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Review

Origin of the Human Family

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There are more than 300 species of primates, including human beings, on earth. Human beings share various characteristics such as morphology, physiology, ethology, and sociology with other primates. Primates have a common ancestor, and so a common evolutionary history. Various social units formed in primate societies exhibit a range of behaviors including monogamy, polygyny, polyandry, and multi-male/multi-female relations. Among all primates, however, only humans have a social ''family'' unit. The family is defined as a small-scale kin group consisting of a husband, a wife, and a child. This is the smallest social unit in human society, and it is found in almost all human societies. How would this social unit, unique to humans, have been formed? Johanson and White (1976) discovered the fossilized remains of *Australopithecus afarensis*, the Hominidae, who lived 3.75 million years ago, in Hadar, Ethiopia. These fossils were found to be a lineal ancestor to the human race, and were named the ''first family,'' because the fossils of 13 individuals (both sexes, including children) were excavated from the same ruins. However, the first family's behaviors and societies were not fossilized. Development of the family unit was a dynamic process, and therefore it is only speculation that human evolution resulted from a group of close relatives who had in turn evolved from a common ancestor. Imanishi (1951) identified four conditions necessary to a human family as being: 1. a taboo against incest, 2. exogamy, 3. community, and 4. the division of labor. I would like to discuss the origins of human society by comparing our closest relatives, the society of apes, to the four conditions Imanishi described as necessary to a human family.

Key words: human family, apes, social unit, patrilineal social structure

Introduction

We sometimes use the phrase ''family'' to describe animal aggregations. In zoology, however, there is a term for each animal group, such as ''pride'' for lions, and ''herd'' for giraffes. Groups of Japanese macaques, a primate that is closely related to humans, are called ''troops,'' and chimpanzees living in social groups are called are called ''unit-groups'' or ''communities.'' [Note that this usage of ''community'' differs from that used by some Western researchers who have used it synonymously with ''unit-group.''] These unit-groups or communities are a basic social unit of the primate ''specia''. The ''specia'' is a sociological entity corresponding to the biological species, and refers to the ''society of the species'' of ''species synusia'' (1). Therefore, the term ''family'' describes only human social units, and is understood to exist in the whole of human society.

The Hominidae fossils of 3.75 million years ago—thought to be a direct ancestor of humans—were excavated by American anthropologists Johanson and White, in the Hadar ruins, Ethiopia, in 1974 (2). This fossil was given the scientific name *Australopithecus afarensis*, and was called the first ''family'' of man by Johanson, because the fossils they excavated from these ruins included 13 persons including males, females, and children (3). In 1978, an English anthropologist found bipedal hominid footprint fossils in a stratum dating back 3.6 million years at Laetoli ruins, Tanzania (4). This fossil was also *Australopithecus afarensis*, and was presumed to represent a family of three—a man and a woman with a child—because there were three sizes of footprints—26 cm, 21 cm and 18 cm—walking in the same direction. This evidence suggests that the social unit we know as family had already been formed in the early days of human history.

Social units and life-styles, however, are not left behind as fossils. In this review, I would like to speculate on the role played by the ecology, behavior, and society of the apes, man's closest relative, in advancing the process that led to the birth of the human family.

Conditions that Define the Human Family

Primate groups form through a repetitive process of group dissolution and monogamous pairings (5), and subsequently form new social groups, after which this process repeats itself. Imanishi (6) identified four condi-

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tions necessary to meet the definition of a human family from the standpoint of cultural anthropology as follows: 1. a taboo against incest, 2. exogamy, 3. community, and 4. the division of labor. A taboo against incest is an accepted institution and custom of human society, but it should be expressed as ''incest avoidance'' for the non-human primate. Exogamy is described as obtaining mates from outside the group. Community is described as a kind of regional society linking several social units together through neighborhood relationships. A division of labor describes the roles and responsibilities of each of the two sexes.

Kawai (1992) later proposed a fifth requirement for human families, namely, ''it is an approved continuous and stable relation between a specific male and female in the society,'' in addition to Imanishi's prerequisites for a human family (7). These conditions are clear for monogamous groups. In the multi-male/multi-female groups that occur in various primate societies, individual males are linked with individual females in monogamous relationships, and these relationships have to be tolerated by other members of the group. I propose the above-mentioned conditions as a paradigm to consider 'family' of human society, and discuss these conditions with regard to human and ape societies.

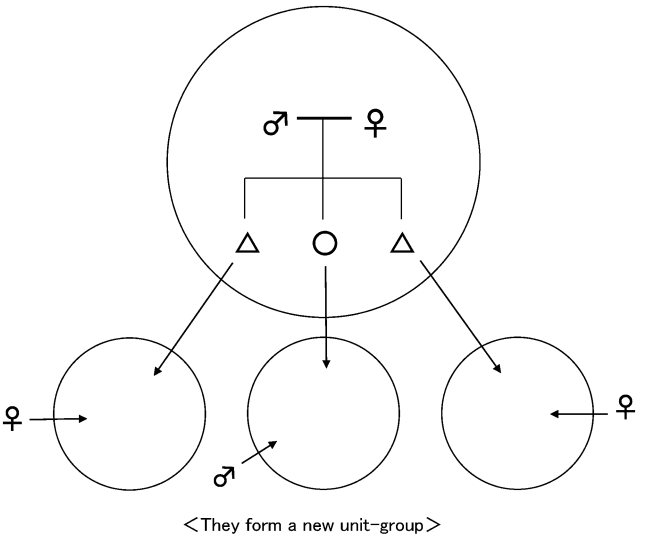

Fig. 1. The social structure of gibbons (monogamous). All offspring of both sexes depart from the natal group upon reaching sexual maturity. And since entry a unit-group is not permitted the pair composition is maintained. Since both the male and female individuals that have departed from a unit-group can not enter another, they must form a new unit-group with another individual of the opposite sex that has also departed from its unit-group. This ''specia'' (=''society of the species'' or ''species synusia'') does not have trans-generational continuity. △: male offspring, ○: female offspring.

Gibbon Model Theory

In the 1930s, howling monkeys and spider monkeys were discovered in South America, and gibbons were first identified in Southeast Asia (8–10). On the basis of this research, Imanishi proposed a theory that raised the question of whether the social lives of gibbons could be compared to those of a primitive human family (5). Namely, could the group's dissolution have led to the monogamous relationships of gibbons, through the polyandrous societies (multi-male/one-female composition) of howling monkeys, and then to the polygynous (one-male/multi-female composition) relations of spider monkeys?

In the gibbon society, all offspring of both sexes depart from the natal group upon reaching sexual maturity (Fig. 1). Since entry into a unit-group is not permitted, and neither the males nor the females that have emigrated from a unit-group are able to enter another unit-group, their society does not have trans-generational continuity. The gibbons' unit-group is territorial, and does not welcome members from other groups. Therefore, Imanishi's conditions of ''community'' and ''division of labor'' are not recognized in the society of gibbons, and this theory clearly fails.

Gorilla Model (Kindred-Family Theory)

The social units of gorillas became clear after the 1960's (11–13; Fig. 2). Imanishi proposed the ''kindred-family'' theory with the society of gorillas as a model (6). Usually, the unit-group of gorillas is composed of one-male/multi-female (polygynous) members. A few examples of gorilla unit-groups, however, have been comprised of a large group of 30–40 individuals, including three to four males. Imanishi concluded that the large group was comprised of more than two unit-groups, because each male had females of his own within the group. He considered, therefore, that there were no antagonistic relations between unit-groups of gorillas, and they were established ''communities,'' ''avoided incest,'' and practiced ''exogamy,'' because males emigrated from the natal group. Furthermore, one male was the patriarch, because polygamy was part of the social structure, and a ''division of labor'' occurred as the males assumed responsibilities associated with fatherhood.

According to reliable long-term research conducted subsequently, however, it was shown that the large group of gorillas was not a gathering of multiple unit-groups (14–18). Only one male in each unit-group behaved like the patriarch, and the other males were his sons. Although it was possible for a son to inherit his father's group, most males left the natal group, and the gorilla group's fundamental structure continued only during the lifetime of the patriarch-like male, and had no trans-generational continuity. On the other hand, relations between gorilla unit-groups were antagonistic, and they did not reflect an established ''community.''

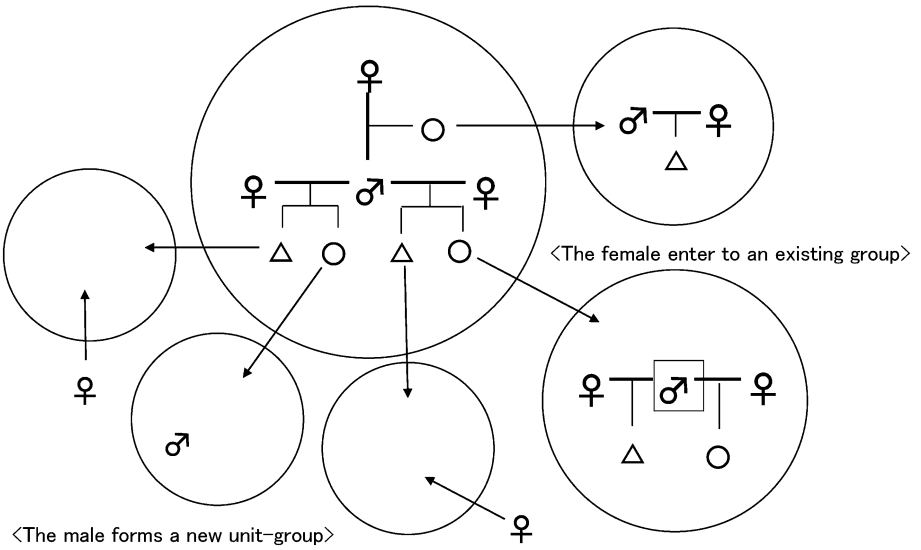

Fig. 2. The social structure of gorillas (polygynous). All offspring of both sexes depart from the natal group upon reaching sexual maturity, but males can not enter to other groups. The composition is one-male/multi-female, and the male which has departed from his natal group forms a new unit-group. Females join to a new unit-group or enter to an existing other group. This ''specia'' does not have trans-generational continuity. △: male offspring, ○: female offspring.

Imanishi's ''kindred-family theory'' also failed.

Pre-band Theory

Chimpanzees have multi-male/multi-female unit-groups (Fig. 3). Only females migrate between unit-groups, and males do not leave the natal group (19,20). The structure is thus perpetuated by the preservation of patrilineally linked males (21). However, a central male coalition was discovered among the chimpanzees (22).

The ''band'' was a group of hunter-gatherers composed of multi-families totaling 30–100 people (23, Fig. 4). They travelled seasonally, in order to hunt and gather various natural resources like animals and plants in the forest. The band's composition changed over time, with new members joining the band and former family members leaving.

Based on these studies, Itani proposed the ''pre-band theory,'' to help explain the origin of the human family (24). ''Pre-band'' describes a form of human society that existed prior to the formation of bands. This theory suggests that the unit-groups of chimpanzees and bands of hunter-gatherers were social units of homophyly, and a difference between them was that the unit-group of chimpanzees was not organized like a family, while a unit-group of hunter-gatherers was comprised of families. In other words, the family was a man's basic social unit and a band was comprised of family units.

An important point in the pre-band theory was the monopoly on consort relations. In the patrilineal social structure of chimpanzees, there was every possibility of making a family if males could have the consort-ship with specific females who had immigrated from other

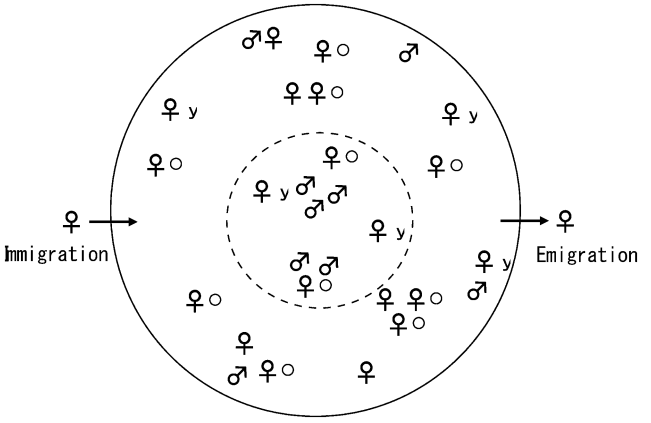

Fig. 3. The social structure of chimpanzees (patrilineal). The composition of unit-group is multi-male/multi-female. Only females migrate between unit-groups, and males do not depart from the natal group. The ''specia'' thus perpetuated by the preservation of patrilineally linked males. The fission and fusion of unstable memberships is repeated within a unit-group. A ''core'' of the unit-group is possessed by males. A dotted circle indicates a ''core'' within the unit-group, ♀ ○: female with offspring, ♀ y: adolescent female.

unit-groups. One male chimpanzee in Tanzania's Gombe National Park mated with a female and they remained monogamous for a long period (25,26). The same observation was made of chimpanzees in the Mahale Mountains National Park, Tanzania (27). For the chimpanzee society, however, it was not possible to confirm a tolerance for males having multiple relations. Dominant males attacked and disturbed subordinate males when they were about to copulate with females. In some cases reported from the Gombe and Mahale

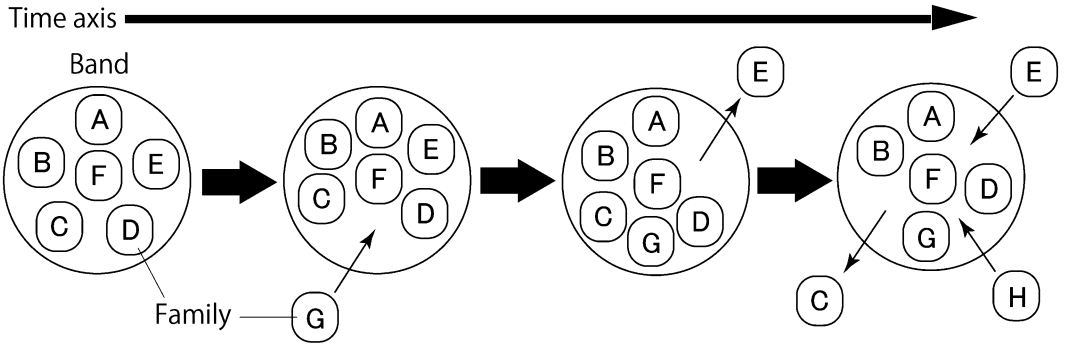

Fig. 4. The structure of band on the hunter-gatherer peoples. The band is composed some families and the composition changes with time.

National Park, it appeared that subordinate males disappeared briefly with a female in order to avoid being disturbed by other males.

Chimpanzees demonstrated the characteristics of ''incest avoidance'' and ''exogamy,'' as evidenced by the migration of females between unit-groups. Furthermore, the behaviors indicating that there was a ''division of labor'' between the sexes was also observed, since males conducted the hunting and dealt with external conflicts, while females gathered and shared food and childcare responsibilities. However, relationships between chimpanzee unit-groups were usually antagonistic, and the antagonisms sometimes extended into intra-specific killings (19,28). As a result, chimpanzee sub-units have not achieved the level of ''community,'' even though some chimpanzees are highly sociable. As Itani pointed out, when considering the criteria required to create a human family, the one of ''community'' on Imanishi's list of conditions became a big obstacle.

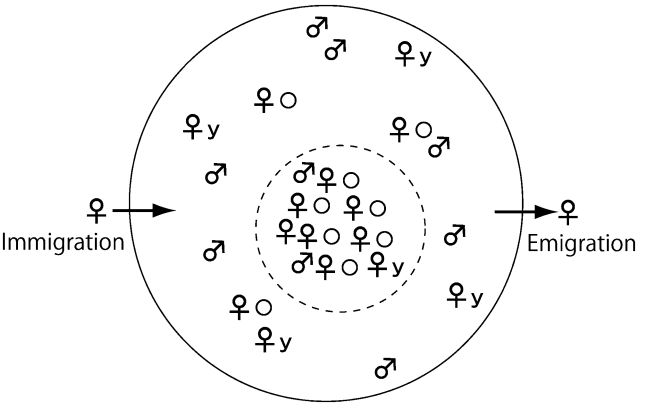

Fig. 5. The social structure of bonobos (patrilineal). The unit-group of bonobos is also multi-male/multi-female and patrilineal society. Although the bonobo exhibits a fission and fusion pattern of grouping like that of the chimpanzee, its unit-group does not frequently split into small fragments, but maintains lager-sized parties (temporary groups formed within unit-groups) than those of chimpanzees, and bonobo females are in a ''core'' of the unit-group. A dotted circle indicates a ''core'' within the unit-group, ♀○: female with offspring, ♀y: adolescent female.

Relations between Unit-groups of Bonobos

The bonobo—called ''the last ape''—was discovered in the 1920s. Bonobo studies were initiated by Kano in 1973 (29). Since that time, it has been learned that bonobos also have a patrilineal social structure (Fig. 5), as do chimpanzees (see Fig. 3). The mechanisms for maintaining trans-generational continuity were the same in both species, although in the bonobo sub-groups kin-related males maintained close mother-son relationships (30,31). Bonobo females aggregate in the unit-groups, adult males often have strong bonds with their mothers, and both sexes engage in a range of sexual behaviors (32). In the early studies of bonobos, their inter-group relationships were also thought to be antagonistic, similar to other primates.

However, Idani observed in 1986 that members of two bonobo unit-groups were intermingling frequently (33). During such encounters various affinitive behaviors, such as genito-genital rubbing by females, copulation, males bumping rumps, peering, social grooming, and social play were observed between members of different unit-groups. Affinitive interactions between females of different unit-groups were particularly frequent, and appeared to ease tensions caused by the encounters. Although males interacted with members of different unit-groups much less frequently than females, aggressive interactions between members of different unit-groups were rare. Furthermore, young nulliparous females were observed moving between unit-groups during these encounters.

Previous reports (e.g., 34) assumed the existence of some kind of dominant-subordinate relationship between unit-groups, as reported for chimpanzees (19,28). In Idani's studies, however, such relationships were not observed. One group was not seen to be avoiding the other at the time of inter-group approaches, and two unit-groups preferred to have encounters after making auditory contact. They did not reveal a dominant-

subordinate relationship between the unit-groups. In other words, members of each group associated on equal terms during encounters. This lack of a clear dominance relationship, as well as the females' peaceful behaviors, was an important factor in enhancing unit-group fusion. The bonobos fostered peaceful social relationships between different unit-groups.

A Bonobo Model as the Human Family

As already stated, the bonobos have a patrilineal society in which females migrate between unit-groups, and males do not leave the natal group. ''Incest'' is avoided by the females' migrating behaviors, thereby practicing ''exogamy.'' A ''division of labor'' is established through food sharing and various social interactions among members of the unit-group, and various sexual behaviors suggest the separation of ''sex'' and ''reproduction'' (32).

In other African societies of great apes—other than bonobos—only antagonistic relationships have been reported between unit-groups (15,19,28,35). Although the structure of the assumed ''community'' above the unit-group level in bonobos has not been fully revealed, their neighborhood relationships, which allow the peaceful coexistence of two unit-groups, provide a non-human primate community model that is close to Imanishi's model of a human society.

Here I would like to make an important point pertinent to the origin of the human family. After adolescent female bonobos moved to several unit-groups, they belonged to the unit-group where they had their first offspring (36). Immigrant females interacted with all the unit-group's resident females after the immigration. Sometime later, each immigrant selected one particular resident female, a 'specific senior female' (SSF), and approached and followed her (37). Thereafter, affinitive behaviors (e.g., grooming, genito-genital rubbing) were frequently performed between the immigrant and her SSF.

On the other hand, SSFs usually have sons, and sons rely heavily on their mothers. Consequently, it was easy for immigrant females to have affinitive relations with SSF's sons. Although SSF's sons copulated with immigrant females, other males did not interrupt them during copulation, and they performed copulations with greater frequency than did other pairs, and consequently immigrant females soon gave birth. During this time, if SSF's son and immigrant female were linked in a continuous relationship, and the relationship was tolerated by other members, bonobo society also satisfied Kawai's fifth condition. When there was a strong affinity between the SSF, her son, and an immigrant female, and other members of the sub-unit approved the relations, there was the possibility that this group would form a social unit, which could be described as a ''family'' (Fig. 6).

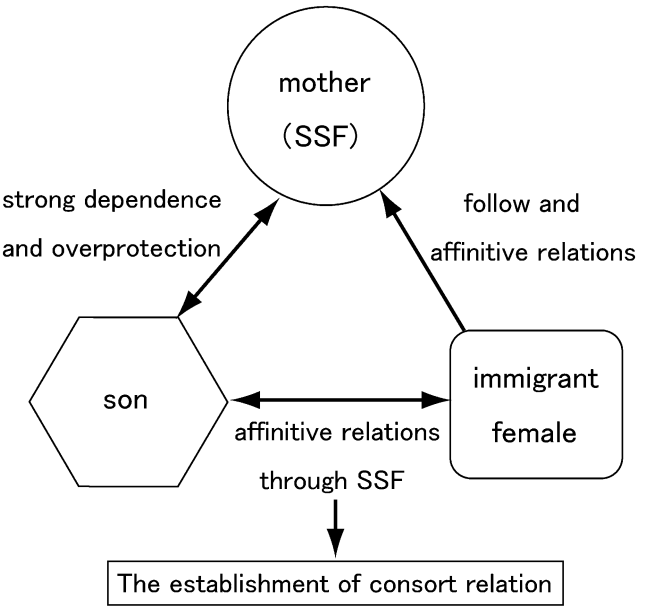

Fig. 6. A bonobo model as the human family.

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