind is the locus of (algorithmic) operations on concepts (cf. *op. cit* ., p. 57).

Within the field of cognitive research, Putnam was the only one, or almost the only one[8], who dared to contest the Aristotelian triad and he did so in a courageously autocritical work, almost a palinode. Here's how: "Aristotle was the first thinker to theorize in a systematic way about meaning and reference. In *De interpretatione,* he laid out a scheme which has proved remarkly robust. According to this scheme, when we understand a word or any other "sign", we associate that word with a "concept". This concept determines what the word refers to. Two millenia later, one can find the same theory in John Stuart Mill's *Logic*, and in the last century one finds variants of this picture in the writings of Bertrand Russell, Gottlob Frege, Rudolf Carnap, and many other important philosophers" (1988, p. 19). This passage is rife with inexactitudes[9]; regardless, what is important here is that Putnam manages to reject as false the following three theses:

«1. Every word he uses is associated in the mind of the speaker with a certain mental representation.

2. Two words are synonomous (have the same meaning) just in case they are associated with the *same* mental representation by the speakers who use the words.

3. The mental representation determines what the word refers to, if anything.» (*ibid.*)

By *mental representation* Putnam means the "concept"[10], and in fact his criticism of mentalism is not directed at representations as such but puts their universality in doubt as well as their relation to the referent. In short, two identical words in two languages or dialects can have two distinct referents (*he* in Hebrew and in English, *bonnet* in British English and in American English)[11]. Moreover, two speakers who ignore the difference in their respective dialects can associate to a given word the same mental representation even though in each of the dialects the

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7 We cannot detail here how "states of feeling" (*pathémata)* in Aristotle were Platonized by Boethius who makes thoughts of them (*intellectus)*, nor how Aquinas insists on seeing them as concepts (in a logical and not psychological sense of course).

8 Paradis (1985, p. 1) for example distinguishes "lexical meanings (which are language-dependent)" from " empirical and conceptual mental representations (which are independent of languages)", and he holds, implicitly, the triadic model of signification to be unsatisfactory.

9 In the passage cited, Aristotle is treating words exclusively and not other signs. The "states of feeling" (*pathémata)* are not equivalent to concepts and it will take a good thousand years before the equivalence is established. Finally, Carnap, at the same time as Morris, contributed to the dismemberment of the triad with the theory of *direct* reference, which links expressions to their *designata* without mediation.

10 He specifies: "instead of the word "concept" I shall use the currently popular term "mental representation", because the idea that concepts are just that--*representations in the mind*--is itself an essential part of the picture (*ibid*., p. 19).

11 These examples show that Putnam is here reducing the word to the signifier.

reference is different. In the final analysis, "reference is a social phenomenon[12]" (1988, p. 22).

By taking these positions, Putnam aims to contest the cognitivist postulate attributable to Fodor, namely that there exists a language of universal thought independent of natural languages, the *mentalese* (cf. Fodor, 1975). It is innate, of course. Understanding a text consists of translating its utterances into this mental language (then, if the need is felt, to turn to postulates of signification in order to infer new propositions)[13]. Two words belonging to different languages and which have the same meaning are "simply two different "codes" for the same item (the same "concept") in the *lingua mentis* " (Putnam, 1988, p. 21).

To this mental language Putnam opposes "surface mental representations" («subvocalized» thoughts). Conscious, they are "the only mental representations of whose existence we have any sure knowledge" (1988, p. 39). As well, they "badly violate principle 2"[14]; thus, "the Frenchman's surface mental representation of an elm is not literally the same as my surface mental representation of an elm. His mental representation, at the surface level, is *arbre qu'on appelle "orme"* ; my mental representation, at the surface level, is *tree that one calls an elm* " (*ibid* ., p. 39).

The dispute about the Aristotelian triad remains quite benign here. Putnam is simply underlining that the relation of the word to the concept on the one hand, and of the concept to the referent on the other, are not simple relations and are dependent on the speaker's knowledge and on social norms respectively. Putnam thus opposes to Fodor's universalist mentalism a relativist mentalism. Without dismembering the triad, he submits its functionning to complex conditions.

But he evidently does not go so far as to distinguish signifieds from representations. If his relativism relies, naturally, on the diversity of languages, he only argues on the basis of the diversity of expressions which differentiate surface mental representations. *Elm* and *orme* would not differ by reason of their signified but rather by the fact that the surface mental representations include an indication of their differences with regard to the signifier.

Putnam consequently remains within the tradition of the philosophy of language, as is made clear by his preconception of language as nomenclature, his fidelity to the Aristotelian triad, and even by his definition of the lexical signified as a typical *mental representation* (the *stereotype*[15]).

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12 We would say that reference is determined by norms (and not rules in the strict sense) belonging to the system just as much as to usage. If we restrict ourselves to the word, in written languages like English or French, at least two thirds of them are monosemic. The meaning of the other third remains fixed by particular discourses (e.g. legal, political etc.) as well as by the textual genre in which the word is used. Each textual genre is proper to a given social practice and includes a (generally implicit) referenciation contract.

13 This is Kintsch's thesis, when he applies Fodor's theory to textual analysis.

14 Specifically, the principal that has to do with synonymy. We will examine the importance of the problem of synonymy later in this chapter: it introduces into language a diversity that menaces the unity and autonomy of the conceptual level.

15 See Putnam in particular, 1975 b and 1988, p. 30. A lexical stereotype is an agglomeration of beliefs associated to a word.

Note: The theory of interior language goes back at least to Plato[16], and the Stoics clearly distinguished exterior language (*logos prophorikos*) from interior language (*logos endiathétos*). Two conceptions confront one another in history: either interior language varies with different languages or it is independent of them. The Platonic and neo-Platonic traditions, especially in Plotinus, illustrate the second option while the Stoics tended clearly towards the first. Saint Augustine, followed here again by Aquinas, managed to reconcile the two positions by splitting interior language into a verb of the heart ("which does not belong to any language") and an interior verb (which varies according to the various "ethnic"[17] languages).

Theories of interior language are far from scarce, from William of Ockham to Vigotsky. But for the orthodox cognitivists, Fodor first and foremost, an Augustinian-style synthesis was unthinkable: the variability of signifieds threatened to compromise the universality of concepts. Nonetheless, in contesting Fodor's thesis of the *lingua mentis* and of the universality of the concept, Putnam arrives quite naturally at the postulation of surface mental representations, these being language-relative as was the *interior verb* [18]. He thus rearticulates the Stoic solution whereas Fodor without knowing it inherits the Platonic perspective[19].

Whatever the case, Putnam is outlining a "negative theology" of signification, and each of his arguments stems directly from the problematic that he is attacking. We will see later on how a tranquil impiety might be achieved.

Putnam's objective is obviously not to emancipate himself from the philosophy of language. In order to introduce what would have been a new problematic, one would have had to distinguish linguistic meaning from mental representations, as did most notably Heger, Baldinger and Coseriu. Herein lies the constitutive gesture of a linguistic semantics. In the absence of such a gesture, linguistic meaning finds itself forever subjugated to logic (since the dialectic of the Stoics) or to psychology (since Steinthal). In commenting on the triadic model of signification as formulated by Lyons (*Form* / *Meaning* (*Concept*) / *Referent*), Petöfi explains that "the term 'concept' has a psychological and logical interpretation, that is to say, a concept is either a physical object or a logical object" (1974, p. 8). Cognitive theories of meaning have all confined themselves to this secular alternative, either by professing in various ways a logical universalism or a psychological mentalism and even to the point of trying to reconcile the two by appealing to the theory of *mental models* .

It is a revealing coincidence that at the same time as Putnam obscures the triadic model of signification, without proposing anything to replace it, he contests the central tenet of cognitivism, namely *functionalism* (cf. chap. 1): thought is

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16 The *Sophist*, 263 e: "What we have called thought is this internal dialogue of the soul with itself, which is produced without the intermediary of voice".

17 Cf. *De Trinitate*, X, 19. For a more detailed examination, see Rastier, 1990 a.

18 Even if, according to Putnam, these mental representations remain *concepts* (and not signifieds, cf. *supra*).

19 For Fodor, the language of thought is innate. According to Plotinus (*Enneads*, I, 2, 3, 27-30) the "language that is in the soul" is the spokesman for an anterior principle. By virtue of a scientistic involution of speculative thought, the biological replaces the theological. In other words, genesis--which for Plotinus is an emanation--passes the theological over to genetics (cf. *infra*, chap. IX).

independent of its material substratum, whether it be biological (the brain) or artificial (the computer)[20].

The simultaneous contestation of the triad and of functionalism invites one to suppose that these two theoretical constructions derive from a common philosophical foundation, idealism, that would assure the independence of form in relation to substance, and of the concept in relation to the signifier: the concept is in effect a form (*eidos)*, whereas the signifier has always been part and parcel with substance.

2.2. *The Index*

The Aristotelian triad is not the only ancient conception of signification that still finds itself at the center of debates among cognitivists.

In reformulating the rhetorical theory of the index, Aristotle defines the *sêméion* as follows: "The sign (*to sêméion)* is supposed to be either a necessary or an accepted demonstrative premise. For whatever is such that if it is, a certain thing is, or if it happened earlier or later the thing in question would have happened, that is a sign of this thing's happening or being" (*Prior Analytics*, II, B27; 10 a, 7)[21]. This definition summarizes an indexical paradigm that I cannot set out in detail here; it found its way into Augustine's theory of natural signs (*signa naturalia*, cf. in particular *De doctrina christiana*, II, 1, 2) and continued right up until the grammars of the Enlightenment (from Condillac to Destutt de Tracy) and even into Peirce's phaneroscopy.

Sextus Empiricus mentions the Stoics' distinction between indexical signs (e.g., there is no smoke without fire) and evidential signs (e.g., the body's movements are signs of the soul ; cf. *Hypotyposeis* II, 97-102). However this distinction does not prevent us from reuniting these constitutive relations of the index under the general concept of *inference*, which also includes implication.

However words and languages have nothing to do with the indexical paradigm, or at least they have no specific place within it. Hence a difficulty clearly formulated by Hugh of St. Victor: "The signification of things is far more diverse than the signification of words: few words possess more than two or three significations whereas any possible object, in order to signify others, can be as multiple as the visible or invisible properties that it contains and which it has in common with other things[22]" (*De scripturis et scriptoribus praenotatiunculae*, XV).

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20 Functionalism is beginning to be contested today. Searle (1990, p. 29) writes with assurance that "I can derive an important conclusion about human brains: The way that human brains actually produce mental phenomena cannot solely be by virtue of running a computer program". This *only* is only half-way reassuring.

21 The classic example is the hypothetical enthymeme "if she is lactating, she has given birth" (*Prior Analytics*, II, 18, 70 *a*, 11-16). Cf. Plato's *Menexenus* where the humorous proof is given that the Athenian soil gave birth to the Athenians because it provided the substance for them to feed themselves (237 *e* -238 *b*).

22 He is comparing here, implicitly, the conditions of the *allegoria in verbis* and the *allegoria in rebus* (cf. Bede the Venerable, *De schematibus et tropis*, and Rastier, 1987 a, chap. VIII). The

Within cognitive research, pragmatics has rearticulated the indexical paradigm (since it has taken over from rhetoric where this paradigm originates) and continued it in a variety of ways. Sperber and Wilson for example propose an inferential model of communication: "From Aristotle through to modern semiotics, all theories of communication were based on a single model, which we will call the *code model*. According to the code model, communication is achieved by encoding and decoding messages. Recently, several philosophers, notably Paul Grice and David Lewis, have proposed a quite different model, which we will call the *inferential model*. According to the inferential model, communication is achieved by producing and interpreting evidence[23]" (1986, p. 2).

The formulation of this alternative model raises a few questions. One can agree that Grice be presented as the creator of a new "model"; but he is really only the last one to have created it since the model finds its first known formulation in the *Prior Analytics* of Aristotle. And that pragmatics, following rhetoric, presents the problem of signification in terms of communication is an entirely normal thing. After all, *Péri hermemeias* signifies *On expression* rather than *On interpretation*. But to attribute to Aristotle a "code model" seems too generous, and risky, all the more so when this model is assimilated with Shannon and Weaver's[24]. Yet, information is a statistical property of the signal and this property hasn't anything in common with signification or with linguistic communication.

The objective (or at least the effect) of these confusions is clear: to efface the specificity of linguistic signs in relation to signals-- while denouncing the "intellectual failure" of semiotics, cf. *op. cit* ., p. 19--in order to annex the study of meaning to a philosophy of intentionality.

The reference to the Aristotelian triad permits one to understand (or at least to conjecture) that the code model is also a model of reference. In its opposition to the "inference model" we rediscover the classic distinction between semantics (as the theory of reference) and pragmatics (as the theory of inference[25]). We can

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theologies of the Book are in accordance with the traditional philosophy of language insofar as they impose a *realist* conception of signification.

23 Grice's universal fortune is due less to his irenic naivety (for it discourages contradiction) than to his *a priori* universalism (in the Kantian sense of the term). His *Principle of cooperation* is formulated in the following way: "That your contribution to conversation, when it occurs, be in conformity with the aim or general direction of the verbal exchange that you are engaged in" (1975, p. 45)**.** This ethnocentric norm is held as valid for the foundation of all communication. This norm is specified with maxims, according to the categories recognized by Kant for governing our judgments.

24 "While Shannon and Weaver's diagram is inspired by telecommunications technology, the basic idea is quite old, and was originally proposed as an account of verbal communication. To give just two examples: Aristotle claimed that 'spoken sounds are symbols of affections in the soul', which are themselves 'likenesses of actual things' (Aristotle, *De Interpretatione: 43)*. In our terms, he claimed that utterances encode assumptions (1986, p. 5). Their terms, which amount to a retranslation, are pure fantasy.

25 This distinction permeates the entire Western history of reflection on signification. In the tradition of speculative grammar, the first current is represented by the Modistae and the second is represented by the intentionalists (with authors like Kilwardby and Bacon). Rosier has summarized the opposition: "In short, one could say that on the one hand an Aristotelian perspective is dominant and by this we mean a perspective that privileges the conception of language as an instrument of

consequently better understand why Sperber and Wilson consider these two models as complementary (cf. 1986, p. 2): they complete one another within the framework of the semiotic tripartition "syntax/semantics/pragmatics" which in our view constitutes the principal epistemological obstacle confronting contemporary linguistics (cf. Rastier, 1990 a).

3. TWO FUNDAMENTAL RELATIONS: REFERENCE AND INFERENCE

Each of these relations founds a type of semantics.

3.1 *Reference*

The semantics of reference is fundamental in our metaphysical tradition because it aims to describe the conditions according to which language may declare what is *true*. Indeed this problem has obsessed philosophy from the *Cratylus* right up to Quine's *Word and Object* and Foucault's *Les mots et les choses.* The Aristotelian triad has been taken up almost unanimously by thinkers to this very day since it represents a system that targets the referent. Of the two movements that this system implies, movement from the signifier to the concept and movement from the concept to the referent, it is clearly the latter which has been privileged, since truth has classically been defined as *adæquatio rei et intellectus*.

There are several reasons in our view why the extensional theory of signification is insufficient for the purposes of advancing linguistics and why it is necessary to distinguish the study of signification from the study of reference.

(i) The extensional theory of signification suits formal languages but it remains to be shown how it can be applied in a coherent way to natural languages[26]. This theory is not even specific to systems of signs since, strictly speaking, only concepts are endowed with an extension (whether or not they are expressed by signs).

(ii) Linguistics considers the morpheme to be the minimal sign. Yet, most morphemes cannot be assigned any extension. It is only possible to assign reference beginning at the level of the *word* [27]*,* or at the level of *lexia*, which are syntagms and not minimal signs. Extensional semantics can therefore not be used to found a linguistic semantics.

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knowledge and information, whereas according to the other perspective, a more subjectivist orientation takes shape, inspired by Augustine" (1990, p. 1). The second current introduces considerations into logic and into grammar as well that have to do with context, situation, intention--questions that usually fell to rhetoric, that is to say, a pragmatics before the term existed (but already an English speciality!).

[26] It inevitably leads to a separation of signs into two classes: the class of signs that refer and the class that does not.

[27] Let us recall that the *word*--which is taken as the basis of reflection by the entire philosophy of language--may not be a linguistic unit. The distinction of words essentially depends on the graphic conventions of societies, those at least that have enacted such conventions.

(iii) If we admit, along with Frege, that intension determines extension, then only a purely "intensional" theory can found a linguistic semantics: it describes the relations between intensions (it might be better then to say *signifieds)* which constitute *signification* (in opposition to *designation*).

(iv) The problem of extension thus remains under the purview of the philosophy of language[28]. And its pertinence in linguistics remains subject to caution. In effect, the study of extension does not permit one to discern the relative specificity of languages: in what way would the mode of assigning referents differ for example from the Spanish to the Portugese language ?

The objections are fundamental in nature and they remain so when extensional semantics finds itself relativized and rendered more sophisticated in the following two complementary ways:

(i) Within the framework of Tarsky's theory of models, truth conditions (of the declarative propositions) are defined by "interpretations" which assign a truth value for every possible application of a predicate to each individual term of a universe constituted of individuals and predicates. This means in effect that reference (and subsidiarily truth value) is relative to the model in question. The theory of possible worlds remains confined within the same problematic. The fact that reference is defined within a model, or within a possible world, and no longer within the standard universe, doesn't really change anything in the end.

(ii) Since this theory naturally makes no room for the notion of subject nor, *a fortiori*, for the problem of cognition, certain scholars have attempted to integrate it within cognitive research by defining meaning no longer as the relation between a sign and an objective referent within a model or within the standard world, but as the relation to a correlate or "subjective" referent. This relation has been situated at the perceptual level: Woods, for example, estimates that the notion of *procedure* permits "the definition of truth conditions for elementary propositions in terms of primitive operations of sensory perception" (1981, p. 301). And it has also been situated at the "mental" level; Winograd for instance offers this definition: "From a procedural perspective, "semantics" is the study of the relationship between linguistic objects and the mental states and processes involved in their production and comprehension" (1976, p. 263). Historically, this mentalist involution has characterized the passage from a truth-conditional semantics to a cognitive semantics.

3.2. *Inference*

The mental operation involved in establishing reference is distinct from the operation that establishes an indexical referral, named *inference*. In this way, two fundamental conceptions of meaning come into view. Reference is the object of a philosophical *semiotics* that belongs to a tradition of thought dating back to the Ancients. Inference, on the other hand, comes under the heading of *semiology*, or rather *séméiology* (the term still used today in faculties of medecine): in our

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[28] The Western tradition in philosophy never managed to establish laws for the assignment of reference-- if at least we concur with Quine about the *inscrutability* of reference.

tradition, its first formulation goes back to Hippocrates and to the Cos school. The indexical paradigm in effect developed from the medical study of symptoms.

Reference establishes a relation between two orders of reality, concepts and objects--and in our view this is the reason why its study cannot belong to a specific scientific discipline, nor even to a science. By contrast, inference relates two items that do belong to the same order of reality: two objects in the case of a naive realist conception of the index, or two concepts according to the mentalist point of view.

The relata in question however do not share the same status, since inference has in common with reference the fact that it is oriented: one relatum is antecedent, the other consequent--temporally, causally or in any other way. One could say that the first is the sign of the other, like a cloud is a sign of rain. This acceptation of the word *sign* is in fact very widespread and is understood independently of the concept of "*system* of signs", thus without any particular rapport with languages. With respect to inference, our tradition generally does not differentiate between the interpretation of the world and the interpretation of the text[29]. Indices are considered as natural signs (and not as institutionalized, hence codified, signs). It is in this sense that Aristotle writes about the kinds of recognition made on the basis of distinctive signs[30] "among these signs some can be either innate (as with the starred birthmarks used by Carcinus in *Thyestes)* or acquired; and the latter can be subdivided into the physical (e.g. scars) and the external, such as necklaces or the use of the boat in *Tyro* " (*Poetics*, trad. S. Halliwell, North Carolina UP, 1987, chap. 16). Incidentally, this citation recalls that metonymy (i.e., the necklaces) and synecdoche (scars) pertain to the inferential paradigm in the same way. It also suggests that what we call "narrative intelligence" is essentially a question of inference making[31].

At a higher level, where it is no longer a question of concepts representing objects but rather of propositions that are supposed to reflect states of affairs, inference can be understood to subsume implications. For the Stoics, the indexical sign is an assertive utterance, the antecedent in an assertion of implication.

Since the Megaric School, two types of implication have been distinguished. Diodorus defined the first type as the impossibility of having, now or at some time in the past, a true antecedent and a false consequent; today this relation is known by the name *strict implication* and is defined, in C.I. Lewis's modal logic system S_2, by the expression "*it is impossible that p and at the same time not q" .*

Philon of Megara defined a conditional as true if and only if the truth of the antecedent does not coexist with the falsity of the consequent. Russell qualified this definition rather misleadingly as *material*, and the label has since stuck.

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29 For example, the natural signs mentioned by Augustine are presented in the chapter entitled *De signis interpretandis in scriptura* (*De doctrina christiana*, II, I, 2).

30 See *Poetics*, 1454 *b*, 20. Here again, these signs appears in narratives.

31 On the other hand, metaphor (at least *in absentia*) belongs to the referential paradigm for it doubles the relation that leads from sign to concept by the mediation of a literal sense (concept *a*) that relates to a figurative sense (concept *b*). If Jakobson associated and opposed metaphor and metonymy as he did, it is because he may have had the obscure intuition that these two figures were exemplary cases of the two founding paradigms of the Western reflection on signification.

Because this definition does not necessarily establish any meaning relation between the consequent and the antecedent, this type of implication cannot be linked to linguistic semantics.

Strict implication is at the basis of deductive and inductive syllogisms (cf. Aristotle, *Prior Analytics*, II, 23, 20). In a deductive syllogism, inference goes from the antecedent to the consequent; in an inductive syllogism, it goes from the consequent to the antecedent. In AI, the rules of production are situated in the very same paradigm.These rules take the form of "if *p* then *q* ", where *p* formulates a condition and *q* an action. The inference made from conditions to actions involves a method of calculation called *forward chaining* ; the inverse inference is characterized by *backward chaining* .

Most logicians and philosophers believe they know how to treat deductive inference. Inductive inference however poses more delicate problems, particularly when it is a question of constructing models of expert reasoning. Polya (1958, p. 152) presented in the form of a syllogism what is termed a "fundamental inductive schema":

A implies B
B is true
.....
A is more probable

The forms derived from this syllogism can lead to conclusions of various degrees of plausibility. However, the diverse regressive forms of causal thought can always be referred back to the fundamental inductive schema (cf. the analysis of a court decision in Polya, 1958, pp. 176-177).

Schemata (*frames*[32]) are used in Artificial Intelligence as inference supports. They are the typical structures of attributes. The occurrence of values that are associated to one or more attributes of a given frame can permit the inference of values from non-instantiated attributes, and consequently affect them by default. Thus, in the case of scripts, which are kinds of schemata whose attributes are temporally ordered, "missing" events can be filled in by inference beginning from the occurrence of either previous or subsequent events. The same is true for *plans* which are in a way modalized scripts.

These inferential reasonings in fact contribute to completing enthymemes or incomplete syllogisms. In this way, they presuppose the formulation of normative propositions or *topoï*. A *topos*, according to Aristotle, is that under which falls a multiplicity of enthymemes. Insofar as they represent typical forms, the schemata used in AI are groups of *topoï,* each one defining an attribute*.* Thus, by way of an historical filiation which to my knowledge has not been remarked, the representation of knowledge takes up and develops a domain of the Aristotelian topic.

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[32] We will present these in chapter V. Here, and throughout this section, we are trying to condense an overabundant quantity of literature--thus risking simplifications as a result of trying to be concise.

The notion of *mental models* (see in particular, Johnson-Laird, 1983) transposes this problematic onto the field of psychology[33]. These models are in fact schemata designed to describe the signification of utterances. Despite the *ad hoc* character of these models, Johnson-Laird explicitly refers them to Kantian schemata[34]. What is significant here is that "inference is linked to the handling of these mental models" (Johnson-Laird, 1988, p. 57). As well, their very construction is presented as the outcome of an algorithm that "makes valid inferences without recourse to formal rules of inference" (*ibid.*). In short, by portraying mental operations as inferential chains, the theory of mental models in effect logicizes representations not only in their construction but in their manipulation--thereby divesting the logic in question of its technical character[35].

Transposed from logic into the domain of psychology, these inferences become "informal". And they constitute the preferred object of cognitive pragmatics which has sought to develop the inferential paradigm in two ways. The inferences made from one object to another are named *pragmatic functions*. Following Nunberg, Fauconnier defines their underlying principle in these terms: "if two objects (in the most general sense) *a* and *b* are linked by a pragmatic function F (*b* = F *(a)*), a description of *a*, d_a, may be used to identify its counterpart *b* […]. For instance a function (call it $F_{1)}$ links authors with the books containing their works" (1985 a, p. 4-5). One can see that the pragmatic function in question is simply a metonymic relation. This metonymy however does not relate words as such, but rather objects (as is the case with signs of recognition in Aristotle; see *Poetics* 1454 *b*). Thus, as Fauconnier remarks that in a situation of the type «restaurant», there is a pragmatic link between the clients and the food they order (cf. 1985, p. 4). Considered as "natural signs[36]", the antecedent is named a *trigger*, the consequent a *target*, and the inference a *connector*. These elementary dispositions can then serve to explain anaphoric relations, manifested in particular discourses, and statements of the type "the mushroom omelet left without paying his bill". In accordance with the traditions of the philosophy of language, the relations depicted between objects of the world are supposed to explain the relations between linguistic signs.

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33 For a basic presentation, see Johnson-Laird, 1988, p. 53: "According to this theory, the initial mental representation of an utterance [...] is used to construct a model of the state of affairs that is described, requested or questioned. The process is guided by a knowledge of the contribution to truth conditions made by the words of the utterance, by a knowledge of how to combine meanings according to syntax (probably on a rule-by-rule basis), by a knowledge of the context, which in part is represented in the existing model of the situation, and by general knowledge of the domain and conventions of discourse "

34 There is nothing exceptional in this. Certain aspects of Kant's theory of schematization have been popularized in psychology by Otto Seltz and Bartlett.

35 The notion of mental model thus becomes an unstable hybrid situated between the Tarskian notion of model and the notion of preconception. Even the expression "mental model" reflects a compromise (hence its success), since the term *model* alludes to logic, and the term *mental* to psychology.

36 *Natural signs* are considered to be objects between which one can discern a semiotic relation.

In cognitive pragmatics, "informal" implications have been circumscribed by the theory of implicatures[37]. By introducing the notion of implicature, Grice was aiming to broaden the concept of strict implication and to complete the concept of material implication; in short, he wanted to make the non-technical notion of implication more precise. Every implicature presupposes a distinction between what is said and what is implied (non-formally) by the utterance. *Conventional* implicatures are added to the «normal» meaning of words. For example, if someone says that the room you're in is a pigsty, then it is implied that the room is untidy and disorderly[38]. *Conversational* implicatures are apparently established at a higher level, that of utterances. For example, if someone tells me that *it's cold here* then he is affirming the proposition that it's cold here, but he might as well want to suggest that it would be a good idea to close the window. While the distinction between types is not always very clear, the notion of implicatures has given rise to a copious amount of scholarly literature (see for example the theory of *implications* in Sperber and Wilson, 1989). By and large this literature has taken up, within a mentalist paradigm, the studies of linguistic presuppositions that were originally developed within a logical framework.

Cognitive pragmatics has reformulated, in every case that we know of, the ancient division between literal meaning and derived meaning (previously called "allegorical" or "figurative" meaning). And whereas logical semantics takes literal meaning as its object (since one cannot attribute truth values to figurative expressions), pragmatics shows a decided predilection for derived meanings and for their conditions of derivation. Thus both paradigms share the question of meaning, in conformity with the syntax/semantics/pragmatics tripartition. This tripartition derives from the *trivium,* where semantics continues logic, just as pragmatics takes over from rhetoric[39].

4. UNIVERSALISM, RELATIVISM AND DETERMINISM

1. Logical semantics and pragmatics complete and oppose each other again because reference (whether relative or not to a model) is the fundamental relation treated by the first paradigm, whereas for the most part the second treats

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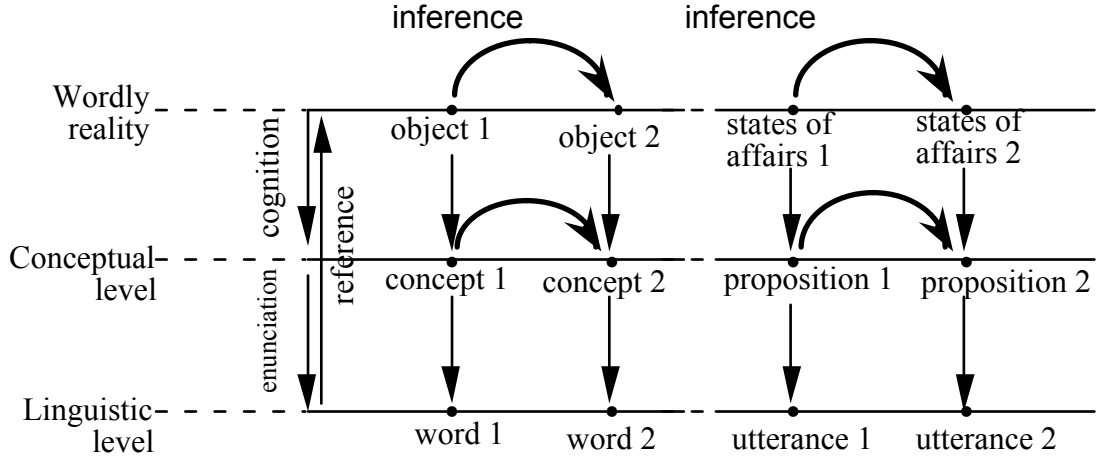
37 Grice's term "implicature" is commonly used in linguistics and the philosophy of language. Ancient rhetoric designated the idea of *implicatures* under the label "figures of thought".

38 Here I am using an example given by Sperber and Wilson (1986, p. 236) who comment on the utterance in this way: "This is a highly standardised metaphor. Typically, such examples give access to an encyclopedic schema with one or two dominant and highly accessible assumptions. Thus pigsties are strereotypically filthy and untidy. When [the uttereance "This room is a pigsty"] is processed in this strereotypical context, it will yield the implication that the room is filthy and untidy". This explanation clearly situates itself at the level of conceptual representations (schema, stereotype, hypotheses), and not at the level of semantic units, where the "schema" would simply be a sememe and the "dominant and easily acessible hypotheses" would represent its components (semes), that is to say, parts of its definition.

39 For an examination of the triparition and its affiliation with the *trivium*, see Rastier 1988 and 1990 a.

inference[40]. The concept of literal meaning is central since here both inference and reference find their origin once they are related to linguistic signs.

The two traditional conceptions of signification, the semiotic triad and the *sêméion*, are articulated in cognitive research in a way that attests to the durability and vivacity of the philosophy of language. The following diagram presents a visual image of the problem:



In the above diagram the conceptual level obviously has a preeminent function: it mediates the reference of expressions; it also determines the inferences that one can draw from these expressions.

This diagram moreover departs from the formal paradigm strictly speaking by virtue of its mentalism for it in effect excludes direct denotation (from expressions to objects), an exclusion which for example enabled logical positivism to eliminate any interference from psychology.

The definition of the conceptual level is crucial within the debate that opposes logical and psychological theories of the concept. This debate remains

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[40] As we have indicated elsewhere (Rastier, 1988), there are no lack of disputes (on indexicals for example). Intensional semantics wants to account for inferences just as pragmatics seeks to deal with the problem of reference (Nunberg's theory presents itself for example as a theory of reference). But these overlappings do not prohibit an occasional delegation of powers: pragmatics sometimes appeals to logical semantics in order to define the truth value of literal meaning, and logical semantics relinquishes figurative or derived meaning to the benefit of pragmatics.

courteous since, failing to psychologize logic, one can always logicize psychology, by presenting the conceptual level as being articulated by a formal mental language (Fodor), or as being occupied by mental models constructed and utilized by algorithms (Johnson-Laird). Finally, this diagram leaves no room for a linguistic semantics because meaning is depicted as being nothing other than a representation. There exist no signifieds other than concepts or propositions, and of course these are independent of languages.

The notion of *langue* does not come into consideration and this diagram is valid for all language. Sperber and Wilson write for example that "in the broadest sense, a language is a set of well-formed formulas, a set of permissible combinations of items from some vocabulary, generated by a grammar. In a narrower sense, a language is a set of semantically interpreted well-formed formulas. A formula is semantically interpreted by being put into systematic correspondance with other objects: for example, with the formulas of another language, with states of the user of the language, or with possible states of the world. A language in this narrower sense […] is a grammar-governed representational system" (1986, p. 172-73). The difference between *langue* and *langage* does not appear here at all[41]. Linguistic signs are not distinguished from the symbols of formal languages, and thus their meaning derives from their interpretation, that is to say, from their being placed in a term-to-term relation with the realities of a non-linguistic order: mental states or states of affairs[42].

Under these conditions it is impossible for a linguistic semantics ever to be realized. Such a semantics would have to analyze the relations between signifieds within a given language in an autonomous, if not independent, fashion with respect to psychology or ontology. But such a project is generally regarded as neither pertinent nor useful. Thus, maintaining the Aristotelian triad effectively prohibits semantics from belonging to linguistics, and places it under the dependence of an ontology that by itself would be capable of relating words to the world--by the mediation of concepts.

This mentalist position governs all of the current cognitive semantics and in effect permits them to define themselves as such. But this point is not without difficulties; these difficulties affect the definition of mental units (concepts, schemata, models, the symbols and propositions of a mental language) just as they subsequently affect their relation with linguistic units[43].

Two examples will permit us to discern their origin. In *Relevance,* Sperber and Wilson (1986, p. 191) criticized the "principle of effability" advanced by J.J. Katz according to whom "each proposition (thought) is expressible by some

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41 The chapter is nevertheless entitled *Aspects of verbal communication*. It is really a question here again of trying to reduce the differences between natural languages and formal languages: words are in effect considered as symbols to which one assigns an interpretation.

42 Interpretation that uses the formulae belonging to another language only succeeds in sidestepping the problem. In order to simplify we might retain this definition "the 'meaning' of a word is provided by the associated concept" (*ibid*. p. 90).

43 We will not enter into a discussion here of the relation of these cognitive semantics with objects and with states of affairs, which poses a number of problems that are far from trivial.

sentence in every natural language". The idea, basically speaking, is that for every thinkable thought there exists in each language a phrase that can express it perfectly. Without doubting for a moment that thought assumes a logico-propositional form, Sperber and Wilson express this disagreement: "why, then, do natural languages contain so many sentences which encode not thoughts but merely incomplete logical forms" (p. 191-92). They thus conclude that "quite generally, a single sentence, or even a single sense of a sentence, does not correspond to a single thought, and a single thought does not correspond to a single sentence" (p. 262, footnote 8). In order to delve into the complexities of this debate one would have to admit, as many of its confident protagonists do, that one can *enumerate* thoughts.

What is valid here for thoughts (or propositions) is valid also for those units of an inferior level named concepts. For example, Jackendoff (1987, p. 324) regrets that "language is not always systematic in assigning one word per concept". He thus takes as a given that one can *enumerate* concepts, independently of their expression.

We consequently find ourselves faced with the problem of the correspondance between the conceptual level and the linguistic level. As we have seen, the most common way of resolving the problem consists of imagining the conceptual level as a formal language, the language of thought (cf. Fodor, 1975, and Kintsch, 1974). Such a language is composed of logical propositions[44] strung together by inferences and decomposable into concepts (or words of a mental language).

The meaning of words and of sentences thus resides in their translation by the concepts and propositions which correspond to them in the mental language. The optimists, like Kintsch, affirm that "the words of natural language correspond virtually one-to-one with the words of the mental language" (the expression is from Johnson-Laird, 1988, p. 50). More prudent types, like Sperber and Wilson, emphasize that "semantic representations are incomplete logical forms, i.e. at best fragmentary representations of thoughts" (1986, p. 193).

Whatever one might say about this alleged imperfection, a paradox remains: the language of thought also has, like all language, its semantics and syntax. In this connection P. Ouellet quite aptly remarks that "Jackendoff's conceptual structure, which is the locus of *meaning*, has its own syntax and semantics (see Jackendoff, 1983)--as if "meaning", which is only one of the dimensions of language, contained the very structures of language (*la langue)*, thus constituting a kind of "mise en abyme" of the linguistic system as a whole" (1989, p. 217). In fact, meaning is simply not considered as one of the dimensions of language. A language is reduced to a syntax and a phonology. Here's how: "The processes that we generally call "rational thought" are computations over conceptual structures, which exist independently of language (…)" (Jackendoff, 1987, p. 323). In this way, language is pared down to a syntactical structure and a phonological structure, that

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[44] The consensus on this point extends right into pragmatics--apparently for reasons of facility: "There is a very good reason for anyone concerned with the role of inference in communication to assume that what is communicated is propositional: it is relatively easy to say what propositions are, and how inference might operate over propositions." (Sperber and Wilson, 1986, p. 57).

is to say, it is a pure signifier. This reduction is entirely consonant with the Aristotelian tradition, prolonged by Saint Augustine and Saint Thomas: we have already seen that this line of thought designated the linguistic sign by the word *vox*, simple phonetic unit, and by the word *conceptus* the corresponding representation, naturally considered as universal and independent of natural languages. This is why logic has always taken the place of semantics.

In this sense, languages have nothing more than an ideographic role: they take note of thoughts. Herein lies a recurrent theme in our philosophic tradition (see for example the third volume of Destutt de Tracy's *Éléments d'Idéologie* [45]). And this theme has been revived by Jackendoff who, to the question "How does language help thought?", answers that it *facilitates* it (1987, p. 323); he writes: "if a conceptual structure can be placed in registration with a syntactic structure and a phonological structure--that is, if it can be expressed linguistically--it is thereby stabilized in memory (…)[46]" (*ibid)*.

A question emerges from this however: isn't the conceptual level, where the language of thought is situated--as were the "deep structures" of yore--not at the same time a reification of the imperatives of dogmatic rationalism and an idealized image of language ? Without going that far, we might at least point out that the mental language, in the various presentations given of it, is a blend of logical symbols and of words. Could it be that the supposed universal concepts are only words, that by chance turned out to be in English and generally written in capital letters ? The hypothesis cannot be dismissed--at least by whoever considers scepticism to be the primordial scientific attitude, and who judges nominalism to be indispensable to the progress of linguistics[47].

How did orthodox cognitivism ever remain there ? In fact, the philosophic stakes involved in the separation of language and thought are of considerable importance and deserve to be stressed. Despite their avowed monism, the orthodox cognitivists repeated the divisions characteristic of dualism: hence the separation of form and substance (which enables cognitive functionalism, cf. chap. 1); the separation of the intelligible and the sensible (rearticulated by Fodor's modularism, cf. *infra*, chap. VIII and IX); and in the present context, the separation of the conceptual and the linguistic. These divisions allow for an homologation: at the dominant pole, that of the mind, one finds the formal, the intelligible (the central processor according to Fodor), and the conceptual; at the inferior pole, locus of inessential variabilities, one finds substance (natural or artificial), the sensible (peripheral modules), the linguistic (reduced to the syntactic and the phonological). These three instances are closely linked with matter or substance. Thus orthodox cognitivism reiterates the principal theses of the Western idealist tradition--but

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45 For a detailled analysis, see Rastier 1971.

46 In his introduction, Jackendoff announces "a decisive break with most of the philosophical tradition on meaning" (p. xii). How is one to take this emphatic declaration seriously, when after all the author is presenting the ideographic conception of language as something new ?

47 On the durability of realism in the philosophy of language, see Rastier, 1990 a.

without realizing it and in a rather bland way since it is deprived of any reflexive dimension[48].

The separation between the conceptual and the linguistic is maintained with the help of several oppositions. On the one hand, concepts are judged to be universal and it is tempting to trace them to our "genetic endowment", a secular though entirely modern avatar of Providence. On the other hand, linguistic signs vary from one language to the other.

Secondly, the Aristotelian maxim according to which there exists only a science of the general is seen from the perpective of universality within the formalist conception of science (see chap. II on universal grammars); thus the belief that knowledge of the conceptual level alone is sufficient to guarantee the scientificity of the description of the linguistic level.

Beyond this, what is at stake is the inability of languages to express what is true. More exactly, truth cannot reside in signs nor in the relations between them, but only within concepts or, more precisely, within the relations between the objects that these concepts represent. In criticizing nominalism[49], Leibniz refuses to "distinguish truths by signs" and concludes that "it would be better to assign truth to the relationships amongst the objects of the ideas [. . .]. That does not depend on languages, and is something we have in common with God and the angels. And when God displays a truth to us, we come to possess the truth which is in his understanding, for although his ideas are infinitely more perfect and extensive than ours they still have the same relationships that ours do. So it is to these relationships that the truth should be assigned; and we can distinguish *truths*, which are independent of our good pleasure, from *expressions* which we invent as we see fit" (*New essays*, IV, chap. V, § 2). According to Leibniz it is from this defiance vis-à-vis languages that were born not only the project of a *characteristica universalis* which would constitute the alphabet of human thoughts (the cognitivist theories of primitives are the inheritors of this idea) but also the project of a formal language, which permitted both the development of computer science and of universal grammars[50]; both are supposed to at least avoid the alleged shortcomings of languages--if not redeem them.

God has absented himself little by little from language theories, but the dogmatic separation between languages and thought remains, upheld by the opposition between the universality of concepts and the variability of linguistic signs.

2. We do not intend to enter into the tiresome debate on the relations between language and thought--a debate that is being revived at present by theories on the relations between language and cognition. In effect, if we have some idea of what a natural language is, the nature of language and the very notion of language itself remain conjectural. One usually employs the word *thought*

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48 In his own time, Heidegger judged that cybernetics represented the culmination of Western metaphysics. This decidedly excessive judgment nonetheless shows a certain clairvoyance.

49 Precisely those "who pleased themselves in believing essences, species, nominal truths" (*New essays*, IV, chap. V, § 2).

50 The theory of formal languages is divided into a theory of automata and a theory of grammars.

in order to designate all manner of mental processes, most of them poorly understood, and in such a way that these processes cannot be apprehended as a unity. Progress in the neurosciences and in what there is that is most promising in cognitive research, will enable researchers to gradually leave the stage of philosophical opinions.

One could certainly repeat without further ado that there exists a conceptual level, and attribute units and rules to it, in order that it might then be used to explain linguistic phenomena. But would this have any other outcome than to maintain linguistics under the age-old domination of the philosophy of language ?

The opposite approach consists of comparing languages with the aim of locating universals that would provide the key to the conceptual level. Such research has produced interesting results. On the one hand the principles of such an approach lead one to draw conclusions about the universal on the basis of the general[51]; on the other hand, it engages one to attribute to the human mind the semantician's methodological universals, and it is not rare to find Aristotle's categories figuring incognito among conceptual universals (cf. e.g. Sowa, 1984, pp. 415-419).

Whether it follows an inductive or a deductive approach, the universalist hypothesis finds itself destroyed by its own force: it eludes all positive validation, and invalidation as well, and remains confined to the sphere of beliefs. Because it postulates the separation of language and thought, it also finds itself bound by the two aporias that Benveniste[52] has most lucidly described:

"It is in the nature of language to give rise to two illusions of opposite meaning: being learnable, consisting of an always limited number of elements, language gives the impression of being only one of the interpreters possible for thought, while thought, being free, autarchical, and individual, uses language as its instrument. As a matter of fact, whoever tries to grasp the proper framework of thought encounters only the categories of language. The other illusion is the opposite. The fact that language is an ordered totality and that it reveals a plan, prompts one to look in the formal system of language for the reflection of a "logic" presumably inherent in the mind and hence exterior and anterior to language. By doing this, however, one only constructs naïvetés or tautologies" (*Problems in General Linguistics*, University of Miami Press, Coral Gables, Florida, 1971, p. 63).

There exists another possibility which is independent of the dogmatic positions rehashed by orthodox cognitivism; such a position touches upon the universality of concepts and can be affiliated to an empirical tradition that goes back to Epicure: the diversity of signs is the outcome of the diversity of experiences[53]. For a long time forgotten because of its incompatibility with

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51 This is logically impossible.

52 In a famous article ("Catégories de pensée et catégories de langue", 1966), Benveniste showed--following Mauthner--that the Aristotelian categories were simply transpositions, to the philosophic sphere, of categories specific to the Greek language.

53 "And so names too were not at first deliberately given to things, but men's natures according to their different nationalities had their own peculiar feelings and received their peculiar impressions, and so each in their own way emitted air formed into shape by each of these feelings and impressions, according to the differences made in the different nations by the places of their abode

theological good sense, the idea of a variability of concepts has been reformulated by Boas within an anthropological framework and by Sapir in linguistics. This relativist thesis can be expressed as follows: to the diversity of languages corresponds a diversity of concepts conveyed by these languages.

Another thesis touches upon the relations between thought and language. In contradistinction to the standard conception which holds that the linguistic level is determined by the conceptual level, this thesis poses the inverse determination, which earns it the name of *linguistic determinism*. Herder formulated this subversive idea in 1768: "If it is true that we cannot think without concepts and that we learn to think thanks to words, it is because language provides the whole of human knowledge its limits and its contours[54]". This thesis was taken up in a rather confused way by Humboldt and his epigones, and later found expression in linguistics with the theory of semantic fields, notably in Trier and Weisgerber whose borrowings from Humboldt are evident. Trier for example affirmed: "We project a network of words on what we apprehend in a confused and cloudy way in order to seize it by way of a destructuration and in order that it may be contained by well-delineated concepts. The creation of concepts with the help of words is an explicatory process that effectuates a decomposition beginning with a totality. In this process, language does not reflect what is really existent but creates intellectual symbols, while reality itself, that is to say, the reality present to us, is not independent from the type and construction of symbolic linguistic structures." (1931, I, p. 2)[55]. Trier thus maintains a division between the conceptual and the linguistic; his position evidently remains dualist but is not really determinist.

Sapir knew Humboldt but, far from the Germanic nationalism of his epigones, he formulated the determinist thesis in full-scale: "The fact of the matter is that the "real world" is to a large extent unconsciously built up on the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached." (1929a, p. 209).

The two theses known as linguistic relativism and linguistic determinism, conjoined under the label "the Sapir-Whorf[56] hypothesis", have been contested

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as well" (*Letter to Herodotus***,** in *Epicurus, The extant remains,* Cyril Baily (ed), Georg Olms Verlag, New York, 1989, pp. 48-49). Here Epicurus is speaking of the origin of languages; conventions, according to him, will later stabilize usage.

54 And he adds, with contagious enthousiasm, that "This general consideration on human knowledge thanks to and by means of language will necessarily produce a negative philosophy […] What things one will have to sweep away !" (*ibid*.).

55 This idea is very different from the conception promulgated by certain people in semiotics and structural semantics (Hjelmslev and Greimas in particular): semantic fields would be universal conceptual zones that languages delimit in different ways. The example of colors is often cited (for a discussion, cf. *infra*, chap. VII). But, even when these colors are indicative of differences, the correspondences that are established for them are misleading: conceptual zones vary with different cultures, and doubtless with different languages. For example, in his study of color names in mbay, Caprile (1974) pointed out that the notion of color does not have the same range as in French.

56 Whorf radicalized the ideas of his mentor. His work, stimulating and unique, unfortunately remained unfinished. The hyphen that unites the two authors hardly allows justice to be done to them.

even within the field of anthropology by Berlin and Kay and by Rosch in psychology (see *infra*, chap. VII).

If even a moderate form of cognitivism would be opposed to this hypothesis it is evidently because it not only undermines the universality of the conceptual but also its determinate role. Thus Schank for example who, criticizing Sapir and Whorf, declares that "it is necessary to reject the idea that thought cannot exist independently of language" (1975, p. 8) and consequently goes about defending the traditional dualism that enables the instrumentalist conception of language to be conserved. In this way languages, one could say, are the assorted servants of a single master and each fulfills the same duty in its own way.

Sapir and Whorf preoccupied themselves more with cultural representations than with thought *in abstracto*, and more with natural languages (*les langues*) than with language. It is unfortunate that with the development of universalism credence was given to the idea that their hypotheses were oudated or invalid. However the situation is such that the "decidors" have elected to invest in research on universals with the consequence that-- cultural uniformization helping along the way--it will be increasingly difficult to test these hypotheses in a rigorous and decisive way[57].

In what follows we will hold to the tempered opinion that the signifieds of both natural languages and mental representations are cultural formations. These two formations are separate and they condition each other mutually. Their unity however is of such a nature that a dualist position that would admit a unilateral determination leading from the signified to a representation, or the inverse for that matter, would prohibit any apprehension and understanding of the complexity of their interrelations.

Their distinction is attested to by the respective autonomy of semantics and psychology; their interrelationships are attested to by the cooperation between these two disciplines. All in all, if the sterile debate that has opposed thought to language for two and a half millennia concludes unflinchingly that the second is determined by the first, the novel idea (only two centuries old) of an inverse determination raises a necessary doubt; but it maintains a duality that has to be surpassed--though in this case the notion of determination is doubtless too strong.

In our own domain, we have formulated the hypothesis that the semantic structures of a text *constrain* the mental representations that arise from and accompany its enunciation as well as its interpretation, without necessarily determining them in the strong sense of the term (cf. *infra*, chap VIII).

In their capacity as anthropologists, Sapir and Whorf identified the missing link: the modern concept of culture--very much different from the doubtful notion of *Volksgeist* advanced by Humboldt and his successors. It is as culturally relative formations that "language" and "thought" find their unity: through its various uses a language serves as a vehicle for norms (fixed doxa) that are easily matched with representations to the extent that they both proceed from the same cultural system.

The non-determinist relativism that affirms itself in this way permits a break with logocentrism--the linguist's peccadillo. Language certainly remains the most

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[57] Whereas research programs were halted beginning in the middle sixties, at the same time as the expansion of classical cognitivism.

important semiotic system, but other systems (musical, gestual, etc.) are subject to the same problematic and constraints.

Finally, this relativism anchors linguistics and the various semiotics in the social and historical sciences; biological factors appear as distant considerations[58].

5. DIFFERENCE

Apart from the referential and inferential paradigms we must distinguish a third one, that of *difference*, in order to specify the conditions of a relativist semantics capable of identifying and describing particular languages.

The problem of differentiation is by all accounts a fundamental philosophical problem that pertains to the distinction of objects and that of concepts as well. As for objects, Xenophanes noted the differential character of their perception: "if God had not made honey golden, figs would appear softer to us" (fr. 38). This relativist theme[59] is recurrent in aesthetic reflection, as Alberti for example attests: "The big, the small, the long, the short, the high, the low, the straight, the large, the clear, the obscure, and all other qualities that can or cannot affect objects, and which are given the name "accidents" by philosophers, are such that we can know them only by comparison" (cited in Argan, *Brunelleschi*, Paris, Macula, 1981, p. 66). The notion of *Gestalt* perpetuates this paradigm, and our own study on semantic perception (chap. VIII) explores it in depth.

It is in the Platonic theory of division that Western philosophy finds the source for the idea of the differentiation of concepts. Following synthesis (cf. *Phaedrus*, 265 d), division figures as the essential aspect of dialectics[60]. Division in fact leads to a *definition* of the concept (name of the word), and also to a typology of oppositions, either private (ex. Greek, barbaric) or qualitative (ex. male, female; cf. the *Sophist* 262 c, 263 b). In the *Philebus* the problem of relative terms is posed (like *hotter* or *colder*) which can only be determined by the introduction of fixed numerical relations. This determination creates *mixtures*: for example, the relation of one to two, introduced into the relative dyad of the acute and the grave, produces an octave. Here Plato is posing the problem of *discretization* that today is treated in terms of categorical perception. Aristotle takes up the problem of oppositions in the *Topics* and the result is a four-term typology: relatives, contraries, privatives (possession and privation) and contradictories. But it would be erroneous to believe that these terms represent words; they are the subjects or

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58 Cf. Sapir: "Language is primarily a cultural or social product and must be understood as such. Its regularity and formal development rest on considerations of a biological and psychological nature, to be sure. But this regularity and our underlying consciousness of its typical forms do not make of linguistics a mere adjunct to either biology or psychology" (1929 a, p. 214). The Chomskian program is contested here in advance; for a discussion, cf. *infra*, chap. IX.

59 For Xenophanes, this theme is linked to a negative and critical theology that in fact isolated him from "official" history. This theology was continued in a form of agnosticism: "Of all things we have but impressions" (fr. 34). Xenophanes's name often figures in ancient lists of atheists.

60 In the *Sophist*, dialectics was defined as the art of composing mixtures, but the *Philebus* reconciles the two by establishing how this composition permits the classification and division into species.

the attributes of propositions, that is to say, they are concepts. In the *Categories* and in the *Metaphysics* (book Δ) one does find reflections on homonymy and synonymy, but these only serve as preliminaries to an analytic of concepts.

It is only much later, beginning with reflections on synonymy, that the essential problematic of semantic linguistics was formed. Systematizing the diverse and scattered observations of Varron, Donat, Servius and, among the Moderns, Vavasseur, Scioppius, Henri Étienne, l'abbé Girard dared to write in his *Traité de la justesse de la langue française* that "there are no synonymous words in any language[61]" (1718, p. 28), and thus foreshadowed the differential paradigm in semantics.

How can one appreciate the difference between synonymous words ? One might suggest that the answer lie in the ideas associated with these words. But if each word has a different meaning then the triadic model of signification no longer functions. In effect, two synonymous words in the broad sense of the term--let's say *automobile* and *car* --refer to the same object. Could one then contend that they are associated to two different concepts ? No, they associated to a single concept or principal idea. If however we take synonymy in the strict sense we are obliged to accept that they refer to two different concepts by virtue of their accessory ideas[62]. By rights, two different concepts should in turn refer to two different objects. Thus cars wouldn't be automobiles.

Two avenues are open in order to circumvent the aporia we have just formulated. The first upholds the principle (today we would call it *cognitive*) that language is only the translation of ideas. First of all one has to take account of accessory ideas: they would in fact derive from the association of ideas. Dumarsais proposes this solution since it maintains the autonomy and preeminence of the conceptual level (cf. *Traité des tropes*, XII) and this permits him to extend Girard without having to contest the millenial relation which goes from the idea to the sign[63] (cf. the end of his *Traité*).

We could say that the entire *Traité des tropes* consists of studying, by the intermediary of natural language, the relation between principal and accessory or

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61 This is true, if one understands by "synonyms" words that have a "resemblance of signification so complete and perfect, that the meaning, taken in all its force and in all its possible circumstances, is always and absolutely the same". On the other hand, "if one takes the term "synonyms" in a broad sense, designating a simple resemblance of signification, then there are synonymous terms, that is to say, words that express the same principal idea" (1718, p. 27).

62 "An accessory idea is an idea that is awakened in us at the instigation of another idea. Once two or more ideas have been excited in us at the same time, and if subsequently one of these is excited, it is rare that the other is not excited as well; and it is the second that we call accessory" (Dumarsais, 1797, t. V, p. 231).

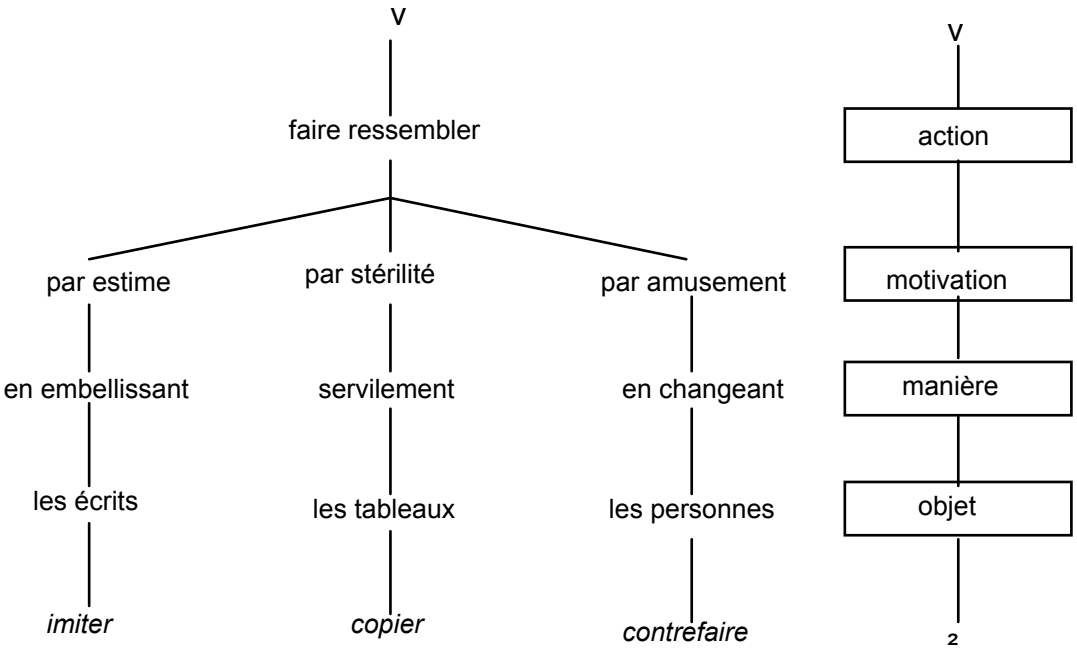
63 And there are a number of reasons that confirm in his view why perfect synonyms do not exist: "1. If there were perfect synonyms, there would be two languages within a single language. When we have found the exact sign for a given idea, we do no go about searching for another [...] 2. It is utterly useless to have many words for a single idea [...] 3. The richness of a language must be judged by the number of thoughts that it can express and not by the number of articulations of voice" (1988 [1730], pp. 236-237). In *Cartesian Linguistics* Chomsky saw something of himself in Dumarsais's "conceptualism", thoroughly traditional and cognitive before its time. That Dumarsais is decidedly more Lockean than Cartesian matters very little here: this supposed historical affiliation is only an ideological encounter.

associated ideas. This solution is generally adopted by grammarian-philosophers, at least right up until Destutt de Tracy.

It is worth mentioning however that the distinction between principal and accessory ideas obscures the ontology of the concept as well as disconcerting its supposed universality. It is certainly possible that principal ideas are universals, or that their components are. Even if Locke estimates that their combinations vary and consequently render translation delicate (cf. *Essay*, II, 23, 6), we could note along with Hume that "among different languages, even where we cannot suspect the least connexion or communication, it is found, that the words, expressive of ideas, the most compounded, do yet nearly correspond to each other" (*Enquiry*, chap III). This generality is but a substitute for a lost universality.

Another avenue consists of admitting the irreducibility of natural languages and the specificity of their semantics, a specificity marked above all by their respective lexicons. However this distinctiveness could not be recognized as such because the Enlightenment confounded meaning and representation and considered ideas to be universal: hence the project of general grammars, all of them founded upon a logic of ideas.

Sometimes, however, descriptive practice exceeds theory; and for example d'Alembert's work on synonymy prefigures (retrospectively) what a linguistic semantics might be. He wrote at least fifty articles dealing with synonymy for the *Encyclopédie méthodique*. Here is how he distinguished between *imitate, copy,* and *counterfeit*:



This example[64] suffices to explain why many scholars have seen in the Enlightenment reflections on synonymy the origin of semic analysis (cf. Glatigny, 1980); it also indicates relations of contextual preference, for example that *to copy servilely* is better than *to imitate servilely* [65].

These few remarks certainly do not exhaust the contributions of the Enlightenment to the semantics that was to develop later. One would have to mention the contributions of lexicography generally, aside from the dictionaries of synonyms that abounded after Girard. And in connection with synonymy again, one might recall how Condillac extended Girard's principle to periphrases, by contesting the equivalence of expressions that have the same reference (cf. *L'art d'écrire*, 1755, pp. 552 ff.).

As for the synonymics of the Enlightenment we will conclude by saying that it served to inaugurate a new paradigm[66], whose development remains unfinished even today.

We can still acknowledge Bréal's insight, who is the initiator of semantics in France, when he referred to "our fathers of the school of Condillac" (1897, p. 255), and Auroux's as well, when he retraced the origin of the Saussurian concept of *value* to the synonymics of the Enlightenment. This question is central to our proposal: linguistic meaning is not (or not only) constituted by *reference* to things, or by *inference* between concepts, but also and firstly by the *difference* between linguistic units.

We can bypass the discussion of the use Girard makes of the term *value*, commonplace enough during his time, in order to examine a marginal note of Saussure: "if linguistics were an organized science, […] one of its affirmations would be: *the impossibility of creating a synonym* as being the absolute and most remarkable thing which imposes itself among all the questions relative to the sign" (cited by Engler, 1968, p. 8). If Saussure can be placed within the same tradition as the synonymists (cf. his famous analysis of the *mutton* /*sheep* opposition), he nevertheless in our view goes beyond them with his definition of *value* which relates the definition of linguistic units--thus semantic--to three principles[67]:

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64 I am using the same format presented by Auroux, 1984, p. 100.

65 We do not conclude however, as Auroux does, that *to copy servilely* is incorrect. Such a conception of semantic rules is too strict. Let us say that the isotopy of *to copy servilely* is stronger (by the recurrence of the trait /pejorative/).

66 On Girard's synonymics, Auroux remarks that "we are doubtless authorized to speak of a *revolution*" (1984, p. 101). In order to assert Girard's theses as novel, we would have to justify why we haven't yet mentioned Prodicus of Ceos. This Sophist wrote a treatise, lost today, on the properties of terms (*Peri onomaton orthothêtos*) certain theses of which were known to the critics of Plato (cf. in particular *Euthydemus 277 c, Meno 75 c*): therein he defends the idea that there are no perfect synonyms. But this is insufficient to allow us to speak along with Auroux of a "Prodicus-Girard axiom" (cf. 1986, p. 73), nor is it sufficient to permit us to reconstitute a differential paradigm that would have the same breadth, authority and historical continuity as the inferential and differential paradigms. It remains certain though that the Ancients at least tasted the delights of *differentia verborum*. We might note finally that Prodicos was not impious only by virtue of this form of nominalism. He otherwise defended Evhemerist theses, supporting the idea that Gods were first useful objects and beneficent men.

67 Here I am following Auroux, 1986, p. 296, and also the *Course in General Linguistics*.

i) Value is the veritable reality of linguistic units; ii) it is determined by the position of units within the system (thus by differences) ; iii) nothing preexists the determination of value by the system: "there are no preestablished ideas, and nothing is distinct prior to the appearance of language (*la langue)* ".

From the point of view of signification, these theses authorize a departure from the traditional viewpoint which maintains that there exists a conceptual level, autonomous with respect to the linguistic level, but preexisting and preeminent in relation to it[68]. They also inevitably impose a distinction between *signified* and *concept* (that Saussure himself however hesitated to articulate in a firm way, presenting it rather as "an important question of terminology" (see the first pages of § 1 of the first chapter "The nature of the linguistic sign"); for a discussion see Rastier, 1990 a).

As a consequence, one has to admit that the content of a sign is not a universal concept[69], but a signified relative to a given language. Saussure does not articulate this conclusion explicitly, but he does present the conditions that permit its formulation. The concept of value moreover explains the *law of repartition* (loi de répartition) that Bréal, in developing the research of the synonymists within an historical perspective, defined in the following way: "We designate by the term *repartition* the intentional order as a result of which words that ought to be synonyms, and that ineffect once were, took however different meanings and can no longer be employed interchangeably" (1897, p. 22). He concludes: “The history of language is a series of repartitions" (p. 29).

The creation of the concept of *value* permits the strengthening of the differential paradigm in linguistic semantics[70]. Without going into the history of this paradigm, we might recall the principle axes of its development, either already recognized by linguists or foreseeable by them.

(i) The concept of value can find its foundation in the perceptual principle of dissimilation (cf. *infra*, chap. VIII, on semantic perception). This would explain not only the panchronic character of the law of repartition but also for example the generality of linguistic tautologies (cf. Rastier, 1987 a, chap. VII).

(ii) To say that a linguistic signified is relative to a natural language defined as a system is to say that this signified can be exhaustively analyzed in relations of opposition. As such the signified would be analyzed as a number of relational markers, which differentiate the semantic class to which it belongs from other classes (generic markers), or which differentiate it within its own semantic class (specific markers). The markers that make up a given signified are denominated by

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68 To the instrumental conception of language that is dominant among the orthodox cognitivists in particular, we wish to advance the opposing view: namely that a language is not an instrument but rather an historical condition, a *milieu*. Secondly, though it is of course used to communicate, language cannot be reduced to this function. Only an instrument is determined and defined by its function.

69 "If words stood for pre-existing concepts, they would all have exact equivalents in meaning from one language to the next; but this is not true" (*Course*, p. 116).

70 Auroux quite aptly remarks: "the most immediate source for the Saussurian conception of value is probably the theory of synonymy. This point does not disparage Saussure's invention in the least, nor more than it makes "precursors" of the synonymists" (1985, p. 298).

intralinguistic paraphrases which themselves are relative to the language described. They are definitional elements (and not descriptions of the denoted "object"): for example /for edible things/ is a semantic component of (or *seme*) "oven" compared with "kiln" (which includes, by reciprocal relation, the trait /for inedible things/.

These language-relative semantic components should not be confused with other types of markers defined by non-differential semantics: in particular (i) referential markers, which in certain semantics of denotation, are the necessary and sufficient conditions for pairing an expression with an object; (ii) primitives or archetypes, that, in a number of structural or cognitive semantics, are considered to be conceptual atoms independent of languages[71]. (cf. *infra* chap. IV).

(iii) If the signified of a word (more precisely: of a lexia) is defined in terms of value, the differences that make up this value determine its operative content, that is to say, the sum of its combinatorial possibilities in texts. Each seme determines contextual valencies[72]. The representations attached to the signified of a given lexia constitute its eidetic content[73]. These eidetic contents do not belong to linguistics in the narrower sense, but to psychology and, beyond it, to sociology.

The operative content *constrains* the eidetic content, without however determining it in a strong sense. The study of this constraint might lead to the establishment of a privileged rapport between linguistics and psychology, provided that the latter recognize the existence of operative contents.

(iv) Since the specific markers of a signified are defined within a semantic class, the definition of classes is of primary importance. On the paradigmatic axis, classes of lexias are obtained by commutation[74]; on the syntagmatic axis, by the detection of co-occurrences. In the final instance, semantic classes involve social norms (which form the object of a encompassing pragmatics): for example, in French, the class of vegetables that typically belong to stews (French: "pot-au-feu")[75].

These classes are therefore not classes of referents, as natural or artificial species, according to Rosch (cf. *infra*, chap. VII). They are also to be distinguished from language-independent conceptual formations that cognitive linguistics has

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71 The belief that semes were universals and small in number doubtless retarded the development of differential semantics (cf. Rastier, 1987 a, chap. I); such a belief bears witness to the staying power of traditional problematics. One recognizes that by admitting the possibility of semantic decomposition, a certain subsidiary aspect is maintained: the conflicts between paradigms are present in componential semantics and in other semantic theories for the very same fundamental reasons.

72 In particular, by the integration of the sememe into an isotopy

73 At the level of the seme, cf Rastier, 1987 a, p. 24.

74 The test of commutation necessarily involves a semantics (for many authors this aspect has remained implicit). Only a differential semantics permits a structuration of the lexicon, since it reduces its open classes to a group of closed classes.

75 A vegetable seller, from whom I asked for carrots and leeks one winter morning, responded by asking: "and the turnips ?".

named *frames* or *scenes*, even when it grants to them a cultural status--whether implicitly (cf. Fillmore) or not (cf. Schank).

(v) The concept of value breaks with the traditional conception of a natural language, and particularly of the lexicon as a nomenclature[76]. A word[77] cannot be defined in isolation, exclusively in relation to what it designates. It must be defined in relation to other words. Hence, the traditional semasiological method, which proceeds from the signifier toward the signified, loses its theoretical validity, even if it remains useful in lexicography. In lexicology, this approach is replaced by the onomasiological method that (it is generally held) proceeds from the signified or concept toward the signifier. Yet contrary to what this formulation may lead one to suppose, there is no symmetry between these two methods. It is often said that the second begins with a given concept and then seeks to identify the words that express it. The supposed concept is in fact only a generic term that lexicalizes a semantic class. In practice, the onomasiological method consists of analyzing this class[78]. And, generally, of describing lexical structures while taking values into account.

Cognitive semantics could have reaffirmed the autonomy and preeminence of the conceptual level by adopting the onomasiological method. But this wasn't the case. Instead each word remains isolated in the sign/concept/referent triad that determines its signification. One thus departs from the signifier--to which the sign is in fact reduced--in order to aim for the concept and, beyond it, the referent. This semasiological method is generally used (cf. Katz and Fodor, 1963, for *bachelor* ; Fillmore, 1982, for *write*; Lakoff, 1987, for *over)*. This method of course finds itself in trouble when confronted with the fact that the diverse signifieds of a word do not belong to the same semantic classes. For example, Langacker, in choosing the example of *ring*, finds himself obliged to interdefine signifieds belonging to different semantic classes (cf. 1986, p. 3) as the following diagram shows[79]:

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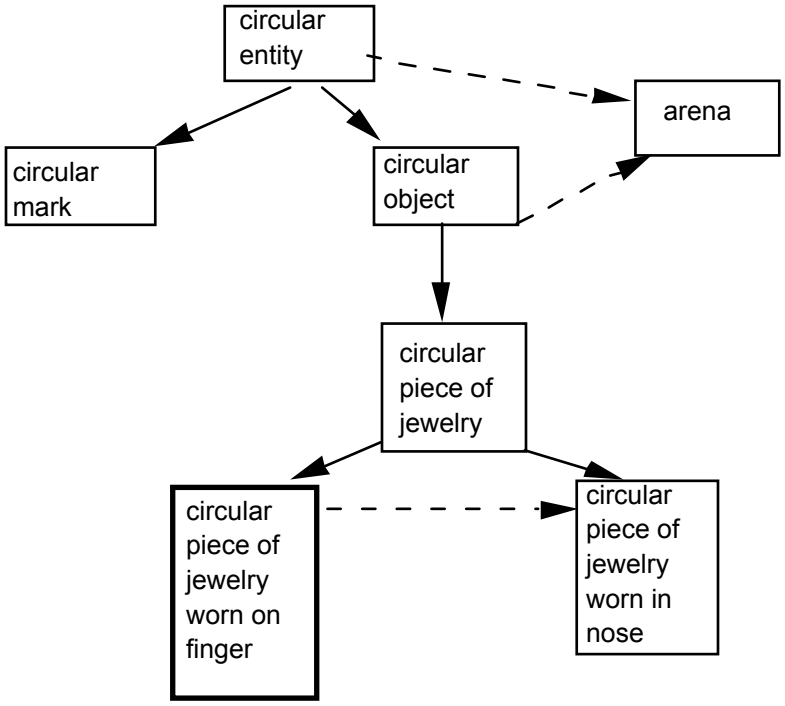
76 Cf. theories on the origin of language based on the idea of an imposition of names that one for example finds in the Greek tradition (with the onomatopoets), as well as the Judaic and Christian traditions (Adamic language).

77 I am mentioning this problematic entity in order to simplify (cf. Rastier, 1990 b) since it is around the word that the traditional philosophy of language has always hinged and this tradition continues to inspire cognitive research.

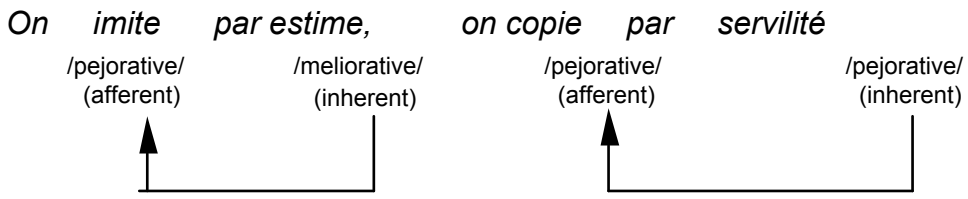
78 In French, for example, in the class of funeral monuments, "mausoleum" (*mausolée*) distinguishes itself from "memorial" (*mémorial*) by the trait /presence of the remains/.

79 This figure "describes a fragment of the network associated with the word *ring* " (*ibid*.). On the notions of prototype and category, cf. *infra*. chap. VII. Langacker does not specify the principles on which his analysis is based--an analysis that appears arbitrary in many respects. Why would "arena" be chosen as an extension of "circular entity"? Why would "circular piece of jewelry worn on finger" belong to the same schema as "circular piece of jewelry worn in nose"? Why would the second meaning be an extension of the first? Finally, it is difficult to understand why "ring" would be the prototype of "arena". And, in the end, why need one interdefine the meanings of a word given that they do not appear in the same contexts, nor do they belong to the same classes and, above all, do not have the same history? Here Langacker is repeating (all the while challenging their theory) the error of Katz and Fodor, who, in analyzing the word *bachelor*, found themselves obliged to interdefine the significations of "celibate", "young knight", "male sea lion", and "third year student".



The awkward problem (because wrongly formulated) of polysemy finds itself resolved by introducing the notion of prototype: a "meaning" would be the prototype of other meanings. The need to formulate linguistic criteria in order to discern a prototype seems excluded, since the different meanings are supposed to belong to the same conceptual sphere: "semantic structures […] are characterized relative to "cognitive domains", where a domain can be any sort of conceptualization: a perceptual experience, a concept, a conceptual complex, an elaborate knowledge system, and so forth" (Langacker, 1986, p. 4). Let us keep in mind for the moment that the considerable importance attributed to the problem of polysemy is doubtless an artefact of the traditional semasiological method adopted by various cognitive semantics.

(vi) The belief that a language is a nomenclature, together with lexicographic habits of analysis more generally, have accustomed linguists to define words independently of context. The examples of *value* given by Saussure are presented within paradigmatic classes. But the concept of value can be extended just as efficiently to syntagmatic classes that serve to define contexts. This is why we have proposed a differential semantic theory (1987 a, chap. III) that aims to develop in some ways the intuitions of the Enlightenment synonymists. Let us analyze an example given by d'Alembert:



* [One imitates out of esteem, one copies out of servility]

During the period d'Alembert wrote, neither "imitate" nor "copy" consisted of any inherent evaluative semantic markers[80], in contradistinction to "esteem" and "servility". In this specific case, the context serves to juxtapose "imitate" and "esteem" on the one hand, "copy" and 'servility" on the other, and thus permits the afference[81] of the two evaluative markers (represented by the backward arrows). The contexts thus create local classes within which the signification types are modified and, one could say, transformed into tokens[82].

More generally, the concept of value allows one to conceive of the determination of the local by the global. Saussure described this type of determination as a relation of the linguistic system to its constituent elements. It is important as well to specify that this relation is one of the text to its units (cf. Rastier, 1989 a).

(vii) Finally, the concept of *value* elicits an important question: if one acknowleges a semantic level for languages, why then dismiss *a priori* the hypothesis that this level is specific to each of them? Just as each language would have its own phonology, morphology and syntax, it would also have its own semantics. This hypothesis seems entirely admissible. In effect, the semantic level has strong links with morphology and syntax, that one knows to be specific. Moreover, lexical semantics--even the best and most thoroughly described--certainly differs from one language to another; this entails that the semantic components themselves, since they are defined by the interrelation of lexical contents, are also specific to

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80 One finds *to imitate* ("imiter") in both pejorative and meliorative contexts (ex. Fléchier: "Vous l'avez imité en son peché, imitez-le donc en sa pénitence" ['You have imitated him in his sin, now imitate him in his penitence"], *Histoire de Théodose*, IV, 7). *To copy* ("copier") can be found in meliorative contexts (ex. La Motte: "Oui, c'est être inventeur que de si bien copier" ["Yes, to copy so well is to be an inventor"],*Fables*, I, 2). But when one introduces a distinguishing mark between them, the trait /meliorative/ becomes associated to "imitate" and the trait /pejorative/ to "copy" (ex. Marmontel:"Comme les vices des Grecs avaient passé chez les Romains, Térence, pour les imiter, ne fit que copier Ménandre" ["As the Greeks' vices were passed on to the Romans, Terence, in order to imitate them, simply had to copy Menander"], *Eléments de littérature,* VI ; or Sévigné: "Il imite M. d'Agen sans le copier", ["He imitates Mr. d'Agen without copying him"], *Lettres*, 34). We will say that these evaluative markers, socially coded, are actualized by contextual cues.

81 See glossary for a definition of the term «afference».

82 The Enlightenment synonymists were not equipped to describe this phenomenon because they did not possess the distinction between type and occurrence.

particular languages. Their inventory differs from one language to another[83]. And if one admits the fundamental character of the microsemantic level, then the same will be true for the other levels.

Yet, the semantics that we have at our disposal are all general or universal semantics--of the same sort that logic, the philosophy of language or psychology have always produced[84]. In this respect, they tend to mask the diversity of languages. General semantics and language-specific semantics should go hand in hand. Better yet, it is on the basis of language-specific semantics, constructed according to common principles, that linguists could develop a general semantics that would no longer be largely speculative. It is on such a basis that one will be able to evaluate the thesis of linguistic relativism.

6. TOWARDS A UNIFIED SEMANTICS

We have presented three paradigms, the referential, the inferential and the differential; the task now at hand is to characterize these paradigms by way of contrast, that is to say, in their relations with history, sociology and epistemology.

1. References that go back very far in the past are unusual in cognitive research. In the history of ideas, taking long periods of time into consideration provides a richer source of information and features of permanence are no less significant than elements of novelty. For the journalistic and popular conception of the history of the sciences, the succession of paradigm changes and epistemological "ruptures" unfolds at a brisk pace; thus academic stars, the objects of media attention like all others, find themselves the beneficiaries of "novel" (i.e. usurped[85]) discoveries. In the domain of linguistic ideas, theories do not become outdated in the same way as is the case with the life sciences or the nature sciences…

In short, the inferential and referential paradigms have a history going back two millenia; the differential paradigm dates back two and half centuries at most. This disparity need not entail any conclusions as to their respective theoretical well-foundedness, since there are some excellent archaisms just as they are some regrettable novelties. But it is entirely normal that the relative novelty of the differential paradigm has not been understood. The criticisms of Saussure that Ogden and Richards put forth are particularly enlightening in this respect. They

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83 This point was not recognized by most of the founders of differential semantics. For example, if the French language acknowledges the opposition between the components "extra-urban" and "intra-urban"--since it permits one to distinguish between contents such as "rue", "route", "autobus" and "autocar"--one doubts whether certain Amazonian languages make the same distinctions.

84 Some of these semantics draw their examples from only a single language, yet all of them argue for a general validity and applicability to other languages.

85 What remains to be explained however, for lack of anything that one could call "new", are the "effects of novelty": one such effect having been created for example by Austin's rediscovery of speech acts, when in fact the theory of performatives (to mention only these) has a pluri-millenial tradition behind it in the domain of rhetoric (since Protagoras doubtless and surely Varron), law and theology (on the sacraments, see for example Rosier, 1990).

fault him in effect for "an inordinate respect for linguistic convention" (1923, p. 6) and conclude that "unfortunately, this theory of signs, by neglecting entirely the things for which signs stand, was from the beginning cut off from any contact with scientific methods of verification[86]" (*ibid*.). Their arguments presuppose that any theoretical proposition made in connection with a semiotic, and in particular a linguistic object, can only be verified through an examination of its referents. If we follow this line of argument, it is physics alone that would be best suited to found linguistics. This verificationism enjoys a host of solid traditions in logic[87]. And it derives ultimately from the Aristotelian conception of signification.

This appears clearly in the famous "triangle" that Ogden and Richards propose a few pages later; under the names *symbol*, *thought or reference, referent* they reassert the traditional triad[88]. They thus remain within the framework of the philosophy of language and, being unable to conceive of a linguistic semantics, they naturally turn towards logic (p. 4) and psychology (p. 8).

Ogden and Richards's work, reprinted many times, has become an authoritative reference in the Anglo Saxon world (cf. e.g. Lyons, 1980). And the referential paradigm has fared all the better since Morris founded his famous semiotic tripartition (syntax, semantics, pragmatics) on the model of the Aristotelian triad, taken up by Carnap, then Chomsky and Montague, and which provides the framework for most of the research in the language sciences. Semantics conceived on this model excludes the differential paradigm, or its adherents claim at least that such a model renders it extrenuous. Praising truth-conditional semantics Johnson-Laird for example affirms that "a theory that relates words to the world willy-nilly provides a way of relating words to each other, and renders superfluous those theories that carry out only the latter task" (1988, p. 52).

For historical reasons, some elements of which we mentioned previously, the differential paradigm was developed in Europe among the Comparativists (Hjemslev) and among the Romanists in particular (Coseriu, Baldinger, Heger, Wotjak, Schifko, Hilty, Greimas, Pottier). In the 60s, the worldwide growth of universal linguistics, and the relative decline of general and comparative linguistics,

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86 This criticism contredicts the criticism that they address to Saussure's "speculations" in asking what the object of linguistics is: "he does not ask whether it has one, he obeys blindly the primitive impulse to infer from a word some object for which it stands, and sets out to find it" (1923, p. 4). It is cleat that the authors have serious doubts about whether linguistics has an object.

87 According to Diogenes Laertius (in his presentation of the *Dialectical definitions* of Chrysippus): "When one says *it's daytime*, one appears to be considering that it's daytime. If it's actually daytime, then the assertion is true, if not it is false" (*Lives of eminent philosophers*, VII, 65).
More recently, one might also consider Tarsky's illustrious example: "*Snow is white* is true, if and only is snow is white". This conception of truth is independent of languages, and one can just as legitimately say: "*La neige est blanche* is true, if and only if snow is white". Such a conception is evidently inadequate for any linguistics that cares about differentiating languages.

88 Without mentioning it however, or perhaps because they didn't realize it given that it has become assimilated into the commonplace of notions. In the first chapter of the study entitled "Thoughts, words and things", they affirm that "we need a theory which connects words with things through the ideas, if any, which they symbolize " (1923, p. 7). They manage to introduce a novel element (refused long ago by saint Thomas of Aquinas): by tracing a dotted line from the symbol to the referent, they are obliquely admitting the possibility of direct reference, no longer mediated by thought. This idea of direct reference is what will permit a formal semantics (cf. Rastier, 1990 a).

contributed to giving credence to the idea that differential semantics was outmoded, and of continued interest only to romanists nearing the end of their careers. Yet, anyone who reflects on the Western history of linguistic ideas will recognize that the differential paradigm is the only one to have enabled the realization of a linguistic semantics independent of logic and psychology.

2. This is precisely why cognitivism, whether in its orthodox variety or not, had to ignore it[89]. On the other hand, by reason of one of these effects of novelty that the misunderstanding of history evidently favors, the referential and inferential paradigms, under the names of *truth-conditional* and *pragmatic semantics*, continued to share the problem of meaning without hindrance form third parties.

Fashion explains very little, and the more novelties are favorably greeted the more they seem to depend on secular habits of thought.

As well one has to mention a sociological factor that remains strong in the field of cognitive research and which has to do with their interdisciplinarity: the differential paradigm is closely linked to a certain form of linguistics (represented very slightly) whereas within the other disciplines (computer science, cognitive psychology) the inferential and referential paradigms predominate.

3. And yet, if one agrees that a certain "selective pressure" can do something to help different theoretical "species" evolve, then it would be a good idea to give it a chance to do so. I hope that the present study can contribute to maintaining the diversity of the paradigms.

Beyond this, we must seek to form a synthesis. This synthesis may be achieved, not in the form of a fusion of the three paradigms, but rather as an attempt to treat both inference and reference within the framework of a differential semantics[90]. A semantics unified in this way appears all the more necessary given that such a synthesis could not take place within the other paradigms. Let us briefly outline the principles of this unification.

Inference is treated at the microsemantic[91] level by the theory of afferent semes. Semantic markers are termed afferent if their actualization is the result of a contextual cue (compared to inherent markers that derive by default from a given

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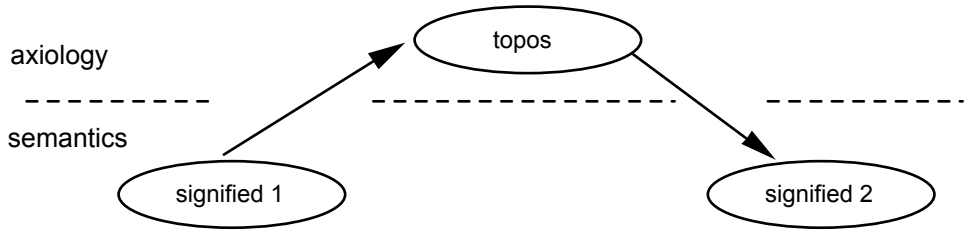
89 For example, to my knowledge the only linguist to mention Saussure is Langacker (1987, p. 11) who presents a schema inspired by Saussure. He superposes the drawing of a tree to a phonic string (*tree*). Aside the fact that the drawing reflects the well-known iconism of the Californian grammars, it suggests in classic fashion that meaning is the mental representation of an object. This model of the sign is in keeping with the triad: it relects its first stage. In parallel fashion, one could easily give a cognitivist version of Saussure, supported by, and perhaps legitimized by, his psychologism; according to Gardner, 1985, p. 199: "He considered language to be a cognitive system contained in the head of the individual speaker" !

90 For a presentation of a unified descriptive semantics, see Rastier 1990 a. Treating difference within the framework of a referential or inferential semantics hardly seems possible to the extent that differences are attached to the lexicons of languages, whereas references and inferences have been detached. In order to arrive at a unification, one would have to in turn undo the differences of languages. We have prefered instead to treat reference and inference within a linguistic framework.

91 Microsemantics describes in particular the signifieds of morphemes (sememes) and lexia (called "sémies" or *semia* in English).

type; e.g /black/ for "crow"). The interpretative procedures that identify these instructions can include all kinds of inferences, which put into play various orders of knowledge (including knowledge that belongs to disciplines other than linguistics). A schematic representation would look like this:



The arrows symbolize inferences; axioms are conventionaly represented by propositional forms (*topoï*). The validity of these propositions does not arise from semantics alone, but rather from other disciplines (that are not necessarily scientific ones).

Thus, *every occurrence is the result of a process of interpretation* (i.e by the existence of inherent markers, actualization of afferent markers). Ogden and Richards did not realize what truth lay in their criticism of Saussure, namely that "the process of interpretation is included by definition in the sign" (1923, p. 5).

Inferences also permit one to establish an inventory of units at the mesosemantic and macrosemantic[92] levels (notably in the case of ellipses, determined by catalysis in the Hjelmslevian sense), and permit the characterization of these units[93] as well (by relating them for example to universes or worlds).

Other kinds of interpretive instructions predominate these levels, in particular, generic norms. But the elementary interpretative procedures can be represented in the same way as in the preceding diagram. The theory of interpretative procedures or trajectories integrates the analysis of inferences into differential semantics. This is why we have been able to argue that an integrated pragmatics enjoys no special autonomy in comparison to a well-made semantics.

As for reference, we cannot take direct reference into consideration, since by seeking to relate expressions to objects without any mediation, it in fact denies the existence of a semantic level proper to languages. Direct reference might suit formal languages whose symbols are pure signifiers but it does not suit languages whose signs have a signification distinct from their reference; this is why they are able, through their actual use, to occasion mental representations--contrary to formal languages. In the first instance, differential semantics treats reference by describing the semantic constraints on representations. Mental images, in particular, are the psychic correlates of signifieds. Reference thus becomes a question of the constitution of referential impressions. Its study requires a collaboration between semantics and psychology. At the mesosemantic level, we

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92 These levels concern phrases and texts respectively.

93 On textuals units, see Rastier, 1989 a.

have been able to show that the different types of referential impression depend on the type of generic isotopy[94] identified in the utterance.

In a further extension, which comes under the purview of psychology exclusively and no longer of linguistics, the question of reference becomes the study of the pairing between mental representations and percepts. Just as in the case of the formation of representations, this pairing involves all sorts of cultural factors.

At present, differential semantics is open to two directions of research. Since it leads to the foundation of language-specific semantics, it finds many affinities with the hypothesis of linguistic relativism[95]. In this way, it partakes of a cultural relativism (cf. *infra*, chap. VII) and could be integrated into a semiotics of cultures. Through the study of processes of semantic differentiation, it also opens itself to the study of perception (cf. *infra*, chap. VIII), which though influenced by culture, surely implicates universal mechanisms. By way of this double opening, differential semantics offers a contribution to the fundamental and even foundational problem of the social sciences: the articulation between nature and culture.

7. EPILOGUE

How might "cognitive semantics" evolve? Or more precisely: how might cognitive theories of signification approach and possibly be accorded with linguistic semantics ? We know that orthodox cognitivism is being challenged. Might a movement take form around less dogmatic positions?

In philosophy we have seen the limits of some of Putnam's courageous contestations: they upheld the reduction of the semantic to the mental. Likewise, the virulent criticisms levied by Searle against cognitivism and AI in particular rest on axioms such as "human thoughts have mental content (semantics[96])" (1990, p. 27).

The debates engaged in by linguists are more interesting for our present purposes. They bear in fact on the nature of the conceptual level. Authors like Lakoff and Langacker no longer represent this level as a logical form but rather as a kind of abstract visual space. Thus Lakoff presents his "Spatialization of Form

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94 That is to say they depend on the type of recurrence of generic markers. For example, a phrase such as "a paved eyelid was parading presbyterially" induces no referential impression whatever since its lexemes are not indexed in the same semantic domain; the situation is altogether different in the case of a phrase such as "Salmon trout are caught with flies and a nimble cast".

95 The rudiments of differential semantics and of linguistic relativism were formulated during the eighteenth century. Both these theoretical tendencies broke with the usual dogma concerning language, and to my knowledge in an independent way, and both illustrate in their own way the principal concerns of the Enlightenment.

96 Searle comments on this axiom in the following way: "thoughts, perceptions, understandings and so forth have a mental content. By virtue of their content they can be about objects and states of affairs in the world" (*ibid.*). Semantics is thus the relation between mental contents and the corresponding objects and situations. We therefore remain within the Aristotelian triad, though deprived of its linguistic axis--already secondary.

hypothesis" (i.e. structure) which according to him involves schemas that "structure our experience of space" and he claims that "the same schemas structure concepts themselves. In fact, I maintain that image schemas define most of what we commonly mean by the term "structure" when we talk about abstract domains" (1987, p. 283). The hypothesis of the preeminence of the spatial dimension is widespread in cognitive grammars of Californian origin and points to a generalized neo-localism[97]. In these grammars, drawings have already replaced formulae (Langacker, 1987). But is this to say that geometry, and topology in particular, are going to succeed logic as a means of constructing models of the conceptual level ? The question remains open. If the nature of the conceptual level is the object of new hypotheses (which represent its constituent units as singularities seized on a continuous axis rather than as discrete atoms, and which explains its operations through mechanisms of perception rather than calculation), then the functioning of this level, insofar as it has to do with semantics, remains the same: Langacker for example affirms that cognitive grammar identifies "meaning with conceptualization (or cognitive processing) (1986, p. 2). It necessarily follows that "linguistic semantics is not an autonomous enterprise, and that a complete analysis of meaning is tantamount to a complete account of the developmental cognition[98]" (1986, pp. 4-5).

The most innovative propositions have come from research by connectionist computer scientists. This research has been synthesized by Smolensky (1988). To the symbolic paradigm developed within classical AI, Smolensky opposes a subsymbolic paradigm derived from connectionism (cf. *supra*, chap.1) for which "cognitive descriptions built up of entities that correspond to *constituents* of the symbols used in the symbolic paradigm; these fine-grained constituents could be called *subsymbols*, and they are activities of individual processing units in connectionist networks" (1988, p. 3). The resorption of the symbolic into the conceptual follows immediately: just as Smolensky names the *conceptual level* the privileged level of the symbolic paradigm, he also designates the *subsymbolic level* the privileged level of the subsymbolic paradigm (cf. *ibid*.) The subconceptual level occupies an intermediary place between the neural level and the conceptual level (cf. p. 9). Fodor and Pylyshyn (1988) might be quick to object but the fact is that this conception remains representationalist and that the symbolic units are simply represented by a large number of subsymbols.

Without entering into the debate let us note that Smolensky, like most connectionists, admits the possibility of a decomposition of meaning into micro-

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97 The localist hypothesis was developed by Wüllner and later Hjelmslev.

98 Which is to say that such an analysis is postponed: "Linguistic semantics must therefore attempt the structural analysis and explicit description of abstract entities like thoughts and concepts. […] our ultimate goal must be to characterize the types of cognitive events whose occurence constitutes a given mental experience. The remoteness of this goal is not a valid argument for denying the conceptual basis of meaning" (Langacker, 1986, p. 3). This detour, however lengthy it may be, is the result of a reduction. Of course meaning is a mental thing. But it doesn't follow from this that a science of the mind is a prerequisite or a precondition to the constitution of a semantics. The same reductive detour could just as easily be invoked by the neurosciences, since meaning has a neuronal substratum; and by physics as well (cf. Thom's semiophysics) since, in the final analysis, meaning has a physical substratum.

features which have nothing in common (despite what Fodor and Pylyshyn say) with referential markers as Katz and Fodor[99] understand them (1963). They are similar to differential markers (semes) with one distinction--and the nuance is far from slight--namely that they are not defined within the framework of a linguistic semantics[100]. The fact is exemplified by the famous discussion concerning the definition of *coffee*. To Pylyshyn who judged that the connectionist representation of *coffee* was the representation *cup with coffee* minus the representation *cup without coffee*, Smolensky retorts that "the pattern representing *coffee* in the context of *cup* is quite different from the pattern representing *coffee* in the context of *can*, *tree*, or *man* " (1988, p. 16). In short, a representation is largely influenced by its context. This common sense conclusion marks an advance over the classic paradigm. But there is still no question of signifieds: the discussion focuses on the structure of the constituants of *mental states*. If we were to admit that *coffee* is not a concept but simply the signified of the word *coffee,* then Smolensky would confirm our thesis that the occurrence of sememes are determined and formed by the context. All the more true since, after Schleiermacher, one can defend the thesis that every semantic occurence is an hapax, and the thesis can be completed by affirming that every type is really a reconstruction. Herein lies one positive outcome of differential semantics: not only do there not exist two synonymous words, but there do not exist two identical occurrences of the same word[101].

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99 Which were primitives and necessary and sufficient conditions at the same time.

100 No procedure of definition is mentioned.

101 This is why we have developed a theory of linguistic tautologies (1987 a, chap. VII) and of syllepses (cf. *infra*, chap. V).