

Language and Communication among Hominids

Guy Jucquois

Introduction

The question of the origin of 'natural' human language has fascinated the scientific world for a very long time and seems to be generating a renewed level of interest. But because, as the paleoanthropologist Henry de Lumley has expressed it, 'language does not fossilize' one is reduced to exploring a combination of interpretations. Authorities differ markedly over the period when language emerged in respect of the aspects which they retain as being significant or not, but also in relation to the base positions from which they address the issue.

For some, language, at least in its earliest forms, is likely to have appeared as far back as *Homo habilis*. Others place its emergence later, but most certainly attribute language to *Homo erectus*. Another group assesses that language appeared only with the first manifestations of *Homo sapiens*, while yet others reserve this phenomenon as an exclusive characteristic of modern humans, for whom it is the source of their originality and predominance. In reality, the chronology of the emergence of language depends for a large part on what is meant by 'language' and on the modes by which it functions, for another significant part of the ways vestiges of fossil humans are interpreted (in terms of their associated artisanal industries and the lifestyles these traces suggest, and so on), and for a final part, but an aspect which it is important not to obscure, on the positions of the researcher in terms of his or her conceptual ideology and the ideology that was dominant at certain places and periods. Finally, account must be taken of the part played by all these elements in combination in the determination of when and how language appeared.

If one limits oneself to biological consideration of the origins of human language, one can look to what the organic vocal structures apparently tell us. In this case, one must look for indications of how well developed were the organs associated with language production as it has been experienced by human beings of the historical period (development of the neo-cortex and the mouth and pharyngeal cavities). This seems a more secure approach, but observably there are authors apparently opposed

Copyright © ICPHS 2007

SAGE: Los Angeles, London, New Delhi and Singapore, <http://dio.sagepub.com>

DOI: 10.1177/0392192107078774

to it, such as Dean, who recently claimed that at least the rudiments of an articulated language must have been present in *Homo habilis*, a theory previously developed notably by Yves Coppens. Lieberman, on the other hand, considered that, at the other end of the evolutionary scale, *Homo sapiens neanderthalensis*, in contrast to *Homo sapiens sapiens*, would not have possessed more than a strictly limited form of articulate language, a position still adopted today by different authors who often associate it with linguistic monogenism. Research based essentially on the organic substructures of human language risks therefore limiting investigation to language forms that are close to those of modern humans, and thus minimizing the sociological and anthropological aspects of the phenomenon.

In contrast, if one addresses the problem of human language origins by taking as a point of departure the progressive growth in social and technological complexity such as can be reconstructed for the prehistoric period, the logical conclusion to be drawn is the consideration that, at least from the time of *Homo erectus* onward, a certain form of articulated language existed. From this perspective, the biological aspects are of only secondary interest, linked essentially to the concrete modalities associated with the functioning of natural human languages. What seems to be admitted by all researchers is that with *Homo sapiens* one must recognize the presence of a fully developed language capacity, for certain among the *sapiens* and also in all likelihood among the Neanderthals. Up to this point all authors are in agreement. It will be noted here that this agreement arises from the fact that authoritative opinion attributes the remarkable development of modern Man precisely to the social interactions that language permitted, in other words to socio-cultural considerations in the broad sense of the term. It is difficult to determine whether the apparent absence of change in ways of living over extremely long periods is solely due to an effect of perspective giving a distancing impression over time together with an apparent lack of points of comparison, or, on the other hand, if this was in fact very much the reality.

It is, moreover, principally in relation to language and to its significant role in the social, cultural and mental life of humans that controversies have multiplied over the question of whether or not *neanderthalensis* constitutes a distinct species from *sapiens*. Should *Homo sapiens* be subdivided into two varieties of a single species, *Homo sapiens sapiens* and *Homo sapiens neanderthalensis*, which implies the capability of interbreeding, or rather considered as two distinct species, hence without that capability? Of course, if it is postulated that functional human language such as we know it in the historic period demands the acquisition of the physiological properties found in present-day humans, and if one accepts that the paleolaryngological analyses have relevance in this regard, then it follows that, as Lieberman assessed, oral language would only have appeared with *sapiens sapiens*.

The presuppositions associated with this assertion can carry with them a 'rupturist' or creationist perspective, which leads on to situating the emergence of modern Man at a point of biological and civilizational mutation, justifying the 'abrupt' appearance of human language. So presented, the thesis of a sudden appearance of fully constituted language is the expression, in a specific domain, of a creationism which some would wish to accredit, a vision also apparently manifest in the monogenism of the original ancestral couple and in a universal brotherhood of man, a notion moreover that is proposed more as a religious principle than as a premise for

the generous sharing of resources. But if only a single species is involved, and furthermore if it is accepted that there has been hybridization between the varieties of *sapiens*, then the whole reasoning and approach of Lieberman collapses. On the other hand, if language began with modern Man, one might hope to be able to reconstruct by the application of linguistic methods a so-called 'proto-world' language, as Ruhlen and others after him do. This presupposes, however, that one should be able to explain the 'chronological gap' of several tens of thousands of years which exists between the point at which paleolinguistics can reconstruct the potential for language and the first evidence for the presence of modern humans. If language extends back to more remote eras, paleolinguistic reconstruction becomes totally fanciful, unless one takes into account solely certain deep-seated elements that are by nature tenuous and few in number, one overlooks chance associations which are all the more numerous for starting out from phonological inventories of limited scope and loose precision, one ignores comparisons arising from grammar (morphology and syntax), one is not too demanding on the level of semantic linkages, in sum if one situates the reconstruction in the periods which preceded the acquisition of the specific characteristics of natural human languages.

In a more general sense and on a strictly methodological level, as Alain Gallay observed, the interpretation of complex phenomena is of necessity dependent on an *a posteriori* history. We probably have to give up the idea of a scientific and universal 'explanation' of the essential phenomena of prehistory, be it the appearance of agriculture or the beginnings of urban settlement and, clearly, the emergence of natural human language. Faced with the previously unsuspected complexity of each of these phenomena, the researcher is reduced to doing little more than sketching out certain paths. Since the 1960s, in particular following the publication of André Leroi-Gourhan's book *Le geste et la parole* [Gesture and Speech], one had become accustomed to a very systematic and structuralist perspective of prehistoric processes. It has been realized since, however, that such developments are not necessarily linear and structured. But the difficulty, already intrinsically large, is not isolated. This suggests that one should address the tricky question of the origin of natural human languages by attempting to define them on the communicational and socio-cultural plane and by trying to situate within a time scale the appearance of retained characteristics.

Historical characteristics of natural human languages

On the level of functionalities, the generally accepted classification was that proposed from 1934 on by Bühler and subsequently refined by various authors. Under this classification, language rises through four distinct functional stages, starting out from an *expressive function* (transmissive or not), then a *signalling function* (effective or not), followed by a *descriptive function* (true or false), finally arriving at a *function of constructive argument* (relevant or not). Let's look at these four functions in a little more detail: in the expressive or symptomatic function, the animal expresses an emotional state or feeling (cries, chuckles, calls, etc.); in the signalling function, the signaller seeks to provoke a response from the receiver (the repertoire of such signals

is huge, as the science of animal behaviour shows, especially among social animals); the descriptive function supposes a capacity for situational assessment and hence one of interpretation and ordering of reality; as for the argumentative function, it is grounded in the interiorization of a structured set of linguistic and social rules which allow for the construction of reasoned and convincing arguments.

Authorities generally agree that only the last two functions apply specifically to humans. It is no doubt very difficult to establish the earliest phases of the essential process of symbolization, which cannot be dissociated from the apparently parallel development, but one which is also tricky retrospectively and externally to demonstrate, of consciousness and, even more so, from the emergence of that consciousness. To judge from the way in which these processes become established in modern human beings and especially by the way in which symbolization functions in present-day societies, it is highly probable that consciousness only developed from the third stage on and did not fully bloom until the fourth stage was reached. It will be noted furthermore, and this is something that would subsequently be shown to be essential, that there is no need for the development of a syntax at the first two levels, but that this becomes indispensable at the two later levels. Indeed, on the descriptive and argumentative functional levels, structural links are established between objects and these are expressed by syntactic links, however rudimentary, between lexemes. The step to the third and fourth functions thus requires the addition of a syntactic component. And for such there is a double role: on the one hand it orders the relationship between the terms (its syntagmatic function), but furthermore, and so that this first function can be performed, it imposes a lexicological categorization (its paradigmatic function). The accession of a language to a syntactic dimension implies that, through the process of lexical categorization, the nature of the lexical elements becomes defined.

Thenceforth, the two processes of syntactification and categorization which of necessity transformed language, required the transition to a structure of double articulation. In its turn, this latter change facilitated the more extensive structuration of language, a phenomenon which then allowed for the almost indefinite expansion of the lexicon and progressive complexification of utterances. It was essentially in the transition between the second and third language functions that the doubly articulated structure must have appeared, permitting the further evolution of a language until then limited to lists of terms towards the first forms of language that allowed the elaboration of connected discourse. Following slightly different paths, Andrew Carstairs-McCarthy reached identical conclusions by laying down as characteristics of natural human language the expansion of the lexicon, double articulation and syntactification. On the level of functional language, nothing presently allows the third and fourth phases to be separately distinguished in human prehistory apart from a few neurological and anatomical elements, however much one may wish to accord these a significance tending in that direction. On the other hand, the extent of organization required on the functional language level for passing from functional stage two to the following stages suggests correlative modifications in the areas of political and social organization of prehistoric communities. We will return to this aspect later. Meanwhile, the introduction of a structuring process to the set of language elements which previously did not have such permitted an expansion in

the number of signals and their spread into lexicons whose components became hierarchically ordered. This effectively bore witness to the earliest elements of a structuration of language and the beginnings of syntax.

It can well be appreciated that the four functions are not situated at the same level of development. In particular, the function of constructive argument, added by Popper, seems to come only in last place. This aspect is confirmed on the level of ontogenesis as on that of phylogenesis, resulting naturally from the fact that this function is particularly complex and strongly linked to the presence of rationality (structured thought capable of looking ahead). In language acquisition among human beings, it is observed that children develop according to the same process of moving from the first function to the fourth, with each function presuming the prior acquisition of the previous one. In the child, language development also goes hand in hand with affective and social development. From the time that the descriptive and argumentative stages have been reached, there exists the possibility of choosing between the 'true' and the 'false', which brings with it the potential to tell the truth but also to tell untruths, to convince or win over others, to anticipate things, to act and to order life circumstances through speech. In the prehistoric period, the emergence of a structured language seemingly coincided with the appearance of new forms of social and political life. In other terms, the conception and expression of a system of regulated exchanges within a human community must have occurred simultaneously for the three types of exchange that Lévi-Straussian anthropology projects as invariant. That gives grounds for the existence of three corresponding codes regulating these three types of exchange, the grammatical code, the juridical code and the moral code.

Attempts have been made to try to understand the social behaviours of prehistoric humans on the basis of those observed in present-day societies whose ways of life may have presented analogies with those of our far-off ancestors. In relation to the use of 'pebble caches', efforts have equally been made to find a model which would allow the understanding of the social structure of early hominids by drawing upon the social structures of present-day human groups, but taking inspiration also from observing the habits of contemporary chimpanzees. In default of being able to directly and plausibly reconstruct the social life of *Homo habilis*, observations are proposed of purportedly more or less parallel situations, be they of human communities which, for various reasons, may have retained certain very ancient characteristics, or else of groups of chimpanzees, because of their being our closest relations in nature.

Quite simply it comes down, as Gallay recalled, to taking note of the convergences between what we know of the Olduvan mode of life and those of modern-day chimpanzees, of bringing together what we can learn from chimpanzee behaviour along with what might be legitimately extrapolated about the earliest hominids. For some, this drawing of parallels seems if not more so then at least as plausible as that which is frequently proposed between early hominids and present-day hunter-gatherer societies. Certainly, the patient observation of chimpanzees carried out in their natural environment allows instructive parallels to be conceived with the evidence provided by prehistoric archaeology, just as the attempts to inculcate in chimpanzees various forms of language can show up fundamental similarities and divergences between our far-off cousins and ourselves.

Grammar and conceptualization among chimpanzees

There have been various well-known attempts to teach forms of language to captive chimpanzees, all of which have been based on natural human languages. The progressive process by which the chimpanzees acquired language skills allows for a better understanding of how socialization factors in hominids have contributed to the emergence of human language and also for a better measure of the relative importance of the various language components. Indeed, studies of animal languages show a progressiveness in language skill acquisition which correlates to the degree of evolution of the species: the ability to establish functional classes and relational distinctions seems to have begun with the primates and to have become an inherent skill with the evolution of the higher apes. These latter appear to have certain dispositions towards different types of representations, but this aptitude is only weakly developed. Its actuation depends on the surrounding conditions. It is easily conceivable that certain 'latent potentialities' might not in fact develop except in particular conditions of the natural and social environment. It could well be that such conditions pertained during the transition from *Australopithecus* to *Homo habilis*; in any event they must have intervened decisively at some stage during the long history of this latter species.

Although conducted in an artificial environment, the comparison of language capabilities in man and in chimpanzees points up certain interesting characteristics. On several occasions attempts have been made to teach a language to different species of animals, and in particular to chimpanzees. The attempts were directed as well towards recognition of sound forms (Hayes and Kellogg), with admittedly meagre results, then trials were carried out with signs or with symbolic objects. A young female chimpanzee assimilated through these a vocabulary of 130 signs, which she learned equally to combine within phrases of up to four signs in length. As a consequence it might be asserted that for this animal an embryonic form of syntax was developing. However, it was noticed that the order in which the four elements were placed did not seem to have particular significance in the sentences formed by the chimpanzees. In contrast, right from the first stage of vocalization, the child will assign a value to the elementary syntactic constructions he/she makes use of. In addition, among chimpanzees, the content of the sentences relates almost exclusively to requests for food or attention. Furthermore, questions have been raised on just how significant the size of the chimpanzee lexicon is, because it appears to reach an upper limit among these animals whereas the reverse is the case in man.

But it was noticed that the number of lexemes was not in itself a sufficient criterion. No doubt, as suggested above, it is also necessary to include some rules of structuring, which themselves are linked to how large the lexicon is. This aspect may well allow a glimpse of the way in which language progressively developed in complexity. The origin of the double articulation could well go hand in hand with the emergence of the first elements of a syntax, just as – and we discuss this later – the appearance of writing could well have accompanied the fundamental alteration of socio-political relations within human communities. On the double articulation level, that would not have been anything extraordinary since double articulation can

equally be analysed as resulting from the introduction of structuring rules within an inventory of forms which previously did not possess any, with the utterance or 'text', which is the most complex form of this process, being only ever the regulated combination of paradigmatic and of syntagmatic elements. No doubt the evolution towards a doubly articulated system of language was progressive among hominids, with the intensification of social links within human communities simultaneously stimulating the development of the social and mental dimensions along with the language instrument. Noteworthy in this context is the development of the mathetic, or learning, function of language in children who ask questions in order to understand, something that chimpanzees almost never do; this is a characteristic which highlights the role of dialogue and more generally of social interaction in the acquisition of language skills. The development of the language instrument both allows and demands this social dimension, but this links back, in man, also to certain particular developments of the human brain.

The experiments undertaken by the Premacks to teach an artificial language to chimpanzees have brought out both the ability of chimps to acquire such languages, but at the same time their inability to learn syntactic *distinctions*. This aspect was demonstrated by the comparison with human utterances produced by children of between 2½ and 3 years of age, which is the precise moment when they begin to learn the rules of syntax. It has been observed that children of that age were able to produce simple utterances of the type 'Daddy come home' or 'where Mummy gone?', but equally they could produce utterances of the same type minus the subject, as in the examples 'come home' or 'where gone?' The omission strategy concerns only the subject, which suggests that children of that age have the ability to isolate a subject function. Nothing similar can be observed among chimpanzees whose elementary syntactic linkages remain stereotyped.

Another difference resides in what the Premacks call 'linguistic spontaneity', which shows up in dual fashion: first of all the ability of a human language user to produce and to correctly understand utterances that she or he has never met before, the evidence of which has been clearly established, notably by Noam Chomsky; but along with that goes the ability to paraphrase an utterance, to accompany and support it with gestures and mimicry, to express oneself by utterances whose meaning is implied rather than stated openly, and so on. Chimpanzees nonetheless are capable of expressing themselves by adapting the order of words to their intentions, and thereby to distinguish, say, 'Mary give Sarah ice-cream' from 'Sarah give Mary ice-cream'. They are also able to learn certain lexical substitutions and even to perceive where the meanings remain the same between sentences that are nevertheless differently structured.

The experimental teaching of an artificial human language to chimpanzees brought to light for the experimenters an element which proved essential, but which had nearly gone unnoticed. It so happened that the Premacks observed that as chimpanzees learned a language, that process progressively modified the nature of their responses, which were initially purely perceptual but which gradually became more conceptual. Now, conceptual judgements are generally considered to belong exclusively to the human species. In the particular experiment the task was to associate, for example, a three-quarters-full glass tube presented as the template

against three-quarters of an apple or half an apple. Selecting the three-quarter apple depended on an analogical calculation. The outcome was that, for a same-age category, the ability to choose correctly showed up as acquired only by young chimpanzees which had learned to communicate through language exclusively of others. But against that it would seem that the variables of age and intelligence level had no incidence on the outcomes of the experiment, and that the only significant aspect was the development of a process of symbolization through the supplementary socialization brought about by the acquisition of a language.

Through the language learning, the animal came to be able to represent the information to itself. But it was observed that such conceptualization progressively inhibited the purely perceptual responses. So, from this research it may be concluded that primates have little difficulty in grouping together things which have physical similarities. For example, a red apple is placed in clear view, while below it are randomly scattered another apple, a shoe, a banana and a red patch. In experiments with children and chimpanzees, both will first choose the apple (association of identity), then the red patch (association by aspect), then the banana (association by category) and finally the shoe (no particular association). With older subjects, but also with the acquisition of language, the identity association is passed over in favour of the aspectual association, which suggests the acquisition of a capacity for abstraction. Thus, both the child and the chimpanzee introduce through their practice of a structured language a hierarchization of communicative functions. It may be noticed that this parallels the hierarchization of language functions as set out earlier.

Communicative need and animal behaviour

Animal behaviours associated with communication remind us that communication is not a luxury but in many cases a condition of survival. It has thus been observed that most species have been impelled to develop and improve means of better reacting to the signs made by their fellow members or to the signals emitted by their environment. With natural selection giving reinforcement to those individuals best adapted on the communicational level, certain species over the course of evolution have established communication systems built out of diverse sets of signs. Among these latter, because of their particular role but also their complexity, a special place must be reserved for gestures and for vocal signs. In relation to other within-species communication systems brought to light by animal behavioural studies, those based on hearing and seeing allow for the optimal sending and receiving of messages in the conditions required by communities that are constructed from a complex set of relationships. Paleontology and neurology emphasize furthermore how in the course of evolution information exchange loops are progressively established between the regions of the brain specializing in hearing and vision, and how in human beings links are also established with the zones associated with language.

Thanks to our growing understanding of how the brain functions, we are able to advance a little way in the understanding of how human language appeared and of the links that had to be established between brain functioning and the various

manifestations of language. Let's start with perceptual recollections which are facilitated and made immediately available by representations in symbolic form: we as human beings have access to repertoires that we call 'words', which are labels that are attached to objects. As such word-sets become more complex, which is a progressive phenomenon linked both to the number of distinct 'words' they contain as well as to the associations which may become established between these, such repertoires can come to be structured according to various rules and hierarchies. They thus allow an order to be established in the surrounding world, in us and between the members of a same community. Through the acquisition of these 'words' and of the representations that are associated with them, an acquisition which is achieved through concrete situations of learning and intercommunication, the individual becomes socialized and also learns the social codes particular to his/her community of belonging.

Today medical imaging allows us to distinguish the regions of the brain which are activated according to whatever function is solicited. Thus, when we read a word but think of it just as a simple language component, or conversely when it sets off a recollection of the concepts it represents, or further when someone is asked to break down the word into its component syllables, or else if they are asked to think about the meaning of this same word, on each occasion it is observed that different parts of the brain become active. All of which is a clear indication that there is a specialization of the regions of the brain according to which linguistic tasks are required to be performed. We cannot therefore simply transpose back into prehistory what we know about the differentiated functioning of the brain according to the linguistic tasks performed by present-day humans. To the contrary, brain neurology is strengthening the hypothesis of a very close correlation, gradually built up over the course of the process of hominization, between the progressive development of the neurological zones linked to language and the development of a hierarchization of social relationships and of a nexus of symbolism which have become reflected in the evolution of language.

Progressive or sudden emergence of human language

According to what we have seen, all the characteristic features of hominids argue for a progressive appearance of language among them. There is general agreement furthermore in recognizing that the emergence of a consciousness and to a large extent the complexification of social life within human communities were conditioned by this appearance. Language thus constitutes the most central and the most undeniable of the features that characterize humans. That is why research into the conditions by which it appeared equates to a certain extent to identifying the key moments in the process towards hominization. But the overall progressiveness of the emergence of the language phenomenon does not for all that imply that this evolution must be considered to have been even and continuous. Depending on which points in the process are observed or which periods are taken into account, one may gain the impression of a very slow pattern of change or, on the contrary, of an accelerated evolution, even of abrupt changes or of mutations. But where we may

perceive an accelerated evolutionary rhythm, care must be taken to distinguish what might be only a perceptual effect linked to the insufficiency of our knowledge from, on the other hand, definite periods of evolutionary acceleration.

Over the very long period throughout which humans have evolved, one can distinguish two phases, characterized by their variation in evolutionary rhythm. For in fact this latter has been of dual nature: very rapid at first and up until the appearance of anatomically modern humans, then almost imperceptible ever since. From the emergence of *Homo sapiens* onwards, biological evolution, notably in relation to the growth of brain size, seems minimal or non-existent. But inversely, during this same period, cultural evolution seems to have accelerated. These two phenomena are no doubt not solely the result of an effect of perspective. If we consider them simultaneously, it is difficult not to characterize the stage reached at the intersection between the previous period and the period in which *Homo sapiens* appeared other than as a major event on the evolutionary level, but also as an event which has left few significant traces on the level of physical anthropology. This event, or better no doubt this set of events, includes for certain the rapid acquisition of a form of language that comprised the essential features of all human languages.

If we take the supposition that effectively human language such as we know it, whether considered on the descriptive level of its double articulation and the structural organization of its elements at all language levels, or considered in terms of its mental, social and political functionalities, came into existence at the same time as *Homo sapiens*, that obviously does not exclude the possibility that it was preceded by various more archaic forms of language. On the contrary, everything points to a progressive emergence of this feature, even if the arrival of the *Sapiens* caused a radical acceleration in the rate of its evolution. Viewed from this perspective, the question arises of deciding how the earliest forms of *human language* should be characterized. The gradual nature of language evolution clearly does not exclude a very long duration (from the time of *Homo habilis*, or at least from *Homo erectus*), with the progressive emergence of aspects which would facilitate the later construction, with *Homo sapiens*, of fully constituted human languages. Nor does such evolutionary gradualness exclude comparable elements, but equally fundamental divergences, with the forms of language developed by other species of the higher primates. Inversely, to attribute the sudden appearance of human language to a mutation associated with the beginnings of *Sapiens* effectively links this phenomenon, as we have seen, to particular modes of representation of the nature and functions of human language. These representations rest inevitably on the notion of language as a vocal manifestation and on the notion of double articulation. It is worth recalling that the transposition from first-level to second-level articulation did not necessarily occur in an abrupt manner and that the vocal aspect is but one of the features that make up natural human language.

One can conceive without difficulty how a language could pass from the stage of gesture and mimicry to a voiced language. Over the history of research into language origins, that is decidedly the kind of evolution that many authors have imagined. Most researchers in fact seem to have no difficulty in accepting that, among even the very earliest of our ancestors, visual signs, mimics and cries could have existed which corresponded to representations that had a collective relevance within a

community and which constituted the prototypes of the more sophisticated communication systems that evolved among hominids. In respect of this hypothesis, the difficulty resides in the process by which this type of language, to all appearances rather poor in scope, could develop towards the elaborate forms of language such as are apparent in all human communities today. Whatever the case may be, present-day authors tend to privilege the mimicry function as the characteristic element of the initial phase of the language acquisition process. In some ways it could be considered a pre-adaptation to natural language. At the second acquisition phase that Donald proposes on the basis of neuropsychological criteria, a new stage of language development would have appeared. Donald allows a sequential development of firstly 'lexical' growth followed by phonological organization and finally the appearance of a rudimentary 'syntax'. To us it seems preferable on the other hand to consider that these three components all emerged progressively and simultaneously. Indeed, significant lexical growth cannot be conceived without a systematic phonological arrangement, and even more so without the imposition of a certain phonological ordering over what would up till then have simply been an open-ended phonetic inventory, and its transformation into a closed and hierarchically arranged system.

The progressive transposition towards double articulation

Comparative analysis of the various known forms of communication in use in the animal world underlines the uniqueness of human language. In the quite different context of descriptive linguistics, an essential element towards a solution of the theory of the origin of human language was constructed by André Martinet with the notion of double articulation. A few technical explanations are probably useful at this point. We know that, whatever the language we are considering, it is based necessarily on 'lexical' elements, which, at the first two stages of development may be little more than cries, laughs or diverse noises, but which then pass on to become signals intended to attract the attention of fellow members of the species. If the constitution of these initial 'lexical' entities does not allow for the incorporation of other elements, few in number and in themselves non-signifying in function, but which may be used to constitute new combinations, the 'lexicon' will remain limited, whether in the number of its elements or of its 'words', since each item would need recourse to a different element. So, with the 26 letters of its alphabet, the French (or English) language can create a vast quantity of different words. But this also supposes that each letter taken singly may not signify anything. Let's try and see how the notion of double articulation might allow an advance. First of all it is a matter of checking to see if this aspect is in fact a part and characteristic of natural human language and then to establish how it could have become progressively formed or, on the other hand, whether it could have only appeared in sudden and abrupt fashion.

Among all the characteristics mentioned, double articulation appears to constitute the one *essential* and *specific* feature of natural human language. From 1969, Georges Mounin, revisiting this linguistic property put forward by Martinet, had strongly

emphasized how double articulation allowed a radical distinction to be made between the natural human languages and all other forms of language. Contrary to the descriptive theory and to current opinion of the time, double articulation did not first and foremost relate to the vocal articulatory nature of human language, but to its form of construction separately located on two hierarchically ordered and doubly structured levels. The first form of articulation determined the existence of minimal segments of signification (the 'monemes'), the second the existence of minimal segments of distinction (the 'phonemes'). Up to the present time, among all communicative systems, only natural human languages have shown this important feature, which there is therefore reason to consider as a specific characteristic of these latter. One might then wonder when and how it appeared. Indeed, if its appearance could be isolated in time and space, this would constitute the veritable birth certificate of natural human language. But before we look for this putative 'date of origin', if of course it ever really existed other than in our imaginations and our fantasies, it is clearly important that we better understand how this feature, claimed to be unique and determinant, actually functions.

In little more than a single page of introduction to a recent book and from within a perspective which is that of one group of present-day researchers, André Langaney encapsulates the whole question of the appearance of natural human language. For this investigator, the problem of the origin of human language appears fundamental for understanding the process of hominization. There is nothing revolutionary in that perspective. On the other hand, according to the group of researchers of which he is a part (and this is new), the question of human language origin may very likely be linked to the explanation of the present-day diversity of human cultures and languages. The systematic Lamarckian transmission of cultures and technologies would have very rapidly demanded recourse to a language. Langaney insistently reminds his readers that for him the matter of human language emergence would not have been a process of memorization to retain a vocabulary which the great apes, for example, have shown themselves capable of memorizing and using with intentional effect, nor a consequence of the anatomy of the sound-generative system, since many other transmission systems could also be imagined. Langaney, following on from linguists who support the notion of linguistic monogenism, thus postulates a sudden and abrupt appearance of human language, which would have been marked by the sudden presence of a marker element, particular to the type of communication characteristic of human communities.

So, it is its double articulation that finally seems to be the one feature which allows a radical opposition to be established between human communication and the collective set of animal communication systems. That is why Langaney reasserts that the central element of the thinking process remains the double articulation, whose origin is still a mystery but whose appearance is generally supposed to have been sudden. So, asks Langaney, was double articulation the result of a neurological 'mutation', to human invention or to both at once? This apparently technical question would appear to be without great interest for pre-historians. However, in consideration of an abrupt appearance of the double articulation characteristic, how can this be reconciled with the other elements which seem to be associated with it and with the concept, supported by many other indicators, of a progressive emergence of

different constituent features of human language? The difficulty with the rupturist concepts lies in the fact that the totality of the aspects known about language emergence reinforces the progressive character of language acquisition, especially if language is considered as being associated with all the characteristic progressive features of hominization. In summary, then, the centrality of double articulation in the functioning of human language would suggest that it should be retained as the key element in all attempts to understand the emergence process, but the aspects that point in favour of the progressive appearance of language clearly contradict a definite position relating to sudden emergence, since the descriptive theory of linguistics habitually presents double articulation as a non-evolutionary feature.

Let's try to get out of this difficulty by further deepening the central notion of double articulation. Classically, from the traditional theories of linguistics to the most recent versions of generative and transformational grammar, distinctions have been made in the analysis of human language between several different levels: firstly a lexical level, then a grammatical level and finally a semantic level. It might be noted in passing that these might broadly be said to correspond to the three major paleontological phases in the constitution of human languages and to the first three language functions described earlier. The third of these functions, that of description, analysis, interpretation and structuring of reality, demands the functioning of the lexical and grammatical levels and the progressive development of the semantic level. Finally, the fourth function enables expression of a metalinguistic nature; it allows for self-reflection and is linked to the emergence of 'consciousness of consciousness'. If one supposes that dual articulation was a progressive acquisition, marked by the stages reiterated above, one may then observe an overall concordance between the successive phases and those proposed by the neuropsychological approach to hominization, with its phases of pre-adaptation to language.

Social complexification and systems of representation

Renewed consideration has been given elsewhere to the anthropological and politico-philosophical information able to be drawn from the history of systems of notation and of writing systems. Let us simply note that the historical evolution of writing provides a very illuminating parallel, and one which is no doubt more than just a simple comparison, for understanding the progressive development towards the double articulation process. As we know, representation of things through drawings was the origin of what are called pictograms. At the purely drawing stage, you need to have as many different representations as there are things to be represented. Acting like points of fixation, such drawings are still nothing more than mnemonic devices permitting the recall of spoken messages. But such representations nevertheless tend to become rapidly uniform and stylized: from that point on the sketches no longer represent this particular horse or that particular person, but gradually become an abstraction, representing 'the horse' or 'the person' in general. The drawing has become a pictogram. Stylization thus allows for the insertion of these pictograms into structured series and thereby reaches the level of representations that are recognized collectively and where these are correctly inter-

preted. The stylization process has two essential consequences: it inscribes the representation within a determined culture which at the same time it contributes towards constructing, and it places a limit on the inventory of signs that are accepted and understood within a community. Expressed in another way, in a particular time and place and for a specific human community, stylization of figurative representation establishes correspondences between realities, signs and representations.

As societies became more complex and through the usage itself of the system of representation, the function of pictograms came to be extended. The gap between the signs used and what they represented also grew larger. The stage was reached of what can already be described as ideographic writing. In such writing, each word, each 'idea' is figured by a sign which replaces it. The outlines of the signs still bear traces of their origins and of their evolution. Abstract notions start to be expressed by intensifying the principle at work since the beginning of 'putting a sign in the place of a reality', except that henceforth one can also place a sign referring to a reality to denote another reality. This is what is called the rebus principle. From this point on it becomes possible to replace a particular sound sequence by a particular written sequence, and to do that *independently* from the representations that were initially evoked and which are possibly still evoked by the signs employed. The languages of the three communities where writing was invented around five thousand years ago, in China, Sumer and ancient Egypt, all share the characteristic of having many monosyllabic words. Under these circumstances, the application of the rebus principle in each of the three languages, but with down-stream outcomes which were quite different in each case, led to the creation of syllabic signs which, much later, gave birth to whole syllabaries and eventually to alphabets. Among the latter, all contact has been lost with the initial realities represented by each sign: no one thinks any longer, and few in fact realize, that the letters of the alphabet derive from very ancient Near-Eastern Semitic ideograms whose original meanings were rapidly lost.

Some time during the second millennium BCE¹ in the Semitic Near-East, a number of tentative forms of partially alphabetic writing developed, on the basis of stylized elements no doubt derived from several concurrently existing writing systems whose graphic forms were also quite close to each other. To judge by this parallelism of letter formation, a process of double conjuncture could well have been happening at the same time. First a conjuncture of forms – certain signs are clearly identical and stylized in the same manner – but especially a common invention of a new mode of representation, even if the base forms might be divergent. The alphabetic writing of Ras Shamra is of a quite different graphology from the other forms of writing of alphabetic type dating from the same era, but the principle that underlies the invention is identical in all the examples, which all come furthermore from one and the same geographical and cultural zone.

The broad directions followed by the history of writing forms thus assist in the understanding of how the passage from a system of single-level articulation to one of double articulation can happen gradually or through the sequence of several 'mutations', provided that these are of limited breadth. From this observation drawn from the history of writing systems flows the idea that the elaboration of a doubly articulated language system did not in all likelihood come about suddenly, but

rather that it is probably necessary to postulate a very long evolutionary process for a language to pass from simple articulation to double articulation. This is an essential evolution because it allows the hominid to progress beyond the stage of an analogical world in which things in the real world correspond potentially to linguistic representations of themselves. These figure in inventories whose elements are of necessity very limited in number, even if these elements are inscribed in structures that are themselves relatively simple.

The progressive movement towards double articulation facilitates the indefinite growth of lexical elements and the constitution of rules of grammar, consequently allowing for a more and more complex and abstract understanding of the world, that is, one that is detached from the purely concrete aspects of reality, and hence the corresponding production of more and more complex utterances. The process of passing progressively to double articulation correlatively enables the passage to a digital world. On this level, three new types of relationships ensue for human beings: first between the two types of brain (human and electronic), second in the interpretation of the world by humankind and our action upon it, and finally in the relationships of human beings with each other. The potential for man to act upon the world in effect comes about through the ability to produce tools and use instruments: throwing a stone, shaping a flint tool, acquiring and retaining a mastery over fire, etc. But, beyond very simple operations, the possibility of achieving the desired effect demands the memorization of a process and the anticipation of the sought-after result.

These operations progressively require the existence of a language which will permit them to take place and facilitate their functioning. Little by little, that leads man to fashion the environment according to what the latter expects of him. Human beings can manufacture weapons for use against threatening wild beasts and stock their larder from the prey that they hunt. The animal fur with which they protect themselves against the cold is already virtually present in their hunting plans before it is worn on their backs. Collectively shared forms of representation allow the insertion of the individual into the plans of those who participate in the same representational system. This demands the socialization of each individual so that each might acquire the group usages, but it also safeguards a personal aspect which corresponds to the specificity of each individual. In other words the appearance of the I occurs concomitantly with the appearance of the Other through the ever more efficient applications of a language within a given socio-historical context. The insertion of a language into a specific historical and geographical context gives eventual power to progressively escape from the immediacy of constraints.

Thus, the acquisition of a structured language, such as appeared during the historic era among human beings, arises out of potentialities established during the course of evolution. These potentialities are distinct from general intelligence, and they blossom in the child when, at the appropriate age, it becomes engaged with the use of a human language. Two pathological conditions, in some sense the one the opposite of the other, enable us to achieve a better understanding of the close links between language, social identity and individuality. On the one hand, among certain individuals, the *instrument* of communication that human language constitutes is hypertrophied, while among others in contrast it is hypotrophied or even atrophied.

The extreme forms of these disorders constitute in fact neuropsychiatric pathologies. In those afflicted with Williams syndrome, despite levels of intuition and empathy that are often remarkable, the language instrument is hypertrophied. It allows an abundant production of perfectly constructed utterances, but which are almost devoid of all content. Characterized by a non-stop flow of words, taking delight in talking, often in a very expressive manner, people manifesting this communication disorder never get past the level of the anecdote, with language becoming for them an end in itself.

At the opposite pole, so to speak, are those suffering from autism. Under this one term there is a tendency to group quite different sets of individuals, who have in common only their inaptitude for communication and for being able to share with others their feelings, beliefs and knowledge. Autistic people have difficulty grasping the idea that others also have powers of thought which are particular to them, but among this group the pathology can extend from doing nothing but constantly repeating unusual bodily movements to leading an apparently normal life both professionally and within a family, but which apparently goes along with a profound inability to understand others. Through the deficiencies signalled by these two types of pathology, the essential role of communication through language in human beings is very strongly emphasized. Over the course of the process of hominization, specific communicational skills appear to have progressively developed among hominids. Thanks to various evolutionary changes and pre-adaptations, the language abilities emergent at each stage of development allowed them to respond to the needs for communication among communities where social pressures and mental needs demanded the constant adaptation of an instrument for facilitating exchanges.

Rules of exchange and articulated language

It has been pointed out how much the gradual growth in complexity of human communities over the course of prehistory had required the progressive introduction of rules, notably those of language. But from the inverse point of view, the existence of an articulated language is essential for establishing the rules, for soothing tensions and for resolving conflicts with the group. In this sense, the rules governing how words are exchanged must be of a power of the same order as the rules regulating the exchange of goods or women. Now the power of a language depends on the combination of two factors which come together in the production and comprehension of utterances. The first of these factors relates to the extent and precision of the lexical resource, whereas the second encompasses the development of an appropriately adapted syntax. There are some types of codes whose elements may be grouped in any sequence at all and still be meaningful (as the decimal number code is). But codes of this type do not permit the elaboration of complex expressions. In language exchanges within a community, the judicious combination of lexical elements and syntactic elements is what produces a grammatically correct and semantically acceptable utterance. The development of the syntagmatic component is thus all the more essential as the lexicon becomes extended and as the meanings of utterances

need to become more and more precise. It has been observed that these two conditions are closely associated with the development and complexity of the society.

The science of animal behaviour indirectly provides some interesting suggestions about the advent of human language and lends strong support to a gradualist conception of the process. To understand this latter, in relation to what he termed 'the prevention of incest', Boris Cyrulnik put forward some extremely interesting remarks, for they emphasize the close links that must have presided over the elaboration of the rules governing languages and societies. It is his considered view in fact that human beings must have been governed by a form of order before they had the capacity to give spoken or verbal representation to this reality. This ordering process was expressed in the life of the collectivity and in the rules which applied to it. Cyrulnik situates this set of rules in an affective structure by which, for example, the choice of mates would be organized and which, before even the incest prohibition could be formulated in words, was already imposing it. A similar affective structure, which did not solely determine the prohibition of incest but the whole body of socially governed behaviours, would gradually have come to be put in place within the world of human life. For Cyrulnik, the foundations of human emotions are to be found on the one hand in the perceptions which established the *representation of the individual*, and on the other hand in the feelings brought on by *representations of the collectivity*.

Indeed, observation of different animal species has enabled it to be established that the weaving of relations of attachment induces in animals so related a sentiment that prevents them from coupling sexually amongst each other. This sense of attachment can come to bear on different objects, so in migratory birds there has been observed an attachment for the particular place to which it returns each year to mate and which is also the place where it was born. Naturally the most important attachments are those that link individuals within the pair bond, within a family or a social group. In the relationships between individuals, the attachments allow the communication of emotions and the attenuation of aggression. They tend to become inscribed as part of more complex rituals which facilitate the resolution of the happenings of daily life.

What is significant in this explanation is to note the existence of a biological underpinning well grounded in the long chain of evolution and which shows how memory functions to facilitate relational attachments and sense representations. These are what Cyrulnik pertinently calls the 'behavioural premises which prepare the way for the sign'. The animal behavioural approach thus demonstrates how one must think of the origins of language in terms of a continuity and not in terms of rupture, as some habitually tend to do. Besides, to imagine the onset of language as a sudden and brusque event does not allow for transcending the contradiction formulated by Lévi-Strauss in relation to incest: if the incest prohibition is universal, then the phenomenon must be 'natural', but if each society formulates it in a different manner, then the phenomenon is 'cultural'.

If the generalization of language systems of double articulation allows communication needs to be satisfied even from limited word inventories, and for an unlimited range of meanings to be constructed, and this in the great majority of situations and even in our complex societies of today, the spoken language nevertheless seems to

be content with relatively simple utterances developed out of only a small number of components. Chafe has studied the base unit of oral discourse, which he calls the 'idea unit', and notes that it consists of a verbal element together with one or several noun elements. This unit comprises around seven words and lasts for two seconds of utterance. On the informational level, the idea unit seems to correspond to the amount of information on which the speaker can concentrate in any one given moment and which will remain accessible to an attentive listener.

These observations probably vary somewhat according to particular languages and in function of the structures that are specific to each. Halliday has adopted Chafe's demonstration concerning the length of oral utterances and has arrived at the same conclusions. He adds that the grammar of the spoken language is more 'fuzzy' than that of the written. In fact, the utterances found in conversation, and even more so in dialogues, reflect patterns of orality, being made up of brief sequences of words with little or no syntax. Chafe's analysis of the utterance structures of oral language concluded with the observation that the sentences of the spoken language are often difficult to identify and analyse. In his view, utterances of this type probably do not constitute cognitive and mnemonic process units. During the Upper Paleolithic, it is probable that different sociological and political phenomena went hand in hand with a sudden complexification of human societies. If ever there was a particular need for a language capacity over the long history of hominization, it was certainly during that crucial period for the future of man.

Elements of a conclusion

All of this supposes that between the Upper Paleolithic and the Neolithic eras there occurred a significant social, political and cultural evolution, a process that the available data certainly do not exclude. For this to have happened, one of the indispensable developments was that of political links within human communities whose dimensions were concomitantly expanding. There exist two errors of perspective concerning the transposition of a society based around chieftainships to one that is a form of state. The first error consists in presenting the change as arising out of an evolution towards greater civilization, in a certain way as passing out of 'primitiveness' to civilization. The second resides in a Marxist-type economic interpretation of a society as evolving from one reduced often to a state bordering on poverty and practising a subsistence economy towards a society practising agriculture and animal farming, which are presented as superior lifestyles. But since publication of the work of Pierre Clastres relating to the function of the State, there has been an awareness that the evolution towards the first states, which, with the invention of writing, also marked the entry of man into history, did not signify passing from a state of 'primitiveness' to a state of 'civilization'. Until Clastres, the expression '*non-State society*' gave the impression that such a society was incomplete and that it did not yet possess all the constituent attributes of a fully civilized one.

But Clastres demonstrated clearly that while 'primitiveness' might imply a chieftainship system, this is not necessarily related to a despotic system. The chief certainly intervenes to solve conflicts between individuals; following the terms

employed by Châtelet, the chief's utterance 'speaks' the consensus. His power derives from his prestige, from his manner of being and acting in the hunt, in warfare, in negotiations, in the general conduct of affairs. He is in the service of the community whose rules he may not breach and which maintains a critical watch over him. One might speculate whether passing from the political system of a 'non-State society' to a 'State-based society' might not also correspond to the passing from a single-articulation language system to a double one, or at least to the generalization of the latter, since, when there is a State, it is in its name that power is exercised and that, from that time on, the different constituent elements of the society now function only in the same way as do phonemes with a language.

Analysis of the various forms of social and economic organization of so-called primitive societies sheds some essential light on this point because it shows clearly that such societies are not situated at a chronologically 'anterior' stage to our societies, but that there may well be a sort of mutation which separates these societies from the so-called civilized societies. In this case it could well be useful to pick up the analysis of François Châtelet when he considered that the latter are in essence societies in which there is a strong ideological implication, because they suppose a constant reference to 'a social division of labour implying a distribution of the processes and procedures of political authority, thus to a unified centre of power and to the instruments for the realization of this power'. The establishment of a social order which is strongly marked ideologically, however, must necessarily be grounded in certain uses of language. For this specific function, not all forms of language are suitable. What the development of an ideology has in common with symbolization is that it presupposes the replacement or substitution of one thing by another. The elaboration of ideology implies furthermore the structuring and hierarchization of objects considered in such a way as to make power necessary and its exercise 'natural'.

All the essential elements are thus present for the transposition, as described in linguistics by André Martinet, to a system of double articulation. By transcending the individual particularities of objects, and by analysing them according to perceived relevant features and in terms of meaningful oppositions, it becomes possible out of a finite set of elements to create a system capable of producing indefinitely, but vectored in time (whence the notion of 'progress', which goes 'in the direction' of time), an unlimited quantity of objects (whence the notions of 'productivity' and 'growth', which are vectored as well). Perhaps the famous rules of exchange proposed by Claude Lévi-Strauss, by which all human social life are instituted, should be understood in the same context as the preliminary stage by which all human social life was instituted historically, so allowing much later, at the dawn of recorded history, the transposition in certain places to a 'State-based society' through the means of writing, the final application of double articulation.

From this perspective, one can postulate that there were three successive stages in the acquisition and application of articulated human language, each of which necessitated the shift towards double articulation, but each time on different levels and with distinct historical outcomes. The first instance would have to correspond to the 'discovery', no doubt in several different locations and through successive experiences, of the human possibility and capability of symbolization. During this period,

the double articulation would not have been attained except accidentally when a situation would have been experienced where the symbol could represent several different things, thus allowing for 'playing' with the reality and for 'representing' it. At this stage a developed syntax would not yet have existed, for the language would have been applying only a very few communicational elements, possibly of different natures (combinations of sounds, gestures, mimicry, etc.).

A second stage would occur when exchanges within a particular group tended to become regulated. In the exchanges that the individual made within the group and which had the effect of both constituting and reinforcing this group, a 'distance' would come to be introduced between the objects and what served to represent them. Progressively, the exchange of goods and females would come to reflect rules whose objective was to make foreseeable how members of the group would behave. In actual fact, socialization consists precisely in the learning of rules which will allow the child to find its place within the community by participating according to its rules in the whole gamut of its activities. It is impossible to situate precisely in pre-historic time the moment when the system of the three types of exchange became established in hominid communities. Obviously there will never be any direct evidence available on this point. However, ethnological observation of bands of hunter-gatherers allow it to be established that even in groups of such small dimensions the three types of exchange are in operation. The only observable difference is to be found, as has been noted, on the political level, since we are dealing in these cases, as in those of many other so-called primitive societies, with 'non-State societies'. The resolution of conflicts and the interpretation and application of the rules of exchange are left in the hands of a chief.

Finally, at the third stage of development, the same gradual shift could well have occurred for the written language as that described above for the first two stages, concerning the emergence of double articulation in the functioning of the oral language. Certainly, starting from unconnected figurative elements, there would have progressively emerged sets of stylized, abstract signs, which in turn led to the entry of certain peoples into history with the appearance of systems of writing. On each occasion, a close relationship can be observed between the transposition from a 'non-State society' to a 'State-based society' with the establishment of privileged links between the holders of power and those who had acquired the skill of writing. The transition from a figurative writing system to one comprising elements based on a phonetic representation might well be interpreted in the same way as the movement from a system of single-level articulation to one of double articulation, in the way that the spoken language had already long been manifesting it. The time gap between the spoken and written languages as far as the accession to double articulation is concerned would tend to suggest that this type of transformation is deeply embedded within a complex process of symbolization, abstraction, structure-building and complexification which had been under way for tens of thousands of years at least.

In conclusion, it seems to us that the question of the origin of natural human language, which has long appeared to be insoluble, cannot be definitively decided by the invention of a 'miracle' that occurred with the arrival of *Sapiens*. Quite to the contrary, all elements converge to indicate a long and slow process of separation by

which the hominids very progressively become distinguished from the other higher primates and more generally from other animal species. Biological and neurological developments created favourable structures for the future emergence of human languages. These developments were further potentialized by the appearance of new forms of cooperation within human communities. Such anthropological, socio-cultural and 'political' elements were determinant in allowing the transition to the specifically human functions of language. If these elements are not taken into consideration, researchers are reduced to imagining the appearance of a mutation from which solely *Homo sapiens* would have benefited and from which *Homo neanderthalensis* would have been excluded, as must equally be excluded any intermingling between the various varieties of hominids. An important linguistic consequence of this initial hypothesis is the affirmation of language monogenism. The theory of the proto-world language is in fact simply the necessary consequence of the 'originating miracle': given that a mutation similar to that which may have offered language to our species cannot reproduce itself, it follows logically that all languages must ultimately derive from a single ancestor. It hence becomes legitimate to reconstruct and present a primordial proto-language to the imaginations of a humanity whose initial brotherhood is thereby affirmed, which, perhaps, allows certain people to forget this today.

Guy Jucquois

University of Louvain

Translated from the French by Colin Anderson

Note

1. BCE = Before Common Era.