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The Mosaic of Language

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In a previous book (Chapouthier, 2001), one of the authors developed a thesis describing living beings by using the metaphor of the mosaic. A mosaic, as a work of art, is a representation, either figurative or abstract, and the perception of the total image as a whole is the result of the juxtaposition of small coloured elements, and their subsequent integration when perceived visually, but with the small units maintaining their individual status and characteristics of colour and shape. In a more philosophical sense, the term « mosaic » can, in general, be applied to any structure where the overall properties of the whole do not destroy the autonomy of the properties of the component parts. This philosophical approach will be used to apply the concept of the mosaic structure to language.

A brief review will first show how the mosaic metaphor can provide an adequate description of living beings, covering anatomy and certain essential functions. Secondly, we shall present arguments showing the relevance and usefulness of this same model for linguistics.

1. Living Beings : Mosaic Systems

Mosaic structures can be observed in living organisms and at every level of the structure, as defined above, i.e. structures where the properties of the whole do not cancel out the autonomy of the component parts.

Complex mammalian genes are comprised of silent introns (with no immediate biological activity) and exons actively involved in cell metabolism, i.e. the life of the cell. The integrated structures (the genes) concede a degree of autonomy to their component parts (the exons and introns). In fact, modern theoreticians in the field of evolution (Ohno, 1970) claim that identical silent introns were produced through juxtaposition (referred to as « duplication ») during geological periods, and then differentiated through mutation, integrating their role and appearing as groups of active exons involved in producing new organs and new biological systems.

In animal anatomy, each level of organisation can be considered as a mosaic, with a large degree of autonomy at the lower levels (Chapouthier, 2001, 2003). A cell can thus be seen as a mosaic of organites, an organ as a mosaic of cells, an organism as a mosaic of organs, where each imparts its respective share of determinism to the parts and to the whole. Similarly, organised societies, e.g. bees and primates, are mosaics of individuals that maintain their autonomy (and in human societies, this autonomy means freedom) ; but at the same time they support the overall functioning of society. In a simple pattern, the living world is a set of mosaics on different scales and levels.

We have shown that similar mosaic structures can be used to describe two of the most complex constructions in the living world : *the anatomy of the human brain* and *human thought* ; (the philosophical brain-mind question will not be debated here). The human encephalon is comprised of different parts, basically five, each retaining specific functional features, while also contributing to the harmonious functioning of the whole. The same applies to the large number of areas comprising the cerebral cortex (visual and auditory areas, plus areas devoted to the understanding of oral language, oral expression, reading and writing etc.). The same organisation is found in the two cerebral hemispheres (the difference being that the mosaic has only two pieces). In all cases, the functioning of the whole allows for a large degree of autonomy in the functioning of the component parts.

As was previously shown (Chapouthier, 2001), two essential components of thought can be seen as mosaic structures : consciousness and memory. Contrary to our own personal impressions, *consciousness* is both the whole and the combined component parts. The parts

can be separated, e.g. in pathological conditions affecting humans where the two hemispheres are disconnected. In these subjects, known as « split-brain », two consciousnesses prevail in one brain. More common phenomena, such as dream states, can also produce another form of consciousness that can coexist with what appears to be a single consciousness. In *memory*, a patchwork of highly contrasting mnemonic capacities can be seen ; this is the heritage acquired via our animal ancestors in the course of evolution, through habituation, conditioning, spatial memory, cognitive memory and so on. All these abilities play a role in the whole that we call « memory », while retaining the features specific to their own functioning.

How did these mosaics emerge ? In general, through the repeated application of the two main principles observed throughout the evolution of the species : first *juxtaposition* of identical entities, without any interaction occurring (introns, cells, parts of organisms, organisms etc.), then *integration* of these entities, leading onto the construction of systems where the entities, once simply juxtaposed, reach a level of interaction. In the most complex systems, such as consciousness or memory, it is always difficult to detect the juxtaposition stage which is so obvious in the analysis of simple systems (Chapouthier, 2001). The separate parts of consciousness and memory are not easy to distinguish, as their functions can be seen as strongly integrated mosaics.

2. Application to Language

A person pronouncing or reading a sentence, pronounces or reads the different semantic units in order ; these are seen here as the « parts ». The overall meaning of the message emerges gradually and may undergo some reversal of the meaning when new units are included. Thus the « whole », i.e. the overall meaning of the message, appears as a mosaic of its parts, the successive linguistic units, but these still maintain a certain degree of semantic autonomy when considered individually.

Language in operation can be seen as displaying the dual characteristics of mosaics : the juxtaposition and then integration of its parts to produce a higher level of complexity.

2.1. Formal Juxtaposition and Linearity in Language

Language is made of discrete units forming the parts of the utterance. Here we are only referring to higher level units, i.e. lexical and grammatical morphemes, for while we may also see mosaics of phonemes : phonemes are integrated into higher level units to produce morphemes. Language in operation involves formal juxtaposition of units to build an utterance, and the juxtaposition is both linear and sequential. In speech, the chain of units is produced over time, never concurrently, and while written language has parts coexisting in space, the links are still sequential. A number of poets, for example Apollinaire in his *Calligrammes*, have used spatial effects to surmount the constraints of linearity, but even then, from a functional point of view, the organisation of the units comprising the sentences remains sequential.

During the gradual unfolding of the utterance, these parts, while formally juxtaposed, undergo constant processes of integration into the overall meaning of the utterance ; and these processes are formal (e.g. the construction of the syntactic relations within the utterance) and mostly semantic. The integration of the parts produces a higher level of complexity which is the meaning of the utterance. The units comprising the utterance are the building blocks that form the utterance, but they maintain a certain degree of autonomy, firstly because they exist independently of their use in the utterance, as individual parts with their own values, and secondly because the meaning of the whole utterance cannot be reduced to the sum of the meaning of the component parts. For example, in French, the positioning of an adjective before the noun in *un bel imbecile* (a fine idiot) can change the meaning of the adjective : the expression *un bel imbecile* does not refer to a person who is both stupid and handsome. The same holds true for the compound nouns : their overall meaning can not be reduced to the sum of their parts ; for instance a *pomme-de-terre* (a potatoe, lit. « an apple-of-the earth ») is not a variety of apple (see Corbin (1992) on compositional morphology).

This is because specific integration processes operate within the utterance. In language, as is the case with other mosaic structures, the integration of the parts at a higher level is achieved through the specialization of each part with specific functions, as in the example cited where the units in the utterance have played specific syntactic roles.

2.2. The Integration Process at Work in Language

What are the relationships between the parts and the whole in language ? How are the units integrated into the utterance ? We will briefly review the main mechanisms at work in the construction of meaningful utterances ; these mechanisms are familiar to linguists but need to be considered from an external point of view to see how the parts of a given mosaic are integrated as a whole. The most important phenomenon of integration in language relies in the integration of units in a predicative structure where they acquire syntactic functions and are used to build up an assertion. Moreover, we have observed two interesting features characterizing this construction : first, due to the polysemy of languages, the linguistic units present a potential semantic overload which will be reduced as the utterance is constructed ; and secondly, the utterance level has structural features that shape the meaning in non-linear ways. The overall meaning of a sentence is built through different non-linear processes operating at the level of the utterance, gradually specifying the meaning of the utterance and stabilizing the meaning of the separate units. Only the main processes are reported here (for further details, see *inter alia*, Robert, 1997, 2003 and in press).

First there is the initial semantic overload of the units. In isolation, language units are polysemous, this being a widespread phenomenon in languages, and a facility for optimizing a system as a minimal number of units can refer to a maximum number of entities. Units with only one meaning are extremely rare, even in everyday life ; for example, the French word *chapeau* refers to a hat but also means the introductory paragraph of an article ; *règle* is a rule, an instrument for drawing lines, but it also means a rule or regulation ; *baignoire* is a bathtub, but also denotes a private box in a theatre. A fine analysis by Corbin & Temple (1994) cites the case of « *un bleu* » (blue one) which can mean a bruise, blue cheese, dungarees or even a new recruit : all these entities have, in different ways, the common property of « being blue ». A linguistic unit thus offers access to a network of referential values that are related in one way or another. The present study will not investigate the way the different meanings of a given term are related (mostly by metaphor, metonymy and schematization).

We will only mention that this network of relationships is a complex and multidimensional structure where the paradigmatic relationships between words and phrases contribute to create the various meanings and help build multiple relationships between words and their different meanings ; e.g. the colour paradigm in French politics : a *blanc* (white) being a royalist, a *bleu* (blue) a republican, a *rouge* (red) a communist, and a *vert* (green) an ecologist, yet the red-white distinction is totally different when referring to wine. The initial polysemy of a given unit is a specific property of that unit, but disappears once it is integrated into an utterance.

Using words in an utterance sets up a contextual linkage, creating in turn a frame of reference within which the potential semantic overload of the units can be dealt with. This linkage activates one or another of the latent values for the given term and reduces its initial polysemy. Thus an utterance is formed gradually, with the meaning of the units becoming more specific and therefore the information still to be given becomes more predictable thanks to a mechanism of « anchoring » : the development of the meaning of an utterance emerges from a series of connections between the different component parts ; this is the common, basic mechanism of « anchoring » (Culioli 1990, 1999). Anchoring is an elementary, asymmetrical operation that links two elements : one element (the locator) acts as an anchoring point to locate (in an abstract sense) the second meaning (the located). This operation helps specify the meaning of the units affecting different structural levels and elements of a different nature. Each anchoring relationship helps specify the meaning of the related elements and build up the meaning of the utterance.

All factors, whether contextual, lexical or grammatical, have a role to play in gradually building up the meaning of the utterance and specifying the significance of the terms. When a unit is part of an utterance, it is simultaneously linked (or related) to elements that are anchoring points at different levels, i.e. a previous verbal or situational context, other lexical elements and syntactic structures. Language is nothing more than relationships and the mechanisms establishing the relationships produce meaning through the constant interaction of the related elements. When a word is used in an utterance, it activates one of the latent values of the term and produces a contextual linkage, clearing a path through the thick forest of meaning. Speech does not trigger all the possible meanings of a given term ; sometimes the context is so specific that the standard meaning of a term is not necessarily the most likely.

When speaking, the situation (i.e. the broad verbal and situational context) provides the basic anchoring point or locator and the first factor specifying the meaning of the units located. Depending on whether a French-speaking person is buying bread or a musical instrument, the word *flûte* will immediately be linked to the semantic domain of the situation, denoting either a small loaf of crusty bread or musical instrument. The speech situation operates as the default « meaning attractor » providing the field of reference for the terms used. The situational context may also introduce variations to the meaning of the grammatical units, completely changing the overall meaning of the utterance : for example, the grammatical meaning of *vous* (you) in the question *Je vous coupe la tête ?* will mean to cut the head off a fish « for you » (benefactive) when at the fishmonger's, and will mean to « cut your head off » (attributive) if threatened by a person wielding an axe.

Starting from the cardinal anchoring point set by the speech situation, various relationships are established within the utterance and then help specify the meaning of the words and gradually build up the meaning of the utterance. All the elements — contextual, lexical and grammatical — are involved in establishing the relationships between the parts of the sentence ; for example, the verbal context will help specify the meaning of the terms by defining the semantic field relevant to the subsequent units. The word *monture* — (1) a mount, and (2) a frame — will change according to the subject being discussed, i.e. horse-riding or eye-glasses. The link to the verbal context can then restructure entire groups of units : when discussing architecture or days off work, the whole predicative relation of the expression « *il a fait le pont* » will change : the architect has literally « made the bridge », while the figurative meaning applies to a person who has taken days off work between a weekend and a public holiday.

The role of syntactic relations in the construction of the meaning of a statement has been clearly established : the position and organisational rules governing a given language determine the syntactic role of the different terms in the statement. But these syntactic rules also help stipulate the specific meaning of the terms. One example can show how word order plays an initial role in specifying the meaning of the units, and that is the contrast in French between *un homme grand* (where the adjective placed after the noun denotes a physically tall man) and *un grand homme* (where the adjective before the noun expresses a judgement : a great man). The position of the adjective in French has semantic force, producing shifts in meaning.

The relationship between one unit and another can also help specify the meaning ; e.g. the noun *tuyau* (a pipe or tube), when used in the expression *filer un tuyau*, is meaningless if understood literally, but makes sense in the figurative expression *filer un tuyau* which means to give a tip or convey information. The context does more than just filter semantic values, it creates its own semantic values through interaction. The word *tendre* (tender) changes meaning depending on whether it refers to a person or a steak. The phrase *White House decisions*, establishes a relationship between the *White House* and an action requiring a metonymic interpretation of the words white and house (the site denoting the institution on the site). Such relationships can have retroactive effects.

One interesting example in French is the term *gueule de loup*, literally the « wolf's mouth » ; but if the adjective « wilted » is used – *gueule de loup fanée* – the adjective retroactively changes the expression from a possessive into a compound noun denoting a flower, a snapdragon. In the same way, the meaning of metaphoric expressions emerges through a reanalysis of the phrase triggered by the contextual linkage. For instance, the same phrase *to kick the bucket* has a different meaning according to the context in which it is used : it can mean « to bowl over the bucket » (literal meaning) or « to die », metaphoric reading in which the overall meaning is not compositional and the integration is more drastic. The same holds true for grammatical constructions. In a sentence like *the magician touched the child with the wand*, the syntactic attachment of the complement clause « with the wand » to the noun « child », or to the predicate « touched », as well as the instrumental vs associative meaning of the preposition « with », can only be specified by the semantic and pragmatic context in which this sentence is used.

This relationship between the terms of an utterance are regulated by a basic mechanism known as the « semantic isotopic » (Greimas, 1966 ; Rastier 1987) whereby the meaning of a term is linked to the semantic field established by what precedes it, developing a guiding

thread for the meaning to be understood. For this reason, the prototype meaning of *chapeau* (hat), which is in common usage, is not the meaning applying in an example cited by Victorri (1997) which is a minor usage where the word *chapeau* denotes a brief heading text introducing an article.

Integration processes operate constantly throughout an utterance and gradually make the end more and more predictable. Through contextual linkage, linguistic communication is such that the information to follow becomes increasingly predictable, but this predictability is never absolute.

First, the main thread can always be broken. Unexpected information introduced at the end of an utterance can thus have a surprise effect : the impact of the information is stronger precisely because it is unexpected in relation to the accumulated specifications of the contextual linkage. One example is the advertisement for « Dim » hosiery : *en avril ne te découvre pas d'un Dim*, based on an alliterative French proverb warning against the sudden return of cold weather in springtime, *en avril ne te découvre pas d'un fil* (in April, don't remove a stitch (of clothing)). This sort of reversal of the information curve is a key element of rhetoric, and also of advertising, as B.-N. Grunig (1990), who cited this example, has shown. Many advertising slogans have an impact by using an unexpected term with high informational value and a clash effect when included in a familiar expression. The end of the utterance is therefore the focal point for what has been called « semantic bombs » ; these do not have simply cumulative effects as they induce restructuring, resonance, diffusion and stratification of the meaning (Robert 2003).

These non-linear effects are related to structural factors, to the existence of utterance-modifying units and to the permanent establishing of relationships within the utterance which makes it possible to have a retroactive effect that can sometimes be quite acrobatic. Utterance-modifying units (« enunciative morphemes ») have semantic scope that goes beyond their syntactic role : their meaning affects the entire utterance and not just the term to which they are bound by grammar, e.g. the use of negation, the adverbs *probably* and *fortunately* or the adjective *admirable*.

Thus, in French *Jean est admirable de travailler ainsi* (John is wonderful to work so (hard)), more idiomatically expressed as « it's wonderful of John to work so (hard) », the adjective *admirable* modifies the syntactic subject *Jean*, but it also expresses a judgment on the part of the agent of the speech act (i.e. the speaker or « enunciator ») concerning the predicative relationship <*Jean, travailler*> as a whole. Intonation also introduces radical semantic changes quite disproportionate to the formal impact, as it can transform a statement into a question or an exclamation and totally change the meaning.

Until the utterance is complete, it is always possible to produce retroactive effects and changes in meaning. A slogan used by a French service station offers an example : *Vous pouvez tous crever... Le garage X vous regonflera*, playing on the double meaning of *crever*, either to get a flat tire or to die, and the double meaning of *regonfler*, to re-inflate or to give someone a new lease on life.

Poetry sometimes works on restructuring produced through new relationships established through the different linkages. The haiku quoted here, by Jean Monod (cited in Antonini, 2003), is one example :

L'absente de tout
bouquet la voilà me dit
en se montrant l'aube.

The three verses of the haiku are parts of the poem, even though each of the three could be broken down in turn and seen as whole units, divided into simpler semantic components. In the first verse, the feminine form *absente de tout*, makes the reader think of a woman who is absent ; in the second verse, the reference is a bunch of flowers, *bouquet*, and as the flower, *fleur*, is feminine in French, the reader then thinks that the *absente* must be a flower ; but then the third verse gives the full meaning as the absent figure is the dawn, *aube*, another feminine noun. The dawn does not destroy the autonomy and poetic elements of the preceding references : the dawn can also retain the image of the flower and of the woman. Here is a fine mosaic and this haiku is a fine expression, in language, of the dialectic between the whole and the component parts — the same mosaic observed with the anatomy and functioning of living beings.

3. A Parallel with Living Organisms

The parallel seen with the structures of living organisms could be pursued by postulating that, in the case of language and of living organisms, there is a preliminary stage where the units are juxtaposed. This hypothesis was proposed by Talmy Givón (1998) who made the distinction between « grammatical » and « pre-grammatical » communication. According to Givón, language offers two means of communication that can be seen as the counterparts of the two stages of phylogenesis, but they are also involved in certain specific linguistic situations, and with reverse importance are involved in normal communication. The first means of communication, and which is of interest here, is the pre-grammatical process thought to exist before the emergence of the grammatical mode of language ; it appears at a certain stage in language acquisition, and is seen with agrammatical aphasic subjects and in « Pidgin » speech, i.e. when two communities speaking different languages develop a language for basic communication designed to meet minimal communication requirements. This channel of communication has no grammatical morphemes ; the syntax is simple, operating through juxtaposition ; the word order is pragmatic (and not syntactic) and there are many pauses. Because there is no grammar, no explicit relationships operate between the different elements of the lexicon ; it could be compared to speech by young children, e.g. *Granny... cat... garden*. The similarities between Pidgin, the utterances of agrammatical subjects and a child's speech are quite striking ; it is simply juxtaposition of units for pragmatic effects. As a means of communication, it is slow and analytical, requiring considerable cognitive input and featuring a high error rate because the nature of the linkages and the function of the units comprising the utterance are not coded : it is clearly a stage of simple juxtaposition. Givón sets this against the grammatical mode which is made possible by using the structure of languages with proper grammatical morphology and complex syntactic constructions, and where the word order relates to syntactic functions. This type of communication, which we see as the mosaic stage, is swift, economical and automated, but is only acquired after a considerable period of time.

4. Conclusion

A great deal is yet to be learnt on the origin of such a complex function as human speech. There are many sources, both biological and cultural, and the present paper has endeavoured to cast light on what could be an intrinsically biological facet of the origin of language.

The theory we have put forth is that living beings are mosaics at different stages, that they have a mosaic structure with highly diverse levels of organisation, ranging from genes or cells to the anatomy of the encephalon and even the organisation of key mental functions, such as consciousness and memory. In the present paper we have found that this mosaic structure is also apparent in language when analysed.

When compared with the workings of living organisms, language presents quite striking similarities with the other processes at work in living organisms.

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