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We welcome Rose and Marshall's refocusing of attention on the likelihood of Plio/Pleistocene home bases and applaud their use of knowledge of living nonhuman primates, on the assumption that the intellectual capacities of early hominids were at least equal to those of living great apes. There are even more data than those cited from field studies that buttress many points in their case, especially with regard to bonobos (*Pan paniscus*).

Throughout, they refer to the relative safety of key defensible sites from competing or predatory carnivores, without always making explicit what these were. On the basis of what we know of the natural history of the four species of living great apes (*Gorilla gorilla*, *P. paniscus*, *P. troglodytes*, *Pongo pygmaeus*), it seems likely that the single most important factor in the adaptive package was the arboreal, constructed platform. (These are usually termed nests, although this is a misleading and insufficient label however well-entrenched by traditional usage.) Apart from daily resting by day and sleeping by night, such elementary dwellings are also used by apes for socialising, eating, sex, birthing, and dying. When built only a few meters above the ground, they are secure de facto from two of the three families of relevant carnivores: the nonclimbing Canidae and Hyaenidae. For security from these threats, the only defensive strategy required is high-enough siting of the platform. For at least some of the large Felidae, additional measures are required, but only one species, *Panthera pardus*, the leopard, is really a threat above the ground. (Lions, *P. leo*, rarely venture above a few meters' height, and then only cautiously, on major boughs.) Because leopards are solitary, they can be effectively mobbed by groups of apes, even on the ground, where they are faster afoot than a hominoid (Boesch 1991). It is hard to imagine a leopard bringing down an arboreal ape, especially in terminal branches or in canopy containing lianas, where the quadrumanous hominoid will always have the evasive advantage. But what of the sleeping ape at night? All that is needed is appropriate trees. Emergents with upright trunks of sufficient girth that their canopies cannot be entered by ascent or from neighboring trees are one example for a safe solution. Such trees, for example, *Ceiba pentandra*, tend to be concentrated along watercourses, even in savannahs, where they contribute to gallery forests.

As Rose and Marshall note, what is largely missing in nonhuman primates is transport to and therefore delayed consumption of resources in a secure central place. A quadruped lacking the technology of the container simply has no means of energetically feasible transport of many accumulated small items. A first step in this

direction may be when bonobos go temporarily bipedal to carry armfuls of mango-sized *Irvingia* or *Austranella* fruit for distances of tens of meters, to be consumed at a more private spot somewhere on the ground. A next step and at the same time the closest approximation, however, may be when a bonobo transports tripedally by means of the mouth and one arm a large food item such as an adult duiker carcass (*Cephalophus* sp.) or a *Treculia africana* fruit, both about 10 kg in weight, for hundreds of meters. The goal of transport may indeed be a place of shelter: bonobos occasionally happen to transport these items to their nests, where the defensible but divisible resource is shared and consumed at leisure. Nest sites are reused regularly and can be traced back at least some decades by means of deformed, broken and rehealed branches. When food remains or other debris have long since decomposed, these witnesses of the past persist and provide a sign of intended and repeated environmental alteration by hominoids (Fruth and Hohmann 1994).

Contrary to Rose and Marshall's claims, the sharing of plant foods by living hominoids is far more common than of animal foods. Invertebrates such as ants or termites are often eaten but never shared, and vertebrates are widely shared but rarely caught. Sharing of plant food occurs routinely, mostly from mother to unweaned offspring, in the form of tolerated scrounging. Infants repeatedly take fruit or nuts from their mothers' hands or mouths. As Rose and Marshall note, what is notably absent in any hominoid is male provisioning of mothers and young; instead male chimpanzees apparently share meat with females more as a courtship strategy than as a parental strategy (Stanford 1995). Again, bonobos add more to the better-known picture from chimpanzees. Females control access to meat and large but divisible fruit such as *T. africana* and distribute it within their social network (Hohmann and Fruth 1993). Thus they make us further reconsider the already disputed and simplistic picture of man the hunter versus woman the gatherer.

Rose and Marshall suggest that the gist of defensive social strategies against predators, as practised by living primates, is social cohesion plus cooperation. If by this they mean larger-sized groups containing more males (e.g., Anderson 1986) who mob solitary predators, then fair enough. (This, however, is widely found in social birds and mammals and thus *not* unique to hominoids.) We agree that early hominids likely enhanced this strategy, building on the propensity of apes to use objects in display or as weapons. Such behavioural defences are facilitated by bipedal stance, especially in powerful, accurate, overarm throwing of missiles. However, the more notable cooperative advance by hominids was likely division of labour, wherein some members of the party hauled the meat while others used weaponry to keep competing or predatory carnivores at bay. Such division of labour is largely absent, as in the lack of exchange of gathered for hunted proceeds of foraging, but could be built on the basis of division of labour in hunting as practised by chimpanzees (Boesch and Boesch 1989).

Thus, in this "tree-house" model, we envision Plio/Pleistocene hominids who retained sufficient climbing ability, at least equal to that of anatomically modern *Homo sapiens*, to elevate themselves about carnivorous competitors and predators. With simple arboreal platforms on which resources and weapons could be placed, they could relax by day or night and engage in a wide range of sedentary activities. Archaeologically, the platforms and their supporting trees are invisible, having long since perished, depositing their preservable contents on the ground below amidst the scatter of refuse, creating a hodgepodge living floor. The most likely test of these ideas, however, is palaeoecological, as one would expect such home sites to be found where such particular trees grow.

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Rose and Marshall have done a thorough job in reviewing and reevaluating the evidence for and against the home base as a temporary camp or focal point for subsistence and familial social activities. They provide a convincing argument for the reinstatement of the hominid home base as a focal site of diurnal and/or nocturnal occupation but disagree with the proposition that this should suggest that hominids were monogamous and practiced sexual division of labor.

Their presentation of new archaeological and ethnological evidence persuasively dispels many of the later claims made about site formation and hominid-carnivore interactions that were responsible for the widespread abandonment of the home-base theory in the 1980s. They argue that rather than hindering the establishment of focal sites of activity as the revisionists suggested such pressures could have been the driving forces for the elaboration of existing trends in primate behavior that encouraged such traits as cooperative resource defense and sharing. This point is well taken.

One more major factor which makes this paper work is the use of nonhuman primate studies as a reference point for interpreting hominid behavior. The use of nonhuman primates as both homologous and analogous reference points for interpreting the behavior of early hominids is based on firm ground (McGrew 1992b, Sept 1992), and Rose and Marshall have used both succinctly to make their case. Observations from extant nonhuman primates can contribute meaningful, sometimes quite unexpected insights (Quiatt and Huffman 1993) about the interpretation of the fossil record.

There is an inherent danger in drawing conclusions from the archaeological evidence about complex behavioral organization such as mating systems or cooperative behavior. At this stage, it certainly seems to make more sense to model hominids' behavior after that of their phylogenetic ancestors rather than after that of contemporary human hunter-gatherers. Rose and Marshall bring this point home and provide a more realistic set of ex-

pectations but no clear answers for what can be interpreted from the archaeological record on the basis of the nonhuman primatological data.

Rose and Marshall argue that the fixed and defensible resources of water and plant food formed the focus of activity at which an easily transportable, high-quality source of food could be defended. With the exception of transporting large amounts of meat, this pattern could fit a number of extant nonhuman primate species. This in itself I find comforting and quite reasonable in that it does not attempt to separate these early hominids from their simian (and mammalian) roots. This is a trap easily fallen into in a science that has too often placed humankind on a pedestal above even its closest living primate relatives.

We will probably never fully understand the function and significance of the home base among early hominids because we cannot reconstruct their behavior from the fossil record. Rose and Marshall have, however, provided us with a useful tool for reevaluation of the evidence that can help us come to a closer, more reasonable approximation.

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Some of us responsible for the 1980s critique of the home-base hypothesis aimed to synthesize data from the fossil record and modern behavioral ecology (see Potts 1982, 1987b). Rose and Marshall appear to develop this approach and, in the process, provide a concise review of primate group defense in the face of predation risk. Their arguments in favor of early home bases, however, are not backed by any new archaeological data, analyses of old data, or adequate consideration of proxies of hominid-carnivore overlap at specific prehistoric sites. Their resource-defense model rests, instead, on the assertion "that hominids were subject to the same types of ecological pressures, particularly predation risk and resource competition, as other primates" and "that Plio/Pleistocene hominids . . . may not have been exposed to substantially higher predation risk than are some extant nonhuman primates."

The archaeological data contradicting these assertions are from Olduvai Bed I and were once considered the best examples of early campsites: (1) The bone assemblages from four "primarily hominid" sites show abundant carnivore damage (e.g., tooth grooves, punctures, shaft cylinders), which indicate that large and small carnivores were also active at the sites. (2) Evidence from these sites shows that carnivores had access not just to long bone ends (left over when humans take the meat and shaft marrow) but also to meat and marrow left unprocessed by hominids. Carnivore tooth marks occur on the shafts of meaty limb bones (femur, humerus); complete meat- and marrow-rich bones are present at each site despite feeding by both hominids and carnivores;