THE END OF MENTAL LANGUAGE

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The hypothesis that thought is explanatorily prior to any spoken or written language and yet has the syntactic and semantic structure of a natural language has emerged at least twice in the history of philosophy. The best known forms of the hypothesis, that advocated by William Ockham in the fourteenth century and that advocated by Jerry Fodor in the late twentieth, have remarkable and salient similarities, similarities strong enough that it is plausible to think of Fodor's and Ockham's theories as variants of a single picture of the relation between thought and language – the Mental Language Hypothesis. The Mental Language Hypothesis in various fairly closely related forms was the dominant account of the relation between thought and language throughout the fourteenth and fifteenth centuries but by the twentieth century even the memory of it was so restricted to a handful of specialists that neither Fodor nor Chomsky were aware of its fourteenth century development.

Why did the Mental Language Hypothesis disappear, what replaced it and how did the transition come to pass? To fully answer any of these questions is beyond the scope of a single paper. My hope here can only be to make some small progress toward answers.

To make progress we must first get clear about the issues. One significant question about the nature of thought is whether thought is structured as a language is or whether it has a different structure, for example that of a sequence of pictorial images or, as in Abelard (and perhaps in Aristotle), that of a series of acts of attending to images in a variety of ways[1]. Debate about whether thought can be best understood in one of these families of ways or in the other has a long and continuing history. It is important to keep in mind, however, that the view that thought is linguistic in structure is by no means equivalent to the Mental Language Hypothesis. Many philosophers have favoured the idea that thinking is done 'in' or using spoken natural language[2]. They grant that thought

[1] Cf. Abelard *De intellectibus*.

[2] By 'natural language' I here mean languages, like French and English, and sign language counterparts like la langue des signes québécoise (LSQ) and American sign

is linguistic in structure but deny that there is any language other than public natural language – and so deny that there is mental language in the sense at issue. To count as a mental language in the sense I have in mind the system of representation in question must have several features. First it must be a medium in which thinking is carried on. Second it must have a syntax which is similar for all thinkers and which makes it possible to combine elements of thought so as to form other items which are capable of representing and of bearing truth-values. Third it must be expressively complete in the sense that anything which can be expressed in any natural language could in principle be expressed in it. Fourth it must be prior to natural language in the sense that one does not need already to have a natural language in order to have (or to acquire) it. Fifth it must be such that elements of natural languages have their meaning in virtue of relations they bear to its elements so that if its elements were to behave differently semantically the corresponding elements of each natural language would also behave differently.

Both the *oratio mentalis* of Ockham's *Summa Logicae* and Fodor's *Language of Thought* are mental languages in this sense. So, at least, are many of the rivals to and descendents of Ockham's *oratio mentalis* – the systems we find in Buridan, Heytesbury, Gregory of Rimini, Paul of Venice, Girolamo Savonarola and John Major to name just a few. It is this family of mental language hypotheses which seems to have flourished throughout the fourteenth and fifteenth centuries only to eventually disappear completely until reinvented by Fodor. The first question to be addressed here is why did this approach to the nature of thought disappear?

Before looking at the historical record let us look at the contemporary situation. Why do people now accept the language of thought hypothesis and why do people reject it?

The mental language hypothesis maintains that we have an internal (mental) medium of representation in which we can formulate sentences and frame hypotheses. The revival of the hypothesis in the 20th century is due very largely to one man, Jerry Fodor, although Wilfrid Sellars, among others, had advanced related ideas a generation earlier, the entire structuralist movement had embraced the related idea that thought itself had a deep structure, and Noam Chomsky had paved the way by arguing

language (ASL) which are made up of publicly accessible signs, are developed by communities of communicators, are learned, and can be acquired (at least by children) without formal instruction.

for the need to posit a certain amount of universal and in some sense innate grammatical structure to account for the ability children have to learn natural languages despite the poverty of the stimuli presented to them[3]. Fodor argued that a mental language is needed in order to learn anything as complex as a spoken language because learning requires representation in a medium with the resources to express what is being learned. Such a medium would have to be a language, he claimed, and would have to be capable of expressing anything a human can express. Fodor's picture gained support from several quarters. Donald Davidson, for example, had already argued strenuously that beliefs had to have a linguistic structure. Davidson, no friend of a language of thought, seemed to conclude that beliefs were sentences in ordinary spoken human languages, but if one accepted his arguments about the structure of belief and rejected his paratactic account of indirect discourse, a language of thought seemed a plausible proposal.

On the other side opposition to a language of thought has arisen from several quarters. Those influenced by Wittgenstein and Ryle find preposterous, not the idea that thought is conducted in language, but the idea that thought is prior in nature to spoken language. Focusing on the slogan that meaning is use they have thought the search for something behind spoken language to be deeply misguided. They are happy with what medieval theorists would have called mental language improperly speaking – the echoing of spoken and written language in thought. From a second quarter there has been opposition to a language of thought hypothesis from cognitive scientists. One group of these (Allan Paivio and others) have accepted the importance of a genuinely psychological (as contrasted with neuro-physiological) account of thought but concluded that at least many thoughts had to have a structure rather different from linguistic structure – had, for example, to be imagistic[4]. Another group has insisted that to understand thought we had to explain it at the level of the nervous system and that at that level there is nothing like linguistic structure – that what is found at the level of the nervous system is best thought of, say, in connectionist terms. From yet a third quarter philosophers who are or think themselves as being in an empiricist tradition

[3] J. A. Fodor, *The Language of Thought*, Cambridge, Harvard University Press, 1975. W. Sellars, "Language as Thought and as Communication", *Philosophy and Phenomenological Research* 29 (1969), p. 506-527.

[4] Cf. for example A. Paivio, *Mental Representations: a Dual Coding Approach*, Oxford (England), Oxford University Press, 1986.

have often been hostile to the language of thought hypothesis because in its Fodorian incarnation it has smacked of innatism.

Fodor has welcomed the innatism in his theory. Indeed he has argued that on pain of regress a language of thought would have to be innate because otherwise its learning would presuppose yet another language and we would have begun on an infinite regress. Innatism on such a scale has seemed unacceptable to most contemporary thinkers, however, and while few have an alternative account of how language is acquired many have been lead from rejection of strong innatism to reject the mental language hypothesis itself.

Innatism is, for the most part a feature of Fodor's particular theory and not a general feature of mental language hypotheses. Those familiar with 14th century theories of mental language will recognize a fallacy in the thought that a medium of representation must be either learned in Fodor's sense or innate. The dichotomy of a language being either innate or learned is not exhaustive, a third possibility is that the concepts which make up a language are acquired without being learned. That is the path Ockham and Buridan appear to take.

Nevertheless there are issues about innatism which the 14th century as well as the 20th century theorist of mental language must face. They come up most clearly with respect to syncategorematic terms. The mechanism employed by the likes of Ockham and Buridan for abstracting categorematic terms from the world had a structure familiar to those used to Aristotelian theories of concept formation and so could hardly have generated any special problems. But there is almost nothing in the Aristotelian tradition about the acquisition of syncategorematic concepts and, despite Hieronymous Pardo's and Prof. Panaccio's efforts I think, it is not easy to see how they could be acquired from contact with the world. The only available alternative seems to be to suppose them innate in some sense.

Why did mental language disappear? Presumably because something relevant had changed from the situation in which it first appeared so we might begin by asking why did mental language appear in the 14th century and why did it become so popular? It is a staple of the current literature on mental language that the 14th century developments have roots both in Augustine and in Aristotle and yet it is striking that neither of those thinkers nor any of their followers before the 14th century developed a picture of mental language even close to the complexity of that worked out by Ockham and his contemporaries. The emergence of the Mental Language Hypothesis at the beginning of the 14th century is almost as

surprising and little understood as its disappearance during the sixteenth and early seventeenth. In neither case do we have documents which set the Mental Language Hypothesis against its competitors and suggest why it is to be accepted or rejected. Early fourteenth century thinkers like Burley and Ockham do not argue for the Hypothesis but suggest that it is the natural way to understand such writers as Aristotle and Augustine and then go on to develop and apply it. Those sixteenth and seventeenth century thinkers who do not accept it simply ignore it and proceed as if it had never existed. There is one striking fourteenth century critique (by Hugh Lawton) which has been preserved in the work of his confrere William Crathorn, and there is one striking problem for the Hypothesis which provoked considerable discussion, the problem of how mental sentences are unified, but the discussion seems to have been largely among those who accepted the Hypothesis[5].

I suggest that whatever the immediate causes of the appearance of mental language at the beginning of the 14th century the Mental Language Hypothesis filled a recognizable intellectual need generated by the history of thinking about the nature of logic. From early in the Middle Ages there were two very different pictures of the nature of logic: on one of these (which we find for example in the *Didiscalicon* of Hugh of St. Victor) logic is a *scientia sermocinalis* – a science of language. On the other, which we find in Avicenna and particularly in the section of the *kitab al-shifa* which was translated into Latin and known as Avicenna's *Logica*, logic is presented as a *scientia rationalis* – a science of reason or of reasoning. These two pictures of the nature of logic pull in different directions and support different types of application: the picture of logic as a *scientia rationalis* supports thinking of it as a tool for detecting fallacies and makes good sense of developments like the *Ars obligatoria*. On the other hand thinking of logic as a *scientia sermocinalis* makes attention to its use as a method of generating the correct readings of sentences, understanding what a text literally says (says *ex vi terminorum*), and detecting fallacies due to language. From this perspective logic has applications in textual criticism and scriptural interpretation.

The Mental Language Hypothesis with its thesis that thought itself is a language – a mental language – which lies behind every spoken language and in several senses serves as the deep structure of spoken

[5] For Lawton's views and Crathorn's discussion of them cf. H. Gelber, "I Cannot Tell a Lie: Hugh of Lawton's Critique of Ockham on Mental Language", *Franciscan Studies* 44 (1984), p. 141-179.

languages – integrated these two approaches. Not everyone accepted this hypothesis in the form in which Ockham, Buridan and others articulated it but even many of those who did not came very close. The Dominican Vincent Ferrer for example claimed that the logician was '*artifex intellectualis*'. The mental language hypothesis provided a natural way to think about a number of the new branches of logic – exposition of terms, 'offices' of terms and the like, and these flourished throughout the 14th and 15th centuries. Thus, perhaps of some consequence in the sequel, the Mental Language Hypothesis began to play a significant role within late medieval logic.

So why did it disappear?

One hypothesis suggested by C.H. Kneepkens' terminology of the 'nominalist or more properly ultra-mentalist' approach to grammar is that mental language was so tied to a particular medieval grammatical and logical tradition, either because of some philosophical connection between the two or simply because such a connection was supposed by medieval thinkers, and that as that tradition faded from the scene in centres of learning for other reasons so did the Mental Language Hypothesis[6]. This of course invites a question about why the tradition Kneepkens has in mind faded. If that tradition was indeed internally connected with, or thought to be connected with, movements in theology or metaphysics which had independently become unfashionable that would be an explanatory step forward. With this set of issues in mind let us look at the relation between various movements in medieval grammatical and logical theory and the Mental Language Hypothesis.

Kneepkens suggests that, beginning in the second half of the 14th century there are roughly three significant schools of grammatical thought: Modist grammar, Nominalist or ultra-mentalist grammar and Humanist grammar. We can get some insight into the differences among these three by looking at their approach to a significant linguistic feature – for example, ellipsis.

Ellipsis is a linguistic phenomenon in which expressions apparently necessary for the semantic interpretation of a bit of discourse are absent from the discourse itself. For example a question like "Who is responsible for this mess?" could be truly answered by the single word "Normore". "Normore" is not a sentence so there is a puzzle about how it can be a

[6] C. H. Kneepkens, "Some Notes on the Revival of Modistic Linguistics in the Fifteenth Century: Ps-Johannes Versor and William Zenders of Weert", *in* R. L. Friedman and S. Ebbesen (eds.), *John Buridan and Beyond. Topics in the Language Sciences, 1300-1700*, Copenhagen, Royal Danish Academy of Sciences and Letters, 2004, p. 69-119.

true or correct answer to such a question. A plausible response is that the full answer to the question is "Normore is responsible for this mess" but that the information contained in the question itself – the "____ is responsible for this mess" is elided from the spoken response yet involved in the parsing of the answer and so that there is ellipsis. Mental language offers considerable scope for ellipsis and as we shall see this plays a role in determining when it is mental language with which we are dealing.

As I understand Modist grammar it sought in the first instance to give an account of the parts of speech found in spoken language and of such phenomena as government (*regimen*) and construction (*constructio*). To do this the Modist grammarian posits *modi significandi* in speech and, in some approaches at least, *modi intelligendi* in thought. These both reflect modi essendi in things. Thomas of Erfurt and Martin of Dacia are paradigmatic *modistae*.

The ultra-mentalist grammarian, as Kneepkens understands him, supposes on the other hand that each spoken sentence is correlated with a mental sentence. The mental sentence contains both categorematic and syncategorematic elements. The categorematic elements pick out or signify items that there are or could be in the world. The syncategorematic elements either modify these significations or correspond to relationships among the items signified or function as copulae or connectives[7]. Paradigmatic ultra-mentalist theorists include Ockham, Buridan, Pierre d'Ailly and John Dorp.

Why are these theorists 'ultra-mentalist' and how do they differ from the *modistae*?

Perhaps they are ultra-mentalist because they suppose that it is thought which is in the first instance expressively complete and structurally perspicuous and that the expressive powers of spoken language derive from systematic relations spoken language bears to thought. They do not suppose any isomorphism between the structure of spoken language and the structure of thought or between either of these structures and the world. At an extreme the ultra-mentalist theorist might maintain that the world just is an unordered totality of things and that the structure of spoken language is completely conventional and unrelated to the structure of thought – though I do not know any medieval theorist who went this far.

If this very broad characterisation is on the right track then we might expect *modistae* and ultra-mentalists to take very different attitudes toward

[7] Although ultra-mentalist theorists often collapse these syncategorematic functions it is far from clear that they can be so collapsed.

ellipsis. For an ultra-mentalist ellipsis could be an extremely common and normal phenomenon. For the Modist on the other hand ellipsis could not in principle be normal because that would entail that the *modi significandi* typically exhibited by expressions in speech and writing are not the normal *modi significandi* of these expressions and this seems contrary to the central methodology of the approach. If the *modistae* are right the normal structure of language must reflect the structure of the world.

Humanist grammatical theory seems to have been different again along this dimension. A theorist like Lorenzo Valla focused on a particular spoken and written language (Latin in his case), assumed that this language was expressively complete and normally perspicuous and set about to display its structure. His guides were those he understood to be the best authors writing in the language. He was particularly concerned to resist those who sought either to impose on Latin foreign (e.g. Greek) manners of speech and those who would corrupt the language by introducing obscurity of expression for philosophical ends. Thus he was harshly critical of Boethius whom he accused of introducing into Latin the participle '*ens*' and thereby wreaking much mischief. For someone like Valla a mental language would be only an irritant and ellipsis must be rare and largely decorative.

Against the background of this sketch it might be worthwhile to consider whether the assumptions needed for a mental language hypothesis depend in any way on positions distinctive of the Nominalistae or, for that matter depend on any distinctive approach to grammatical theory.

That most of the canonical nominalist thinkers of the 14th through the 16th centuries employed theories of mental language seems beyond dispute – and it is no accident. I've argued elsewhere that the hallmark of medieval nominalism is what the nominalist response to the edict of François Ier outlawing the teaching of Nominalist doctrine at the University of Paris says it is – the refusal to multiply entities along with words, or to put the matter slightly differently, the refusal to admit an isomorphism between words and the world[8]. A theory of mental language offers resources to someone with such a program because it offers an intermediary between spoken/written language and the world and because the picture of syncategorematic terms as mental acts offers an alternative to

[8] C. G. Normore, "The Tradition of Medieval Nominalism", *in* J. F. Wippel (ed.), *Studies in Medieval Philosophy*, Washington, DC, Catholic University of America Press, 1987, p. 201–217.

picturing them as signifying things or ways things are. Thus mental language theorists can maintain that the world contains (for example) only things and qualities and that nouns of spoken language which appear to refer otherwise are subordinated to complex mental expressions which only refer to substances and qualities but contain both categorematic and syncategorematic components. Thus mental language offers the nominalist more degrees of freedom. That said, it should be noted that nominalists need not use these degrees of freedom and that many have not. Abelard, for example, does not have a theory of mental language and his nominalism doesn't seem the worse for it. Both Hieronymous Pardo and Claude Panaccio present us with nominalisms which allow syncategoremata to show us not merely things but ways of things and even Ockham may be committed to something like that. On the other side there is nothing about mental language which forces one to reject an isomorphism between thought and the world. It would be perfectly open to a theorist to claim that while there was no isomorphism between spoken natural language and thought – and that ellipsis is normal – there is an isomorphism between thought and world. This seems to have been the position of Vico for example. Moreover it is just not true that mental language was the exclusive province of thinkers allied with the Nominalist label. For example John of St. Thomas too advocates a mental language – albeit one with a structure somewhat different from that which we find in Ockham.

Moreover the Modist, the ultra-mentalist and the humanist as characterised above are ideal types. Very few logicians or grammarians of the later middle ages seem to align perfectly with any of them. Consider Pardo, for example. He is usually thought of as a nominalist but in his account of language he comes very close to certain Modist positions and thereby shows how one could employ mental language in ways other than those in which Ockham and Buridan did.

For Buridan and Ockham there is a fairly sharp division between categorematic terms and *syncategoremata*. So sharp is the contrast that it suggests a recipe for an ontology – take the categorematic terms of a language or theory, eliminate those which could be defined using other categorematic terms and *syncategoremata*. The ontology of the language or theory will then be the items apparently referred to by the remaining categorematic terms. This recipe could hardly be accepted by Modist theorists who wished to include in their picture of the world not only *what* there is but also *how* it is. Pardo accommodates the Modist intuition within a mental language framework. In his picture *syncategoremata*

modifying categorematic terms pick out what the categorematic term does but pick it out in a different way – with a different *modus significandi* one might say. Pardo's *syncategoremata* are not mere mental acts but reflect the world. They are nonetheless elements in Mental language. There is thus no reason why a Modist need resist mental language as such.

If this is correct then while the Mental Language Hypothesis in some form or other certainly was (and would be) congenial to terminist grammarians and logicians it was not (and there is no internal reason why it would be) confined to them. Thus the decline of terminist logic and grammar after 1520 (itself a bit of a mystery) cannot fully account for the decline of the Mental Language Hypothesis.

What then of internal explanations for the disappearance of mental language? It has been hinted by Nuchelmans and perhaps a little more explicitly by Stephan Meier-Oeser that the decline of mental language owes at least something to a conflation of debate about mental language with debate about epistemology and in particular to a debate over the structure of mental sentences[9]. The terms of this debate are hinted at by Ockham, this story goes, but the lines are clearly drawn by Gregory of Rimini's argument that there cannot be exact analogues of spoken or written sentences in the mind because the mind has no medium like the space utilised by writers or the time utilised by speakers in which mental analogues of subjects, copulas and predicates could be displayed in a connected way. The story has it that Gregory's position more or less prevailed and that it became associated with a view which identified the proposition one judges with the judgement of that proposition. This judgement was usually thought to be one simple act and if it is conflated with the mental sentence then we lose the thought that mental sentences have explicit grammatical structure and move very close to the picture of ideas as, for example, Descartes conceives them.

Gregory's views that mental sentences are always a single act was anticipated by Ockham's view that they sometimes are. Ockham claimed that at least sometimes we formed a single mental act which was 'equivalent to' (*equivalet*) several acts – for example a single act equivalent to the two premises and the conclusion of a syllogism or a single act equivalent to the subject, predicate and copula of a sentence. Unlike Buridan, who makes it very clear that one can perform the act corresponding to

[9] S. Meier-Oeser, "Mental Language and Mental Representation in Late Scholastic Logic", *in* R. L. Friedman, and S. Ebbesen, *John Buridan and Beyond...*, p. 237-265.

the copula of a sentence only if one has already had the subject concept and the predicate concept, Ockham does not definitively settle this issue. Buridan seems to here be motivated by his compositionalism – his view that complex entities like sentences are literally built up out of simple parts. Ockham is himself a compositionalist but he does not seem to require that the composition be literal – that the parts exist separately from and prior to the whole they compose.

There is nothing in the Mental Language hypothesis as such that requires a literal compositionalism. What is required is that one be able to identify what it is about an act of conceiving an entire syllogism (say) that is equivalent to an act of conceiving the conclusion. This problem is a familiar one in late twentieth century theory as the problem of how mental language is realised in a system like the human brain which does not seem to have separate neural items corresponding to distinct mental items. There the problem has been addressed by insisting that if there is a language of thought then there will be distinguishable causal contributions made by distinct items in the language of thought. What these correspond to in the brain is an interesting question for neurophysiology but it is not a problem a Mental Language theorist need worry so long as the causal contribution of the distinct mental items can be made clear. So it is with medieval Language of Thought theory; an adherent need not claim that a mental item corresponding to a syllogism literally consists of three items into which it could, for example, be separated. What needs be claimed at most is that one can point to features of the mental item corresponding to the syllogism which it has in common with other mental items corresponding to other syllogisms with, for example, the same conclusion. These features need not be parts and could be very abstract. Thus there is nothing about the issues raised by Ockham and Gregory concerning how mental sentences are composed which should drive a theorist to the conclusion there can be no such sentences.

Moreover there is nothing about the idea that judgement is a simple act in the sense of not having other acts as literal parts which should drive one to think that judgements are not mental sentences. Of course one doesn't have to hold that judgements are mental sentences – if one already has something like a Cartesian conception of an idea as '*tamquam imago*' one can treat a judgement as such an idea with an associated act of will, for example, but there is nothing in the simplicity of judgement to militate against the Mental Language Hypothesis.

So again, why did the Mental Language hypothesis disappear? My third proposal is that it didn't, or at least that it didn't entirely but was

transformed into something different enough from both its 14th and its 20th century incarnations that Fodor, for example, did not recognise it. Chomsky noted in *Cartesian Linguistics* that the Port-Royal Grammar contains a theory of mental language. For example, Chomsky notes, the Port-Royal grammarians take a sentence like "Dieu invisible a créé le monde visible" to express three propositions 1) Dieu est invisible, 2) Dieu a créé le monde and 3) Le monde est visible. Moreover, the Port-Royal Grammarians insist that although what is expressed is one sentence, all three propositions are present in our thought. Here is Chomsky's summary of the Port-Royal view:

> A sentence has an inner mental aspect (a deep structure that conveys its meaning) and an outer, physical aspect as a sound sequence. Its surface analysis into phrases may not indicate the significant connections of the deep structure by any formal mark or by the actual arrangement of words. The deep structure is, however, represented in the mind as the physical utterance is produced. The deep structure consists of a system of propositions organised in various ways. The elementary propositions that constitute the deep structure are of the subject-predicate form, with simple subjects and predicates (i.e. categories instead of more complex phrases.) Many of these elementary objects can be independently realised as sentences. It is not true, in general, that the elementary judgements constituting the deep structure are affirmed when the sentence that underlies it is produced, explicative and determinative relatives, for example, differ in this respect. To actually produce a sentence from the deep structure that conveys the thought that it expresses, it is necessary to apply rules of transformation that rearrange, replace or delete items of the sentence. Some of these are obligatory, further ones optional[10].

Although he does not call the items in the deep structure sentences (he suggests instead that many can be independently realised as sentences) Chomsky appears to find in the Port-Royal Grammar a clear anticipation of the idea that there is a deep grammatical structure of language which is present in thought. Why then did not Fodor or any of his co-workers see themselves as heir to a specifically Mental Language tradition going back at least to Port-Royal and through it to Descartes and beyond?

Part of the answer lies, I suspect in a tension within the approach one finds in the Port-Royal texts themselves. The Port-Royal authors thought of themselves as adherents of the Way of Ideas which throughout the 17th century came increasingly to dominate philosophical thinking about thinking. On this approach Ideas are indeed '*tamquam imagines*' and thought is the having of ideas, the combination of ideas and the

[10] N. Chomsky, *Cartesian Linguistics*, New York, Harper and Row, 1966, p. 40.

passage from one Idea to another. As Descartes' characterisation suggests, ideas were modelled on images and while thinkers like Descartes took pains to distinguish ideas from images it would be fair to say that for most of those employing the language of ideas thought was quasi-pictorial. This strand in the Port-Royal texts seems at variance with the current which Chomsky finds there and so it is perhaps, little wonder that Fodor and other recent mental language theorists did not see themselves in a tradition going back to Port-Royal.

There is one source of opposition to theories of Mental Language to which I have so far paid little attention. Humanist theorists of various sorts were inclined to emphasise the particularity of language and to resist efforts to assimilate the structure of one language to that of another. They thus had practical reasons to dispense with mental language. But there is also a more direct way in which Humanism challenged the picture of a mental language. It is due, at least in part, to Petrus Ramus.

Gabriel Nuchelmans pointed out as early as 1979 that Ramus "conceived the syllogism as a form of computation"[11]. It was, moreover, a computation performed not on sentences but on terms. This approach to logic was taken up, notably by Hobbes, and Hobbes seems to have had a direct influence on Leibniz (who cites him in *De Arte Combinatoria*). We find echoes of it as late as Augustus De Morgan's suggestion that the syllogism is a theory of transitive and symmetric relations.

The idea that reasoning is a computation with terms emerges easily from reflection on Aristotelian syllogistic but it stands in stark contrast to the idea that reasoning is fundamentally the construction and manipulation of sentences. For Ramus, and, it seems for Hobbes, spoken language was not fundamentally a means of declaring the sentences one had conceived and neither of them thought the structure of language to be modelled on that of thought. Hobbes, indeed seems to have considered spoken language to be one of the major forces shaping thought – though not giving it an essentially linguistic structure.

The idea that thought is computation which we find in Ramus, Hobbes, Leibniz and certain aspects of the Port-Royal Logic sits uneasily with the doctrine pretty well explicit in the Port-Royal Grammar that what the mind has as deep structure for *parole* is a set of propositions. So, Twentieth century mental language theorists are likely to see these as two completely different levels of description of a process. We have

[11] G. Nuchelmans, *Late-scholastic and Humanist Theories of the Proposition*, Amsterdam, North-Holland, 1980.

become accustomed to the thought that the brain may be something like a computer which at the level of hardware contains nothing but circuits, switches and gates and which runs at different levels software which is structurally very different from the hardware itself. Fodor, for example, does not imagine that the brain itself is organised like a language. What he does imagine is that there is an analogue of software and an analogue of running such that we can say the brain is analogously running a mental language. But theorists from the 17th through the 19th centuries did not, as far as I know, consider the possibility of such different levels of description. Thus for them the thought that the mind computes when it thinks would have been in inevitable tension with the thought that it processes language. And, as the history of logic from Leibniz to Boole and beyond shows, there were real advantages to be gained from thinking of the mind as a computing device. So one possibility which I advance very tentatively is that mental language disappeared in the competition between the picture of the mind as a grammatical engine and the picture of it as a computer the latter temporarily gained the upper hand. To tell why the model of the mind as computing device did temporarily gain the upper hand would, I think be in part to tell the story of what ideas were conceived to be – but that is quite another story.

Why then did the Mental Language Hypothesis disappear in the sixteenth and seventeenth centuries? There is not, I suggest, a single reason. It was in many minds closely associated with the Terminist logic and open to the same scorn. It ill-fitted most of the other grammatical movements of the time. It sat uneasily with the new emphasis we find in Valla and others on the grammars of particular languages. It was in tension with the New Way of Ideas. Finally, and perhaps most decisively, it seemed in tension with a growing emphasis on thought as computation. If this is correct it is perhaps not surprising that it was not until the second half of the twentieth century that we find the Mental Language Hypothesis revived because only then did we find again conditions ripe for its revival: emphasis on the logical analysis of the structure of natural language sentences, the revival of interest in universal grammar, the forging of close connections between logic and grammar, widespread conviction that pictorial theories of mental representation were inadequate and finally, in the development of the computer analogy, a model of how computational and linguistic structures could be copresent in the same device. Whether these conditions are here to stay remains to be seen!

QUAND LE LANGAGE A-T-IL CESSÉ D'ÊTRE MENTAL ? REMARQUES SUR LES SOURCES SCOLASTIQUES DE BOLZANO

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L'extrusion des propositions mentales

Les historiens récents de la philosophie analytique ont souvent jugé révolutionnaire le geste de Bernard Bolzano (1781-1848) consistant à faire sortir les propositions – les *Sätze* – non seulement du règne du langage parlé, mais aussi du langage mental, pour les établir dans un domaine qualifié « d'en-soi », les *Sätze an sich*. Bolzano aurait ainsi jeté les bases de ce qui allait devenir, *pace* Frege, Meinong et Husserl, une grande partie de la philosophie dite analytique. « L'extrusion des pensées de l'esprit a été initiée par Bolzano »[1], affirme par exemple Michael Dummett dans son ouvrage sur les *Origines de la philosophie analytique*. Il complète cette affirmation en précisant « qu'une fois accompli le premier pas de Bolzano et poursuivi par Frege, Meinong et Husserl, qui a permis de retirer les pensées du monde intérieur de l'expérience mentale, le second pas consistant à les considérer comme générées par le langage et non comme simplement transmises était virtuellement inévitable »[2]. Toujours selon Dummett, cette décision bolzanienne s'est faite au prix d'un platonisme abusif, mais aura permis de liquider le « psychologisme » dans lequel aurait noyé la tradition occidentale. Cette décision philosophique a dans un premier temps beaucoup fasciné : dans le monde anglo-saxon, elle a inspiré tous les partisans de la philosophie du langage commun, et en France, elle a fasciné tous ceux qui, portés par la vague structuraliste, voulaient abolir le rôle constitutif de la subjectivité ou de la conscience dans la constitution du monde. Pour Bolzano, ce n'est pas l'inconscient qui est structuré comme un langage, mais le monde lui-même. La tâche de la logique exposée dans la *Wissenschaftslehre* (1837)

[1] M. Dummett, *The Origins of Analytical Philosophy*, Londres, Duckworth, 1993, p. 130.
[2] *Ibid.*, p. 29.