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Nests: Living Artefacts of Recent Apes?¹

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According to Sept (1992:190), "there is no ethnoarchaeological record of apes that links their foraging, tool-making, or sleeping behaviors to corresponding patterns of debris; . . . consequently their debris patterns have not been studied." (Not considered in this assessment are the wooden clubs and stones used by some chimpanzee populations to crack hard-shelled nuts [Rahm 1971, Struhsaker and Hunkeler 1971, Boesch and Boesch 1983], which with a few exceptions [Kortlandt 1986; Falquet 1989; Joulian, personal communication] have received little attention from palaeoanthropologists.) Sept suggests that nesting sites as ephemeral debris produced by apes would be valuable for palaeoanthropological research. On the basis of a brief study of chimpanzee nest distribution at Ishasha in Zaire, she has proposed a new referential model for approaching the process of early archaeological site formation. She hypothesizes that spatial concentrations of chimpanzee nests may accumulate over years through independent episodes of this behavior. One way to test this hypothesis is to investigate long-term individual ranging patterns.

Since archaeologists are used to dealing with time spans covering millions of years, chimpanzee nests, with recorded mean life-spans of at most 113.6 days (table 1), have understandably been viewed as ephemeral. We have found, however, that debris from nest building lasts much longer than days or weeks. In a 24-month study (1990-93) of nest building by free-living bonobos (*Pan paniscus*) conducted at Lomako in Zaire, besides ecological and ethological measurements of nests in general (Fruth and Hohmann 1993, n.d.) we undertook a detailed description of individual nests. Twenty-four fresh nests were closely examined by climbing up into the trees and whenever possible disassembled and their physical dimensions (e.g., number and diameter of bent,

TABLE I
Life-span in Days of Chimpanzee Nests

Mean	Range	n	Site	Reference
113.6	35-151	49	Lopé, Gabon	Tutin and Fernandez (1984)
110.8	15-202	29	Kibale, Uganda	Ghiglieri (1979)
73.3	7-290	26	Tai, Ivory Coast	Fruth (1990)
54.6	14-112	49	Ishasha, Zaire	Sept (1992)

broken, supporting, and padding branches) measured. While up in the canopy at nest level, we observed aberrantly growing branches. These first came to our attention when we were disassembling a nest constructed at the end of a side branch of a *Polyalthia suaveolans*. At the base of the nest we found previously broken but completely recovered branches in the shape of the typical triangular frame of a nest. Similar structures soon became apparent in every group of nests. We distinguished several forms: (1) broken but healed and continuing growth in a new direction, (2) dead at the site of fracture with a young shoot perpendicular to the branch, either vertical or horizontal in relation to the living part, and (3) a combination of the two.

Chimpanzees and bonobos are highly selective of tree species for nest construction (Bournonville 1967, Kano 1983). Only 30% (24) of the 80 tree species potentially available were chosen for nest construction in Lomako, and 61.4% of the trees used for nest construction (1,052) were from just 5. Our observations show that besides leaf size and seasonal variation, the quality of the wood and its flexibility and strength may be important criteria for tree choice. Bonobos need branches flexible enough to be bent but rigid enough to be partly broken; in the simple triangular form of a bonobo nest base, the broken branch remains at least partially connected, thus presumably continuing to obtain enough water and nutrients to recover. New bark covers and heals the split and the branch continues to grow. The deformed angle of the break persists long after the other parts of the nest have disappeared. We saw such deformities even in the lowest parts of tree crowns; these sites must have served as nest bases some 50 years ago.

The mean number of branches broken to make a nest was 6.3 (range = 1-14; s.d. = 3.9; n = 18). In 42.5% of the cases the diameter of the broken branch was less than 1 cm; 39.8% had diameters of 1-2 cm, and 17.7% had diameters of 2 cm or more. To estimate the rate of woody regeneration at Lomako, we measured 111 small trees (average diameter = 17.5 cm; range = 0.5-6.3 cm; s.d. = 10.8) that we had broken or cut along a 200-m transect. Of these, 62.2% had been cut three years, 23.4% two years, and 14.4% one year before. In 97% of the cases young shoots had sprouted near the damaged part, and in 38.7% of the cases the injured part had healed. This high rate of regeneration became even more apparent when we considered only the parts that had

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been broken but not detached. In 54.6% of the cases these had been covered by new bark growing into the area of the break. This does not mean that more than half of the trees used for nests will similarly recover. First, for saplings that are broken regeneration is a question of survival; a grown tree will not be seriously injured by having some of its branches broken. Second, almost all of the nests built by a bonobo in its life-span will have a high proportion of bent rather than broken branches. Finally, the rate of regeneration may be influenced by climate, trees more often regenerating in forested than in savannah habitats.

Assuming a life-span of 35 years and the construction of about 1.5 nests per day, including day nests, a bonobo probably builds about 19,000 nests during its lifetime. Thus we should be able to find enough remains within a community's range to determine whether there are accumulated concentrations of nests. Systematic analyses are necessary to date these structures and to estimate the rate of regeneration of the trees. Over three years we found regular reuse of the same nest sites and trees and sometimes even of the same positions within a tree. It may be that bonobos (and perhaps all the great apes) inadvertently alter their favorite trees in such a way as to create branch structures prefabricated for future nest construction. Close observation of these remains over the life of a tree should allow (1) the confirmation of ancient chimpanzee presence, especially in areas where they may have long since become extinct (e.g., Burkina Faso, Togo, Benin), (2) the compilation of evidence for reuse of nest locations, allowing nests to be judged as "the cumulative products of behavioral events that were spaced through time" (Kroll and Isaac 1984:13), and (3) the determination by dendrochronological methods of the year of an independent nesting event.

At Lomako 1,207 nests have been marked on the adjacent trunk, and their positions in the trees have been measured in relation to a defined origin. Up in the canopy we have begun to mark the freshly broken branches directly. Once the results of our analyses are available, it will be possible to identify spatiotemporal concentrations of nests without investing decades of study in the accumulation of year-round records of bonobos' ranging patterns.

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Explaining the Level of Bridewealth¹

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Explaining the level of bridewealth in a given society is not the anthropologist's usual preoccupation. It is usually sufficient to note the existence of bridewealth, its form, characteristics, and the social processes associated with it and hope to have gotten the facts straight. There are, however, occasions on which differences in the amount of bridewealth paid (Gluckman 1950, Schneider 1964, Borgerhoff Mulder 1988) or a shift from bridewealth to dowry (Sharma 1980, Epstein 1973) lead to speculation on the factors that affect the level of bridewealth.

There is general agreement that women provide a net benefit to the groups that receive them in marriage and that this net benefit justifies or explains the existence of bridewealth. This point seems almost obvious, given that women are valuable and that the transfer of goods to acquire women implies a preference for women relative to those goods. The logic of everyday economic rationality offers no alternative to the consideration of

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