Chapter Nine Speech and Language

Communication

The essence of life is motion. It represents the interaction of energy and mass, within an optimum environment. In this regard, life depends upon the transmission and transformation of energy, in its radiant and chemical forms.

This is the basis of organic communication, whether it is conducted within the cells; the nervous system; or the endocrine system. Furthermore, this intercellular system of communication is paralleled by the transmission, and reception, of radiant and chemical stimuli between the individual organisms themselves.

Generally, all the mammal species have the same basic sensory systems although there are considerable variations in the degrees of sensitivity, depending upon the species and their ecological niches. However, nearly all mammal specie are particularly sensitive to aural stimuli.

Thus, whereas the eyes may be covered by the eyelids, the ears and their associated sensory systems, always remain open to stimuli - even when the individual is asleep. This appears to be an evolutionary adaption to predation.

The permanently active nature of the aural system makes it a particularly suitable form of stimuli reception for the nursing females of mammal specie. Thus, the cries of infants can be detected immediately by their mothers. In addition, the sensory systems of nursing females are highly sensitive to the vocal transmissions of their young. In this context, the vocalisations made by mammal infants are invariably transmitted at a higher pitch than the normal vocalisations of the adults.

The mammals infants normally utilise all the chemical and radiant stimuli, to motivate and control the adults upon whom they depend. In some ways, there is a close correlation between the types and usage of such infantile stimuli, and the adult stimuli used for mating. For example, most infants use a mixture of vocal, olfactory, aural, and tactile stimuli, together with the appropriate sensory systems. In addition, they use their sense of taste to avoid an excess of acid or alkaline substances in their food.

Most nursing females can identify their young by their individual sounds, smells, or looks. However, it is the vocalisation of the infant which is the most important, because the transmission of sound is least affected by variations in environmental conditions.

The utilisation of infantile stimuli is partly instinctive, and partly due to adaptive self-adjustment caused by the development of cognitive elements within the brain. In this regard, the storage and utilisation of infantile memories are essential for the long term survival and reproduction of the individual. Furthermore, they often help to determine the quality of independent behaviour.

In this context, any mammal infant which is likely to be dependent upon its mother for some time, and which may be separated occasionally from its mother must develop a strong memory regarding its mother's individual characteristics. For this reason, most newborn mammal infants memorise the visual image, vocalisation and smell of their mothers.

Imprinting

This characteristic of primary learning is known as ' imprinting' and can determine the long term behaviour of the individual when it becomes an adult.

The early 'imprinting' period of an infant's life develops during a time when the interaction of rearing stimuli, between the nursing female and the infant, is particularly intense. In this early period, it is very important for the infant to gain a consistent response from its mother in respect of the supply of food, warmth, transportation and security.

As a result, the infant maintains a fairly stereotyped combination of stimuli to develop a degree of reciprocal 'imprinting' upon the mother. In this regard, the mammal infant's most important initial requirement is to gain a consistent response to its stimuli.

In this context, the type of response sought by an infant will depend upon whether it is reared by one adult, or more than one adult. This is because the infant reared solely by one adult will only learn to seek a response from that one single adult.

By contrast, infants reared by more than one adult will learn to seek two kinds of responses. Thus, they will learn to seek a single response from each individual adult, and a mass response from a group of adults. This would also be true of an infant which was reared by a single adult, but which could respond with more than one adult in the earliest months of infancy.

However, as these response characteristics of the mammal infants are developed in the early periods of infancy, the infantile behaviour becomes ' imprinted' , and it is continued in adulthood. As a result, any individual which was reared in a single-adult environment would always tend to respond with other adults on a one-to-one basis.

Likewise, any individual which was reared in a multi-adult environment would tend to respond with other adults on a mass basis.

Response Seekers

In this regard, the infants which are reared in a single adult environment may be classified as Individual Response Seekers; and this term can be extended to such infants in adulthood, as they will continue to exhibit the same characteristics when they mature.

Likewise, the infants which are reared in a multi-adult environment may be classified as Public Response Seekers; and this term can also be extended to such infants in adulthood. For convenience, the phrases Individual Response Seeker, and Public Response Seeker can be abbreviated to I.R.S. and P.R.S.

In the context of the hominoid Ape specie, the nursing females normally give birth to only one baby per breeding cycle. The hominoid Apes differ from some other species of monkeys in that only the female rears the young. Furthermore, in the early months of infancy, the Ape babies are jealously guarded by the hominoid Ape mothers. As a result, the young Ape infants interact solely with their mothers.

The hominoid Ape, mother/infant relationship involves a degree of reciprocal vocalisation and responses by both the mother and the infant. As no other adults, or siblings, are tolerated by the nursing females in the early months of the brood stage, the infant responds solely with its mother during its 'imprinting' stage of life. As a result, the hominoid Ape infant becomes an Individual Response Seeker, and maintains this characteristic as an adult.

In this regard, the individuals of most mammal species are Individual Response Seekers, as the infants are invariably reared by a single individual in their early stages of growth. As a result, the adult males and females maintain their respective territories by means of one-to-one confrontations with other individuals of the same sex. In social specie, the order of hierarchical rankings is also determined by one-to-one confrontations.

In some mammal specie, such as Baboons and Lions, the dominant males may aggregate into gangs, or cliques, to maintain collective control of their territories. As a result, a confrontation between individuals may sometimes take the appearance of a mass confrontation, but these are invariably cases where one individual is confronted by a gang of individuals -- and not a genuine mass confrontation.

The LBI Broods

It is proposed that when the hominid specie developed their L.B.I. brood characteristic, the younger infant of such a brood would grow up within an 'apparent' multi-adult environment. In this regard, when the younger infant was born, the hominid mother would still be rearing and feeding the previous-born infant. As a result, this elder sibling could be perceived by the new born infant as another adult.

Therefore in a L.B.I. brood, the new born infant would seek a response from its mother in the normal hominoidal manner, but in addition, it would also seek a response from its elder sibling. When both the mother and the elder sibling responded to the new born baby in unison, this would comprise a genuine mass response.

In this context, as a mass response is a more powerful response than a singular response, the new born infant would seek to maximise this type of response as it developed. Furthermore when this infant became an adult, it would continue to seek a mass response from other individuals in the hominid community.

As a result, the L.B.I. broods would lead to a gradual change in the 'response seeker' characteristic of the hominid specie, because most individuals would develop into Public Response Seekers. The first born infant would become an I. R. S. (Individual Response Seeker), but all younger infants born into a L.B.I. brood situation would become a P.R.S (Public Response Seeker).

As adults, the P.R.S. hominids would need to be with a group of individuals, if they were to get their preferred mass response. Furthermore, the group would have to be facing the P.R.S. hominid.

It should be noted that this is not a hominoid Ape characteristic. For example, while Chimpanzees and Gorillas may gather in large groups, they do not share the hominid characteristic of one individual facing a large mass audience -- and performing to get a large mass response.

Organisation and Social Development

It is proposed that the demands of the P.R.S. characteristic would lead to changes in hominid organisation and social development. Thus the P.R.S. hominids would have a continual need to perform various activities before their community. In the context of the normal role of the dominant male of the hominoid Ape specie such activities would be likely to involve protection from predators, or protection from other competitive communities of the same specie.

In addition, the demands for a mass response could create a powerful stimulus for the extension of the food-sharing characteristic, as the acquisition and sharing of large quantities of food would evoke a mass response from a grateful community.

The group behaviour of the social hominoid Apes usually involves individual grooming, where the orientation of individuals within the group is relatively haphazard.

By contrast, the groups of P.R.S. hominids would tend to form inward-facing circles, as this arrangement would enable the group individuals to maximise their chances of gaining a mass response to their behaviour. This circular pattern of hominid groups is typical of present-day gregarious humans.

It should be noted that the essential element of a mass response is its unity. It is not the same as a series of individual responses. A mass response requires that all of the responding individuals should respond in unison. As a result, the development of the hominid P.R.S. characteristic would tend to lead to a consequential demand for a standardised response. It is proposed that this would result in the development of rhythm, rhyme, and harmonic vocal pitch.

In terms of group behaviour, the P.R.S. individuals could evoke a mass response by using their sexual triangles to create fear, tolerance, or a sexual response. In this context, it is proposed that the development of the P.R.S. characteristic would lead to the development of community singing and dancing.

Effect on the Mating System

It is further proposed that the development of the P.R.S. characteristic would also have an effect on the mating systems of the hominids. In this regard, the mating system which existed prior to the development of the L.B.I. broods would be a 'Gorilla' type of polygynous mating system. In this system, the dominant male would drive any young subordinate males out of its territory.

Thereafter, as Individual Response Seekers, the subordinate males would lead a solitary existence until they developed into dominant males, or were killed by predators. In this regard, these young subordinate males would be less likely to survive outside the home territory, because they would lack the group protection of the community.

However, when the hominids developed the P.R.S. characteristic, the young males within the community would learn to minimise their aggressive interactions, in order to maximise their chances of a mass response. Eventually, when such individuals became adults, they would be driven from the hominid community by the dominant male, in the usual way.

However, these P.R.S. males would be likely to form a gang with other young males, who had similarly been chased out of their home communities. Eventually, the most dominant of these young males would re-enter a home territory as an incoming dominant male.

However, the less dominant males would not be able to do this. Thus they would be forced to continue their group existence outside the home territories. Nevertheless, whereas solitary I.R.S. hominids might have been killed-off by predators, the group nature of the P.R.S. subordinate males would enable them to survive outside the optimum territories.

In polygynous mating systems, any female who has a breeding cycle which is synchronous with that of the dominant female, is also driven out of the home territory. Normally, such females would be unable to survive because of a lack of food, or because of predation. However, after the development of the hominid P.R.S. characteristic, such females could seek the group protection of the gangs of young subordinate males which lived outside the home territories.

It is proposed that the gangs of subordinate males would still have a group hierarchy. As a result, any female which was driven from her home territory would tend to seek out the most dominant male in the subordinate gang. This female could control the most dominant male with visual and vocal stimuli, in the usual way. In addition, the female would benefit from the food-sharing behaviour common to P.R.S. males.

As the gang of males would have no infants to support, this food-sharing characteristic would enable such a female to give her infants far more food than the females in the home territories could give their infants. In time, the solitary female would be joined by other females who had been similarly ejected from their home territories. As a result, a female hierarchy would be established which paralleled the group hierarchy of the subordinate males.

Monogamy

It is proposed that this subordinate male gang community would eventually develop into a monogamous male/female gang community, where the territories of the monogamous pairs overlapped with each other. Furthermore, the effects of the hominid P.R.S. characteristic on group behaviour, would affect the social arrangement of the gang community.

As a result, the territories of the monogamous pairs would be arranged in a circle. Thus, all of the pairs' territories would be protected by the gang of males, while all the individuals could fulfil their P.R.S. demands by socialising in the joint centre of the overlapping pairs' territories.

As the ratio of adult males to females in the joint monogamous systems would be relatively even, there would be a substantial reduction in the ratio of infants to adults. Furthermore, the progeny of the females would tend to reflect their parents' behavioural and physiological characteristics.

As a result, the males would tend to be smaller and more tolerant than the dominant males of the polygynous communities. In addition, the monogamous mating system would eventually lead to an even proportion of births, in respect of the male and female progeny.

As a result, the joint monogamous community could exist in a much more marginal environment than that required by the polygynous hominid communities.

However, the subordinate males would need to continually reduce individual aggression to maintain group cohesion. This would tend to encourage the reduction in overt aggressive characteristics, such as the large canine teeth. In this regard, the more individually aggressive males would probably be driven out of the group territory, by the gang of subordinate males.

It is proposed that this development of co-operative defensive behaviour would eventually lead to the evolution of co-ordinated group aggression, analogous to that of Wild Dogs. As a result, the gangs of subordinate males would eventually take over the optimum hominid territories, by driving out the sole dominant males of the polygynous communities.

In the context of hominid speech and language, it is proposed that prior to the evolution of the hominid L.B.I. broods the hominid species had similar systems of social interaction to that of the social hominoid Ape species. In this regard, hominoid social interaction appears to have been based upon the visual and vocal stimuli, which is used in most mammalian mating and reproduction systems.

Quadrupedal Mating Stimuli

For example, in quadrupedal species of mammals, the female normally initiates the mating process at the start of her breeding cycle. This often results in the raising of the pitch of the female vocalisation, and this increase in pitch attracts the male. The latter normally increases the pitch of his vocalisation in response. This increase in the vocal pitch has the effect of reducing the degree of aggression of the potential mating partner.

As the female reproductive process is generally much slower than that of the male, the female must manipulate the male in such a way as to ensure that copulation is achieved at the most appropriate time. In this regard, the female has two basic visual signals to indicate her physiological state to the male.

Thus, if the female stands still, with her head pointing straight forwards -- and raises her tail, this indicates that she is ready to copulate. Alternatively, if the female holds down her tail, and wheels around to face the male, this indicates a refusal to copulate.

Normally, the male will use tactile stimuli to prepare the female for copulation. Typically, this may involve nuzzling, or licking the female muzzle. In addition, the male may lick the flanks of the female, near the mammae. When the female is ready to copulate, she will lift her tail, and lower her head. In some mammal specie, the female will kneel down, or crouch, to help the male to copulate.

These two, basic visual signals of the female are modified slightly when the female faces the male. In this regard, if the female lowers her head, this is an indication of her readiness to copulate. Alternatively, if the female holds her head up, and turns her head away from the male, this indicates a lack of readiness to copulate

Ape Interactions

Similar tactile, visual and vocal stimuli are used by the social hominoid Apes when mating. Furthermore, in a modified form, they are also used when interacting with other individuals.

For example, a lowering of the head is an act of submission, while the shaking of the head is a non-aggressive act of rejection.

The social hominoid Apes also use their facial triangles and vocal stimuli to regulate individual relationships. The males are handicapped in this respect, because they can only use their positive facial triangle. However, they can vary the pitch of their vocalisation to increase, or reduce, the degree of individual tolerance.

The hominoid Ape females and infants have a negative facial triangle, which they can modify by changes in the shape of their mouths to produce a positive triangle. The negative facial triangle tends to increase the degree of individual tolerance, while the positive facial triangle tends to reduce it. Thus, by variations of body posture, vocalisation and facial expression, the social hominoid Ape females and infants can produce a wide range of aggressive and repulsive, fear-inducing effects; or tolerant and attractive, pleasing effects.

Primate Speech

In the context of present-day human speech, some of the more basic visual and vocal combinations, can be illustrated by the pronunciation of the words "yes" and "no", in some modern European languages. For example, the Italian word "Si" and the French word "Oui"; (meaning 'yes' in English), both involve a high pitched sound, which is coupled to a facial grin. This facial expression produces a negative facial triangle.

Alternatively, the English word "No"; or the French word "Non"; (meaning 'No' in English), both involve a low pitched sound, which is coupled to the pursing of the lips. This facial expression produces a positive facial triangle.

Primatological research has shown that the Chimpanzee species use only vowel, and semivowel sounds, to produce their vocal expressions. In this regard, an important warning signal used by Chimpanzees is the expression: "Waa" . This is used to indicate a possible danger to the Chimpanzee community, or the discovery of an unusual phenomena. In this regard, the semivowels 'W' , and 'H' , are the only consonants which these primates are able to pronounce. The 'H' consonant is used in laughter and communicating calls.

In this context, the utilisation of the 'H' consonant often involves the use of repeated vowel sounds, such as the "HA"-"HA"-"HA" used in Chimpanzee laughter, and the 'pant-hoots' used for Chimpanzee communication of discoveries of food resources.

It appears that the Chimpanzee "Waa" sound has been retained in many hominid languages to indicate things which are very important to the hominid specie. For example, the hominids constant need of water may have led to the "Wa" sound used in the English word: "Water"; the Latin expression: "Aqua"; and the similar sounding Australian Aborigine word: "Agwa" . (Both of the latter words mean 'water' in English).

In addition, there are the English expressions "War", and "Warning", which imply communal danger.

The first words

The first development of hominidal speech appears to have evolved prior to the emergence of the L. B. I. Brood characteristic. Thus, it is proposed that when the Australopithecine specie first started to become bipedal, their babies would tend to be as incontinent as present-day babies.

As a result, the Australopithecine mothers would tend to become drenched in their infants' urine and faeces. It seems probable that even the best Australopithecine mothers would be annoyed by this infant behaviour - and this would cause the infants to feel apprehensive about their mothers' reactions.

In the context of Chimpanzee infants: when the latter are afraid, or wish to placate an adult, they make a soft "Wheee" sound. This similar to the whining or whimpering of a young kitten or puppy.

Thus it is proposed that nervous Austalopithecine infants would also make such sounds when they felt incontinent. However, the issue of one single expression does not alert an individual as much as a repetition.

In this regard, the Australopithecine infants would probably make the initial repeats by accident, but as this would alert the mother more rapidly - its success would be reinforced by maternal praise. This would give rise to the single repeat phenomena, which is typical of human infants. In this context, the English expression "Wee"-"Wee" (meaning urine); and the expression "Ma"-"Ma", (which means 'mother' in all languages), are examples of single repetitions.

Primatological research has also shown that although the social hominoid Apes can only produce a limited range of vocal and visual effects, they can still distinguish between at least one thousand different objects. This indicates that the communication needs of these apes are relatively limited.

Thus, although they can distinguish between many things, they only appear to need to communicate the variations in their relative aggression and tolerance levels. Furthermore, all their communications appear to be based upon either infantile stimuli - reflecting their demands for food and protection; or upon the female and male sexual stimuli, which are based upon the demands of mating or reproduction.

Capacity to learn

Anthropological research into the speech and language systems of many of the world's existing hunter-gatherer tribes, show that these people have only a relatively small increased demand for communication, in respect of their environment. In this regard, most of the increase in spoken words concern the enlarged patterns of cultural behaviour, and a recitation ability to relate past tribal history.

These studies suggest that the main impetus for the increase in the human ability to differentiate, and vocalise, was not due to external environmental changes. Thus although the human specie can distinguish between more than one million different objects, the extra food resource and degree of social interaction of existing hunter-gatherer tribes, cannot account for this degree of qualitative and quantitative increase,

Furthermore, although individuals in existing hunter-gatherer tribes may only converse in tribal languages which have very restricted vocabularies, each individual nevertheless retains the capacity to learn the most complex of human languages.

It is proposed that the main cause of the increase in the physiological and behavioural adaptations concerned with improved communication, was the rearing of the L.B. I. Broods of hominid infants. Furthermore it is proposed that the improved hominid abilities, in terms of memorising; differentiating; and sequencing; were all standardised and harmonised by the development of the P.R.S. characteristic.

Importance of good infant rearing qualities

In this regard, long term zoological studies of many mammal species have shown that the dominant males and females, in any specie's community, are usually individuals who have been reared under optimum conditions. As these individuals tend to be the main progenitors of the each specie's long term physiological and behavioural characteristics, this emphasises the importance of good infant-rearing qualities.

In this context, it has been shown that in the optimum food resource and predation-free environments, good mothers rear the most normal infants, and these infants grow up to become the specie's most normal adults. Furthermore, these zoological studies have proved that normal adults survive, mate and reproduce more successfully than abnormal adults.

As a result, the normal social environment of mammals leads to the selection of any physiological and behavioural characteristics, which may lead to improvements in the rearing of the young.

However, because all mammal species are sexual species,(whose individuals comprise a mixture of male and female characteristics), no individual can ever develop perfect masculine or feminine qualities. As a result, there are never any perfect nursing females within any specie. Nevertheless, the characteristics of the best mothers in each generation will always tend to become the basis of the feminine element in any specie's gene pool.

In this context, the evolution of the hominid L.B.I. broods created special problems for the nursing females.

For example, the marginal increase in memory-based intelligence, due to the development of the hominids' P.R.S. characteristic, would lead to a corresponding increase in the size of the hominid brain - and a consequential change in the specie head-to-body ratio. As usual, this would lead to a further increase in the foetal stage of growth, and a proportional increase in the infantile stage of the L.B.I. Broods.

The food-sharing characteristic of the hominids would enable the nursing females to feed both their younger and elder infants for the increased period of the infants' concurrent rearing. However, the relatively long period of concurrent rearing would tend to have an adverse effect on one, or both of the infants.

This is because the nursing females would tend to treat their infants as though they were twins. The hominid mothers would be aware that each infant was different, but they would be unable to rear each infant independently.

This would tend to result in a reduction of rearing quality for one, or both of the infants. For example, either the elder infant would be treated as a baby, or the younger infant would be reared as though it was another elder infant. This could result in one, or both of the infants becoming relatively abnormal.

This lack of ability to rear each infant independently would tend to be a common characteristic of most of the hominid nursing females. As a result, many of their young would become abnormal adults, with reduced chances of survival, mating and reproduction.

However, this would create opportunities for rapid dissemination of any physiological or behavioural adaptations, which improved the degree of independent rearing of the younger and elder infants.

Names

In this regard, the infants could only be reared independently if their mother could find a way of differentiating between them - in order that each infant could be treated as a separate individual during the period of concurrent rearing.

In particular, the nursing female would have to be able to attract each of her infants independently, on a series basis. In terms of vocal stimuli, this would require the creation of separate names for the younger and elder infants.

It is proposed that any nursing female which could vocalise two distinctive variations would be able to rear two relatively normal infants, which would become relatively normal adults. Furthermore, as these adults would tend to survive, mate and reproduce better than average, their mother's improved vocal abilities would tend to become predominant in the specie gene pool.

Thus, it proposed that the normal evolutionary demands which select for good infant-rearing qualities, would tend to lead to the practice of differential naming for each infant within an L.B.I. brood.

In addition, although it is impossible for any individual mammal to become a perfect mother, it is nevertheless possible to predict the qualities which a perfect mother of a L. B. I. brood would need, in order to rear two perfectly normal infants.

For example, a perfect hominid mother would require a very good memory, in order to remember exactly the right diet, exercise and training required by each infant at any particular stage of its infantile development.

In addition, this mother would need a very good ability to differentiate, in order to give precisely the right kind of rearing, to the right infant at precisely the right time.

Furthermore, she would have to have a very good managerial ability, in order to sequence the various elements of infant-rearing in their proper order, and schedule independent feeding, grooming and training, for her dependent infants.

In this regard, linguistic studies have shown that the basics of language, namely: phonology; syntax; semantics; lexicon; and pragmatics all require precisely the same physiological and behavioural characteristics - in terms of memory, differentiation, and sequential management as the rearing of an L.B.I. brood.

Furthermore, comparative studies of the simple languages of hunter-gatherer tribes, show that if the nominal element is removed (i.e. , the names, nouns and their descriptive relations), the remaining vocalisation simply involves the same consonant and vowel sounds, which are used by the social hominoid Apes.

It is proposed that the development of the hominid practice of naming their younger and elder infants would eventually lead to confusion, as every nursing female would tend to use the same set of names. For example, during attacks by predators, some infants could be killed by running to the wrong nursing female. As a result, there would be an evolutionary advantage accruing to any individual infant, which had a different name from any other infant.

In time, these evolutionary demands would lead to the adoption of any genetic adaptation which improved the abilities of the nursing females to vocalise a wide range of easily distinguishable sounds. It is proposed that this would gradually lead to the oral and neurophysiological developments, which are associated with the main consonants used by the human specie.

Phonetic Pairing

In this context, it should be noted that many of these main consonants appear to be phonetically paired. Thus: in terms of their pronunciation, there appear to be hard, or soft, versions of the same basic consonant. Furthermore, in terms of the Roman Script, some of the pairs are graphical opposites.

For example, the original Chimpanzee semivowel "W" is phonetically paired with "M"; and if "W" is graphically rotated forwards through 180 degrees, it becomes "M". The phonetic pairs "p" and "b", can be likewise graphically rotated. The other phonetic pairs are: N-L, C-G, T-D, S-Z, F-V, and J-Y.

The present hominid fossil evidence suggests that neurophysiological developments were evolving in the aural, visual, and vocal sensory systems of the hominid cortex about 1.5 million years B.P. In addition, there is evidence that the position of the species' larynx dropped to a lower level in the throat, about 400,000 years B.P.

Thus it appears that the increase in the size of the hominid neocortex, due to the increased infant-rearing intelligence, led to changes of skull shape. In this regard, it is probable that these changes caused the foreshortening of the specie jaws, in order to maintain an optimum degree of weight distribution on the hominid vertebrae. This development allowed the specie to develop many new consonants through the temporary closure of the windpipe

In this context, the phonetic pairing of the hominid consonants suggests that the first hominid consonant was the nasal consonant "M" , which was developed from the hominoid Apes' semivowel: "W" . This would be followed by the evolution of the other nasal consonants: "N" and "L" .

Furthermore, after the position of the hominid larynx had dropped to a lower level in the throat, the hominids would be able to develop the stop consonants: "B" and "P" These would be followed by the other stop consonants, in order of increasing difficulty of pronunciation.

Linguistic studies have shown that infantile perception of speech is concentrated on the relative values of pitch, or voice-onset changes, rather than the actual pitch itself. Thus it is proposed that the hominid females used single repetitions of the early consonants, and teamed them with a single vowel to produce the early names. For example: "Ma-Ma", "Mi-Mi" or "Mu-Mu".

These could then be varied with different vowels to produce sounds like: "Ma-Mi". In this way, a few consonants could be used to produce hundreds of simple combinations.

It is further proposed that the hominids eventually started to name everything else of importance, within their environment. In this regard, it appears probable that any common object which contains a high pitched "E" , or "I" vowel was probably named by the females. For example the English words "Meal", "Milk" or "Meat". Likewise, any such objects with a low pitched "O", or "U" vowel were probably named by the males. For example: "Bull", "Boar" or "Dog".

There is no evidence that the increase in infant-rearing intelligence led to any major changes in the species behavioural patterns. However, the increase in intelligence would allow the hominids to exist in more marginal environments, and this could lead to further organic and behavioural changes.

However, the environment would always remain the main arbiter of hominid development. In this regard, the existing hunter-gatherer tribes show clearly that the possession of sophisticated infant-rearing intelligence does not necessarily lead to a full utilisation of that intelligence.

In this context, the development of a culture which is based upon an animal's reasoning powers, is as dependent upon environmental variations as all the other evolutionary changes.