

The Discovery of Paternity: Solving the Mystery of Birth

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Abstract

The discovery of paternity by our ancestors is an intellectual achievement of the greatest importance. With the end of ignorance about sexual reproduction, our species ceased to be wild apes and embarked on humanity's path to the future. We created the institution of marriage, of monogamous, exclusive mate selection, which made a child's paternity certain. The founding of the family and a revolution in kinship, parenting, identity, and social status followed. A family is the set of relationships and functions that are fundamental to human culture.

The culture of human ancestors prior to the discovery of paternity

Kinship (1)

A male chimpanzee remains for life in his mother's group. His mother's mother is usually not a member of his native group. His sisters leave the group when they reach puberty and eventually settle for life in a neighbouring group. His brothers are members of his group. His unrecognized sons are members of the group. The male chimpanzee's unrecognized biological father is a member of the maternal group. His unrecognized uncles (father's brothers) are members of the group. His mother's brothers are not members of the group.

Thus, a male chimpanzee's sense of kinship is limited to the fact that he has a mother and siblings living in the same group. But because he does not sense the paternal connection, the ideas of family, continuity, relatedness, and generations are not part of his identity.

A female chimpanzee's sense of family is similarly limited. She does not live in her maternal group. Her sister is probably not a member of her group. She lives with her sons for life, and with her daughters until sexual maturity. Her son's offspring go unrecognized. Her daughter's offspring live in another group.

The extension of the concept of family to the kin of one's mate (spouse, in-law) does not exist. The sense of relatedness is very much confined to the maternal group and does not extend to the sister's group or to the daughter's group. A sense of 'foremothers,' or 'descendants,' or generations is non-existent.

Kinship (2)

A chimpanzee mother knows her son. She knows her daughter. A daughter knows her mother. A son knows his mother. Brother and sister know each other.

If a female chimpanzee's sister or brother are members of her group then her offspring know they are related to them. Such sons and daughters know their aunt and uncle, who know their niece and nephew.

A chimpanzee does not know their father. A chimpanzee male does not know his son or daughter. The males of the group are known as mother's mates. There is no awareness that a male, who mates with a female who subsequently gives birth, is a sperm contributor.

Kinship (3)

Kevin D. Hunt, *Chimpanzee: Lessons from our Sister Species*, Cambridge University Press 2020, University Printing House, Cambridge CB2 8BS, United Kingdom, Page 398

“Bonobo males are particularly eager to ally themselves with and please their mother. [Kanzi] looked on [Sue] as a mother, giving him motivation to please. A female chimpanzee leaves her mother, and so as an adult has no instincts regarding mother-like figures. She avoids males. Male chimpanzees pay little attention to females and, while they may retain affection for their mother, they pursue their own program in the wild; mother's opinion matters little. A male chimpanzee might care what a dominant male thinks about him [...]. So, chimpanzees are difficult to motivate; bonobos are not. Chimpanzees could master language in the right circumstances, [...]; it is only a matter of motivation.”

This passage, in a nutshell, states the importance of personal relations of kinship and social status for our species. A chimpanzee, or a bonobo, or a human, during the course of infancy, youth, adolescence and maturity acquires such relationships. For the duration of adulthood, their actions and behaviours are motivated by, and within the context of, these relationships and the emotional meaning of them. The desire to please, the wish that others have a good opinion of one, the need for approval, allies, and affection, are a driving motivation for the behaviour of all three varieties of our species.

Differences between the three varieties, in the extent of kinship, the composition of the family, and the methods of acquiring social status and determining rank in the group, account for the differences in the levels of achievement, sophistication and complexity of each variety's culture. The larger the fraction of the “group” that are considered family, individuals that one is related to, the greater the cohesion of the group and the stronger the motivation to be curious, innovative, analytical, altruistic, loyal, etc.

Kinship (4)

Chimpanzees, bonobos and human ancestors are ignorant of the mammalian reproductive process. Chimpanzees, bonobos and human ancestors are sexually promiscuous. Mate selection is random, but modified by the social status of the individuals. From birth, the three varieties of ape have relationships of kinship with their mothers, sisters and brothers, but are not aware of paternity.

A stable, territorial group of chimpanzees, bonobos, and human ancestors consists of the males, who were born in the group and never left if, their mothers and occasionally their sisters, and

females adopted from neighbouring groups. The community is a philopatric group. The male cohort of the group have known each other all their lives. They are friends. Some of them are brothers and are kin. There is a possibility that one of them may be the brother of another's mother. Contemporaries are former playmates. Elders are teachers, leaders, and role models to the young.

Male members of neighbouring groups are strangers. Members of such groups are not known to each other, not having grown up together. They are rivals, possible enemies.

Kinship (5)

One of the unstated assumptions of mainstream paleoanthropology is that the mated pair has been part of the culture of human ancestors from earliest times. This also assumes that the change from promiscuity, the most probable method of mate selection of the common ancestor of humans, chimpanzees, and bonobos, to exclusive pairing occurred at an early date. What would be the reason for such change?

What a chimpanzee knows and does not know (1)

Every bit of new knowledge acquired by human ancestors was learned from nature. The natural phenomena that a chimpanzee is familiar with are frequently caused by hidden processes. Hidden in the sense that the causes could not be seen, touched, or otherwise sensed. But this ignorance did not prevent a chimpanzee from surviving, subsisting, reproducing and having a full life.

What does a chimpanzee resident on the shore of Lake Tanganyika know about water? He knows blood, clouds, dew, dry, hail, lakes, mist, moist, ponds, rain, rivers, thirst, and urine. He is not familiar with boiling, condensation, evaporation, freezing, ice, oceans, ice, snow, and steam.

Human ancestors gradually became more intelligent over tens of thousands of generations, as the brain was stimulated by handiness, in turn, stimulated by bipedal posture. This gain in intelligence meant concurrent gains in curiosity, creativity, and imagination, which in turn led to increased ability to ask questions, make assumptions, and form hypotheses about the hidden cause of familiar effects.

What greater mystery could be contemplated by such an ancestor than his own birth, growth, maturity, and death. Questions of origin and creation are fundamental to the mythologies of every human culture. The solution of the mystery of birth was the discovery which initiated the intellectual and cultural revolution leading to today's civilization. This event was the occasion when a large brain became a mind. Perhaps it was the first time that a question about the unknown, not related to material and physical needs, was answered in a practical and useful manner and humans experienced a new thrill and satisfaction of discovery.

What does a chimpanzee know about biological reproduction? She knows that an infant emerges from her vagina, that during the preceding period her abdomen gets larger, that her offspring is a fully formed chimpanzee when it is born, that there is a tube attached to the infant which withers and falls off, and that her offspring are totally dependent on her for feeding, protection, and transport.

She knows that, when she copulates, a male inserts his erect penis in her vagina and ejaculates his fluid there. She does not know of the connection between copulation and birth, nor of conception, eggs, fertilization, fetus, gestation period, ovaries, placenta, prostate, sperm, semen, testes, and womb. She may have observed other animals copulating, or female birds, reptiles and fish laying eggs, or female mammals giving birth, or male fish spreading milt.

A male chimpanzee has similar knowledge. He also knows that ejaculation is a pleasant sensation which he wants more of, that his capacity for copulation depends on his ability to get an erection, that sight of and proximity to a receptive female stimulates his sex drive.

What a chimpanzee knows and does not know (2)

African Exodus: The Origins of Modern Humanity; by Christopher Stringer and Robin McKie; pub. by Henry Holt and co. Inc.: Owl Edition 1998, p. 194

“Intelligent life on a planet comes of age when it first works out the reason for its own existence”; quote from Richard Dawkins; to paraphrase “[Modern human culture] comes of age when it first works out [the processes of life, birth and death]”.

As human ancestors became more intelligent and curious, the questions foremost in their minds would be related to their own existence. What happens to me when I die? What is life? Are humans special? What are our origins? Were we created? Or are we animals? Where do babies come from? What causes birth? Why are there two sexes? Is there an after-life? Is there a soul? Is there a world of spirits?

The most accessible, answerable question is the one about the process of human reproduction - “the facts of life”, “the birds and the bees”. The other questions, of life, death, afterlife, origin, creation, are still being discussed.

What a chimpanzee knows and does not know (3)

A traditional society is a culture where change is resisted. The customs and practices of parents and elders are imitated – “it was good enough for my daddy so it’s good enough for me”. Such a culture is conservative, conformist, and static. The way of life of most species of animal is like this, particularly animals that are as specialized as the polar bear, the whale and the panda.

Human ancestors had a greater potential for cultural change because of the migration of sexually mature females, handiness, and a tendency towards generalization rather than specialization. They had a great potential and ability for curiosity, learning, non-conformism, and innovation, which came into full bloom in the last 100,000 years. They were actors rather than reactors; they themselves became agents of change.

A traditional, closed culture is focused on the present and the past. A progressive, open culture is focused on the present and the future. The future of the group in such a culture, of the descendants, has a greater cultural impact than the individual’s future, death and the afterlife.

What a chimpanzee knows and does not know (4) Survival

The fundamental, instinctive motivation of a wild animal is survival, its will to live. To this end, it maximizes its security from predators and prevents others from access to its territory and resources. This motivation is entirely selfish.

A female wild animal is also motivated to ensure the survival of her offspring. Thus, her fundamental self-centred motivation also provides everything for her infant. It is stimulated by the emotional attachment (total dependence, unconditional trust and love) of the infant for their mother. Maternal behaviour includes the parental, instructive, and demonstrative actions, also for the total benefit of her offspring.

If the wild animal is part of a social group, then group survival is part of the individual's fundamental drive. This includes a parenting behaviour towards all infants in the group. A wild animal's motivation also includes mating, which is essential for the survival of any lifeform as a species.

The mating behaviour of wild animals determines whether the gene pool of the species maintains maximum diversity or trends towards increasing specialization. Whether mating is promiscuous or exclusive or random, the percentage of males who succeed in fertilization may vary widely from all to few.

What a chimpanzee knows and does not know (5)

Male human ancestors, like chimpanzees, are well-organized. This behaviour is essential for group hunting and border patrol. It provides a chain of command, leadership, decision-making and regular assignments (division of labour). Organization is facilitated by: 1) the males do not leave the native group and have known each other all their lives; 2) they go through the stages of infancy, adolescence, and maturity together and are constantly competing for relative social status; 3) the alpha male has qualities of bravery, experience, generosity, leadership, sociability and physical strength. The males are intimate friends and companions who have a solidarity that enables them to act with a common purpose.

By contrast, most female chimpanzees and, probably, human ancestors, leave the native group upon sexual maturity, and settle in a neighbouring group to give birth for the first time. They have left behind their kin, mother, brother, and, usually, sister, their youthful companions, and everyone they have ever known, to join a group of strangers. Thereafter, they are preoccupied by the requirements of motherhood, such that opportunities for making new friends and companions, and organizing with their fellow females, are limited.

Handiness (1)

The chimpanzees who were physically isolated in the highlands of east Africa became the ancestors of humans. The adaptation that differentiated them from other chimpanzees was handiness. Over the course of millions of years, it was their development of manual and digital dexterity, hand-eye coordination, opposable thumbs, flexible wrists and fingers, sensitive fingertips, and the precision grip that directed their evolution. Eventually it enabled them to play

piano, guitar, tennis and golf which no other ape is able to do. Their ability to manipulate objects was a significant stimulus of curiosity, investigation and learning about their natural environment.

Eventually, handiness meant that the forelimbs were unavailable for terrestrial locomotion. The human ancestors became more and more adapted to walking and standing upright to the point that the legs, arches, ankles, knees, hips and spine relocated to a fully evolved bipedalism. A question remains: did infants cling to the fur of an upright walking mother?

Handiness was the input and braininess was the output. Evolution and adaptation are processes of bio-feedback. The conscious, the constant flow of sensation and experience, are the inputs, and the unconscious, the ongoing process of memory, recording, storage, classification, and playback are the output.

Handiness (2)

Other intelligent species – elephant, whale, dolphin, orangutan, crow, octopus – have memories and mental abilities to learn on a par with humans. Without hands, none of these species has developed a culture on the human level. A trunk or a snout or a beak or a tentacle is an inadequate instrument for interacting with, observing, and manipulating objects in nature.

The hard evidence preserved or protected in the soil: bones, teeth, fossils; corpses, burials; shaped stone; ash, hearth; middens, bones, shell, ivory, horn; seeds; paint; carving.

Absent, ephemeral, circumstantial evidence: anatomical, human hair, skin, flesh; material, wood, fibre, plant, animal, hide, sinew; social, kinship, status, class, learning, mating, intimacy, communication.

What is the point of shaping stone and manufacturing a durable tool if it cannot be carried to where and when it is needed? Chimpanzee tools are single-use at the place of manufacture. They may be reused in the same place for the same purpose by the same or another user. How does a quadruped carry a blade? Does a biped carry it manually, or on a belt, or in a backpack?

Handiness (3) Bipedalism

Which came first, handiness and manual and digital dexterity, or upright walking? Is handiness the result of bipedalism, or is upright walking a consequence of precise, tactile grasping and gripping with hands, wrists and fingers, i.e., the forelimbs becoming unavailable for locomotion?

Handiness (4)

The human hunting and gathering lifestyle is the same as that of their chimpanzee ancestors, and it persists to the present in non-arable areas. It was augmented by the introduction of cultivation of plants about 12,000 years ago.

The reason a chimp cannot make flakes from a suitable stone is not because of lack of intelligence, but because of lack of handiness. Humans had been bipedal and had freed up their hands for a million years before flaking.

The discovery of paternity and the beginning of monogamy

Paternity (1)

The questions of when and where the knowledge of the reproductive process was acquired are impossible to answer for the usual reason – the meagre archaeological and fossil record provides only hard evidence. Nevertheless, we can determine the latest date that it must have happened from historical knowledge provided by paleontology, archaeology, and paleoanthropology. There was a series of events in the Late Stone Age which forms a chain of cause and effect starting with the discovery of paternity and the consequent elimination of reproductive ignorance.

The events include the institution of monogamy, a revolutionary change in mate selection, a new knowledge of identity, kinship, family, ancestry, lineage, and heredity, the beginning of unconscious, unintended selective self-breeding, respectful burial by sons and daughters of their parents, and a profound new awareness of past and future. Subsequently, humans acquired an understanding of breeding by the control of mate selection and fertilization. This new knowledge led to the domestication of the wolf, and, more recently, the production, distribution, and storage of cultivated food embodied in the horticultural revolution.

The consequence of this sequence of events, known as the dawn or the great leap forward, was the development, following a few tens of thousands of years of self breeding from selective, exclusive, monogamous mating, of modern, creative, innovative, and imaginative Homo Sapiens. Each successive generation of humans experiences a cultural revolution, the pace of which constantly accelerates and may never stop.

Paternity (2)

All the clues about reproduction that humans were already aware of would help them to arrive at a comprehensive and accurate description of the behaviours, anatomical organs and biological processes involved, even though much would remain hidden. The key to understanding is to connect the acts of copulation and birth and make them into a single process. It is necessary to imagine, to assume, and to reason that a female agent – the egg – and a male agent – the sperm – combine in the unobservable phenomenon of fertilization.

Knowledge about reproduction came to human ancestors from various sources:

- 1) personal experience and memory of infancy, nursing, growth, the changes of puberty, sexual communication and stimulation, intercourse, ejaculation, pregnancy, birth
- 2) observations of their fellow humans
- 3) observations of the similar behaviour and experience of the flora and fauna in their environment, particularly other mammals
- 4) the coincidence that copulation and birth occur through the vagina
- 5) the deposit of a fluid, from inside the male's body, into the interior of the female's body
- 6) memory of a particular occasion of intercourse that took place nine months before a birth

- 7) the observable differences between males and females; the ubiquity throughout nature of sexuality and sexual behaviour; a fundamental process of reproduction of all living things, plants, animals, insects, worms, fish, reptiles, birds, mammals
- 8) eggs are everywhere; male fish produce observable milt; there is a period of gestation
- 9) knowledge of the umbilical cord, afterbirth
- 10) facial resemblance between mothers and offspring; resemblance of a child to a man that mother has mated with.

Human reproduction

p. 216, African Exodus, Stringer and McKie, quoting Irven Devore

“Anthropologists have always assumed that evolution carried the human species up to the dawn of modern society.....After that, it is assumed that culture took over as the shaper of our behavior.”

The basic function enabling survival and continuance of a species is reproduction. The basic relationship of reproduction by chimpanzees is the mother-infant pair. The basic relationship of human reproduction is the father-mother-children family.

Why was the natural system of mating and infant care which had worked successfully for millions of years changed? The system was based in biology, instinct, hormones, and the mammalian reproductive organs. Why modify it at the point of mate selection? Because men wanted to ensure, guarantee, and control the paternity of their own children. A man wanted to prevent any other man from having sexual access to the mother of his children.

Was the discovery of paternity made by an intellectual – an acute observer of nature, with a superior ability to ask the right question, to make the useful assumption, to imagine a plausible hypothesis, and creatively answer his own question with the correct theory? Or, was it serendipitous, i.e., the ‘blue lagoon’ scenario, where a man and a woman, the sole survivors of a catastrophe, reproduced and from personal experience figured out the facts of life?

The “Blue Lagoon” scenario

Under what circumstances did human ancestors come to understand their reproductive process? It seems likely that ‘how are babies made?’ and ‘where do babies come from?’ were the kind of mysteries that curious but ignorant humans had often contemplated. Nature, the only source of experience and enlightenment available to us, is full of such mysteries.

Perhaps the answer to this question was “discovered” by a couple, a man and woman or a girl and boy, who were the sole survivors of a natural disaster which left them separated from their fellows. Perhaps they were washed up on an offshore island following an earthquake and tsunami. Perhaps there was a devastating flood, wildfire, volcanic eruption, or epidemic.

If they were able to subsist in their new circumstances, their subsequent life would be in accordance with the nature of their species. They matured and had sexual intercourse only with each other, and the woman got pregnant and gave birth.

Paternity (3)

The institution of monogamy meant profound changes in mate selection and the sexual behaviour of human ancestors. Wild chimpanzees are promiscuous like most mammals and copulation regularly occurs in the group in a non-selective way. When a female is in estrous or receptive, any and all males have the opportunity to mate with her.

However, there is a one-time selection in the fact that a mature female chimpanzee usually leaves her mother's social group. After a period of wandering from group to group, she will get pregnant and then settle permanently in the different group. The group that adopts her does not include her father and brothers who remain in the natal group, so incestuous sexual relations will be avoided.

Paternity (4)

Jared Diamond, *The Third Chimpanzee*, Perennial edition 2006, HarperCollins Publishers, 195 Broadway, New York, NY 10007, page 70

“But the chimpanzee system, in which several adult males are likely to copulate with the same estrous female, also wouldn't work for us. The result of that system is that a chimpanzee father has no idea which infants in the troop he has sired. For the chimp father that's no loss, as his exertions on behalf of troop infants are modest. For the human father, however, who will contribute significantly to the care of what he thinks is his child, he had better have some confidence in his paternity – e.g., through having been the exclusive sexual partner of the child's mother. Otherwise, his child-care contribution may help pass on some other man's genes.”

The word “father” is used here with two meanings, a biological one indicating a genetic relationship, and a social one indicating kinship. A chimpanzee male is not aware of either relationship. My hypothesis is that an understanding by human ancestors of the biological relationship resulted in a desire for kinship. Knowledge of paternity led to males wishing to be able to say “my son, my daughter”. Confidence in paternity required that a mother have an exclusive sexual partner and the social institution of monogamy provided this exclusivity.

This cultural change from promiscuity to monogamy requires an explanation. What are the reasons that human ancestors made such a profound reform of individual sexual behaviour, mate selection, group social structure, and parental care? The assumption of “*The Third Chimpanzee*” is that there was a conscious need for additional parental care of the infants plus an unconscious imperative to give such care to one's own genes. Alternative to these assumptions is the hypothesis that, following the acquisition of a true and sufficiently comprehensive knowledge of the ape reproductive process, males felt the need to have the same kinship relationship that females had always enjoyed with their offspring. This required that a woman promise, by means of a contract and solemn ceremony witnessed and enforced by the group, to have intercourse only with the man who promised and contracted to do the same with her.

Paternity (5)

Knowing the connection between human mating and birth, that one is the cause of the other, and a hypothesis of internal fertilization and conception, leads to the concepts of paternity and the equal contribution of the mated parties in the process of reproduction. This brand-new knowledge spread through the human population by the existing mechanisms of cultural transmission.

It seems clear that when males became aware of fatherhood, the relationship of kinship with their offspring became a fundamental part of their identity. They felt possessive of them and they wanted to make the relationship and their own contribution certain by preventing the female from mating with every other male. The solution to this need was the innovative institution of monogamous mate selection.

The foundation of the family and the cultural revolution that followed

Family and kinship (1)

The male human ancestor's original sense of self, that of his species (chimpanzee, ape-man, australopith, hominid), his co-operating, co-habiting group, his kinship with his mother, his social rank in the hierarchy of the male cohort, transformed to something broader and different. The new identity eventually includes family, clan, tribe, nation, language, and culture. It covers ancestry, descendants, lineage, heredity, and physical characteristics. It includes social status, class, manners, place in the division of labour, and possessions. The family extends from mother to father, parents, grandfathers, grandmothers, wife, husband, spouse's family, in-laws, children, grandchildren, cousins, and heirs.

The expansion of the family, of the sense of relatedness, of having so many more kinfolk, widened everyone's perspective of space and time. The past and the future had a totally new relevance, continuity, and connection, to males and females alike. New motivations arose, to be creative, to leave something to the next generation, and to contribute to society. Whereas previously a wild male human ancestor viewed the purpose of life to be born, to grow, mature, age, and die, now the future of his family meant so much more as part of culture, society, civilisation, and history. The awareness of the future introduced the possibility of change, of innovation, invention, creativity, and the products of imagination, the interactions of the conscious and unconscious minds.

Why is this new awareness of the future dependent on men becoming knowledgeable of their involvement in the reproductive process? A woman's awareness of birth was instinctive and natural, part of her genetic inheritance, of her original identity. A man's awareness was a change, an innovation, an adaptation, and was the impetus for a new relationship of kinship and family. It was an unprecedented change in behaviour, leading to profound change in social structure and methods of status determination.

Motherhood and maternal behaviour are biological and involuntary, programmed by genetics. Fatherhood is a recently acquired social status, a learned, voluntary behaviour, a different kind of parenting, that changed men profoundly. This new kinship status and knowledge of descendants

and inheritance stimulated an expansion, focussed on the future, of a man's intellectual, cultural, and technological horizons.

Today there is a greater fascination with the genealogy of one's family than ever before. This lineage, this sense of belonging to a family, a group of individuals related by birth or marriage, extending over time, became and still is a most meaningful component of one's identity. But it did not exist before the ancestors became aware of paternity, the means of conception, and the reproductive process from copulation to birth.

The male's contribution to fertilization and his acquisition of parental status gave him new kinship relations. He already had a position in the male hierarchy of the group, identified as dominance or submission, leading or following, decision-making, and giving or taking orders. This divergence of rank was manifest within the new social institution of monogamy and of the intimate relations between dominant husband and submissive wife, which over the generations came to define marriage.

Family and kinship (2) Extended family

The family is the locus of naming. Personal identification becomes necessary, convenient, and customary. Mother is named mama, father's name is papa, and baby is given a name. These become the first words that an infant learns. Names are useful to distinguish and refer to all the brothers, sisters, parents, grandparents, aunts, uncles, and cousins, plus the spouse's relatives, and the brother's wife's family, both present and absent.

The extended family includes the living, the departed, and the descendants: those younger and older, the future and the past. In the imagination, the number of individuals, relationships, and generations is limitless both forward and backward.

Does a system of monogamous, lifelong mate selection maximize the diversity of the human gene pool? Is the number of individuals whose genes are passed to the next generation greater than any other method of mate selection? Where one male mates with several females, an excluded male's genetic inheritance may never be passed on.

Family and kinship (3)

Males are dominant over females because they are larger, stronger, more aggressive and better organized. A woman is submissive to a man because she is smaller and less aggressive.

The discovery of paternity was acted upon by men for their own benefit and, eventually, of their sons. The institution of monogamy – the new method of mate selection – required the woman to be sexually faithful to the man for life. Her children were therefore known with certainty to be the result of her husband's inseminating her, ejaculating in her vagina, fertilizing her and conceiving with her.

The resulting family, consisting of mother, father, sons and daughters, was 'led' by the man and it was his individual social status that determined the family's place in the group. Kinship and the relations with in-laws centred on the man, i.e., the wife joined her husband's household, and usually the lineage and generations were recorded from father to son.

The driving force of human genetic evolution was transformed from natural selection to artificial breeding; from the chance provided by promiscuous mating to the certainty of selective breeding.

Family and kinship (4) Marriage

Monogamous mate selection developed into the institution of marriage. Men propose a contract of marriage and women either accept the offer or reject it. The male role is active, he is the suitor, the pursuer, while the female role is passive. This relationship embodies the overall distribution of power in human society; both individually and as a group, men have higher social status than women.

Family and kinship (5)

The Great Change (p. 198, Stringer & McKie) was not a biological change nor a technological development, but a cultural change. It was an intellectual achievement which led to a behavioural change, which led to far-reaching developments in family, kinship, and social status. Men became motivated to create and innovate for their newly recognized descendants. The future acquired a new meaning of posterity, progress and improvement.

All learning comes from the book of nature. Human curiosity and creativity are stimulated by observation of behaviours and functions that occur naturally and may be made use of or imitated by humans.

The connection with the future that men acquired through paternity was instrumental in providing incentives to contribute to the lives of descendants. Without that connection men were completely self- and gender-centred within the context of the ancestral social group, hierarchy, and status. Subsequently they were somewhat less self-centred and included sons and grandsons in their own group, i.e., the patriarchy.

Mate selection (1)

The prevention of random mating required a revolution in human culture. No longer did females mate with all or most of the males in her group. A new method of mate selection leading to a permanent monogamous relationship was instituted. Selection was based primarily on the social status of the candidates and such selection was initiated by the males.

High social status gave a man priority in choosing a mate. His choice was determined by the woman's propinquity, social status, docility, and physical appearance. Men chose wives who lived nearby and therefore were similar to him in ethnicity, language, culture, class, and behavior. She may have been related to him or known to him. A high-status man was more likely to choose a high-status woman.

A man's choice is an exercise of his power in the group. The relationship of the partners in the new exclusive pair-bond is also a power relationship in which a man is dominant and a woman is submissive. A successful pairing usually means that the woman obeys the man.

Family and other pre-existing kinship relationships are a determining factor in such choices. A chief's son is more likely to choose his ally's daughter. The woman's parents have a lot to say about who chooses their daughter.

Mate selection (2) Self-breeding

The conscious purpose of human monogamy was assurance of paternity. The unconscious result was selective self-breeding. Facial structure was one of the characteristics of women selected by men, that determined the physical appearance of modern humans. After countless generations of selection, the ideal of a beautiful human face is a flat, vertical bone structure with a pointed chin, protruding nose and no brow ridge. Also selected for were full lips, even teeth, clear complexion and light-coloured skin and eyes. The shape and size of a woman's hips, waist, breasts and thighs were also determining factors in the physique preferred by high-status men.

Since monogamy began, hair has been one of a woman's physical characteristics, indicative of ideal femininity, selected. A hairless face and maximum growth on the scalp are desirable traits. Pubic and armpit hair, of a different structure than hair on the rest of the body, have not been selected. Hairlessness on the torso and limbs, like the face, has also been preferred. A man's beard is a factor, a masculine characteristic, in his social status relative to other men.

Mate selection (3)

The primary criterion for selection of brides for the past 100,000 years is that she is docile, i.e., acquiescent, agreeable, compliant, conformist, consenting, co-operative, deferential, dependent, devoted, domesticated, dutiful, humble, malleable, meek, obedient, obsequious, passive, pliant, resigned, servile, subject, submissive, subordinate, subservient, tame, teachable, unresisting, willing.

Mate selection (4) Breeding

When order and purpose are incorporated into the process of mate selection, then selective or artificial breeding are the appropriate terms. Order normally means requiring a female to mate only with the selected male. Purpose means ensuring the birth of offspring with known parentage and desirable characteristics.

Ordered mate selection is a behaviour of many wild animals but purposeful selection is a human behaviour. Wolves, a social animal, restrict mating to the alpha pair of the pack. This behaviour limits the number of offspring and enables the pack to subsist in its territory. Moose, a solitary animal, have an annual rut, which results in a group of females mating with the male winner of the contest. This behaviour maximizes the copulation opportunities of the high-ranking male.

The wolf was domesticated by humans by preventing female wolves from mating with unselected males. The selected male was chosen for docility, obedience, and juvenile appearance. Over numerous generations these characteristics of the dog became more and more entrenched in the offspring of such intentional breeding.

Thoroughbred horse breeders prevent the copulation of a mare with all males except the selected stallion. The male horse is selected for his ability to run fast. The female horse is selected for her

bloodlines, i.e., the number of fast runners produced by her female ancestors and other relatives. The purpose of the selection is to produce offspring with enhanced ability to win races against other thoroughbred horses.

A thoroughbred horse breeder and the tamers of the wolf have accurate, scientific knowledge of the reproductive process of mammals. They understand that there is hidden fertilization of the female egg by the male sperm within the female body and the result is the birth of an offspring. There is an awareness of paternity, the unseen function of the male following copulation. Wolves, moose and all wild animals do not possess this knowledge and any mating selection that may occur is instinctual, programmed by genetics and the needs of survival.

When human ancestors acquired such knowledge, they instituted a form of breeding of their own species that was ordered, with an original purpose that was social rather than biological. The physical and emotional characteristics inherent in the children resulting from the selective genetic pressures of marriage, were unintended side effects, except that such qualities were considered desirable by one marital partner or the other.

Mate selection (5)

The desirable qualities of a woman as selected by men to be their wife, in a preliminary order of importance: 1) submissiveness; 2) lineage, male parent; 3) beauty, skin, hair; 4) bravery, strength; 5) fertility; 6) parenting skill; 7) femininity.

The desirable qualities of a man, determining social status, as selected by other men: 1) strength, muscles, endurance; 2) courage; 3) lineage, family; 4) charisma, leadership, success; 5) intelligence; 6) honesty, fairness; 7) masculinity.

Burial

Burial is what children do for their deceased parent. A knowledge of paternity, family, ancestry, and lineage is a prerequisite for the behaviour of honouring, respecting, and memorializing the departed family member.

Domestication (1)

Nicholas Wade, *Before the Dawn*, Penguin Books 2007, Penguin Books Ltd., 80 Strand, London, England, p.177

“Viewed in this context, the gracilization of the human skull looks very much like one of those changes that come along for the ride when a species is undergoing pedomorphosis or domestication. Gracilization, Wrangham believes, occurred because early modern humans were becoming tamer.

And who, exactly, was domesticating them? The answer is obvious: people were domesticating themselves. In each society the violent and aggressive males somehow ended up with a lesser chance of breeding. This process started 50,000 years ago and, in Wrangham’s view, it is still in full spate.”

How was this process of domestication accomplished and why was it started? The method was by instituting monogamy, which requires females to be sexually exclusive. The new social custom, replacing promiscuity, gave her exclusive male partner confidence in his paternity of her offspring. Paternity, and fatherhood, was a new relation of kinship, and it was recognized following the cognitive breakthrough entailed by a full understanding of the human reproductive process.

Generations of the selection of females by males required by monogamous sexual behaviour has led to the breeding of modern, civilized homo sapiens with a gracile, tame and less aggressive nature than our wild ancestors.

Domestication (2)

The first animal domesticated by humans was the wolf. The archaeological record shows the bones of humans and dogs in close proximity 40,000 years ago. About 12,000 years ago horticulture, the breeding and cultivation of plants for human consumption, began. Subsequently, humans started breeding and raising small animals, such as goats, sheep and pheasants, for food. In order to tame an animal, an accurate understanding of the mammalian reproductive process is required. The practice of agriculture was accompanied by new social institutions of the division of labour, ownership and rewards for the cultivator, and the distribution and storage of the product.

Infant care

Reproduction is the fundamental, essential and indispensable function of a species. Following birth, this is the act of feeding, protecting and training the offspring by the mother. If the species is a social mammal, the maternal duties take place within the territory, economy and other organized activities of the group.

In chimpanzee society, the basic unit of infant care is the mother-offspring pair. Protection, food-sharing and transmission of culture are provided by members (males, females, siblings, playmates) of the group, in addition to the care of the mother.

In human society, the fundamental unit of child-rearing is the family, which includes the child's father who is the man who contributed the sperm which resulted in the conception, gestation and birth of the child.

What makes humans unique as a species? Is it bipedalism, shaped stone tools, use of fire, adaptation to novel ecological niches, or language? No, it is knowledge of our own reproductive process and the male role in that process. The family – the pair-bond of a man and a woman plus their children – is a unique human institution and it sets us apart from the other apes and all other mammals. Only humans, because of intelligence and curiosity, have awareness and understanding of the facts of life.

Changes in behaviour

Female sexual behaviour changed in biological adaptation and cultural innovation. Ovulation ceased to stimulate genital swelling and the signalling of receptivity. Lactation ceased to control ovulation while pregnancy continued to do so. A wife's sexual receptivity became continuous and was culturally determined, but she retained her right to timely consent or denial.

The visual stimulation of the hormones, libido, and sex drive of a husband by his wife's appearance and receptivity results in an erection. The repertoire of signals came to include caressing, kissing, flirting, flushing, smelling, touching, verbalizing, vocalizing, and other sensual aspects of sexual foreplay. Adultery, affection, barren woman, beauty, chastity, chivalry, clothing, consort, courtship, cuckold, divorce, fidelity, gallantry, homosexual, honour, intimacy, lesbian, love, modesty, old maid, polygamy, privacy, promiscuity, rape, seduction, sexiness, virginity, widow, and other cultural terms entered the lexicon to describe sexual status and behaviour. Arising from marriage were questions of adolescence, adulthood, age of consent, cohabitation, custom, incest, inheritance, law, ownership, property, punishment, and residence.

The emotional relationships that developed between husband and wife, and father and child, were imitations of the feelings and functions of the relationship of mother and child. The acceptance, affection, attachment, care, dependence, education, empathy, intimacy, love nurturing, protection, and training of the maternal connection were transferred to the marital and paternal connections.

Transmission of culture

Alternative hypotheses of transmission of cultural innovation:

- 1) Parenting
- 2) Expansion and colonization of groups into uninhabited, adjacent watersheds
- 3) Exchange of knowledge between neighbouring groups
- 4) Independent discoveries in widely separated locations
- 5) Movement of people to inhabited areas by invasion, conquest, colonization
- 6) Movement of people to uninhabited islands and continents.

Opportunism

In a social group where there is competition for individual status, the most successful are the opportunists. An opportunist is one who accepts the social system for what it is, who understands how it works, who desires the rewards that are on offer, and who is willing to use pretense and deception if necessary. It does not matter if the system is primitive, tribal, feudal, capitalist, bureaucratic, totalitarian, or democratic, the opportunist will thrive and his mastery of the behaviours, customs, attitudes, and beliefs of the ruling class will enable him to rise in the hierarchy to his maximum potential.

World of spirits

The world of spirits is a hypothesis about the unknown. An animal's experience of nature tells it that every phenomenon has a cause. Anything that a human can imagine, even a delusion, can

become a belief, if it is a plausible explanation of an event with a cause that the human is ignorant of.

The meaning of evolution

Evolution is a biological term that was first applied to the process of speciation. The formation of a new species of animal was the result of natural selection, mutation, and the transmission of preserved, favourable characteristics to individuals over millions of years. It was a process of genetics, biochemistry, and sexual reproduction, that was entirely unconscious, random, by trial and error at the molecular scale.

The word “evolution” also means history or development, when applied to humans over the short-term period. It is the consequence of behavioural change, and adaptation, a re-arrangement of sequences of genes, activation of unused genes, that a species is pre-adapted to.

Conclusion

Humans are the only animal that consciously self breeds. We have tamed and domesticated ourselves. Other species of wild animal still evolve according to the mechanism of natural selection but we practice artificial selection. A chimpanzee knows who his mother is, but does he know his father? Does a chimpanzee know that birth is the result of an act of sexual intercourse that occurred many months before? A correct understanding of the reproductive process is what makes us unique.

The discovery of paternity is a cultural development that changed our history profoundly. Our previous sexual behaviour was probably similar to that of chimpanzees and bonobos. They mate promiscuously, in an all-with-all fashion within the group, and a male cannot be aware of "my son" or "my daughter" in the way a female does. True knowledge of reproduction led to the desire by men to have their "own" children and this wish was institutionalized by means of monogamous marriage and the family. The only way to ensure that a woman gave birth to "your" child was to prevent her from mating with any other man. The institution of marriage also ensured, in a socially just way, that every man had the opportunity to be a father.

The archaeological record and genetic theory suggest that it was controlled breeding that led to the evolution of homo sapiens. The strongest, smartest, bravest men have first choice of the healthiest, highest-status women. Cultural evolution became dominant over natural evolution in human society in the accelerating pattern prevalent today. About one hundred thousand years ago, a very intelligent ancestor realized how reproduction works and was able to lead his or her fellows to change their sexual behaviour to the current practices. This cultural innovation eventually spread to all human populations.

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