Book Reviews

Quantitative Sociobiology

The Siamang in Malaya. A Field Study of a Primate in Tropical Rain Forest. DAVID JOHN CHIVERS. Karger, Basel, 1974. xiv, 336 pp., illus. Paper, $62.75. Contributions to Primatology, vol. 4.

Social Dynamics of Gelada Baboons. ROBIN DUNBAR and PATSY DUNBAR. Karger, Basel, 1975. viii, 158 pp., illus. Paper, $36. Contributions to Primatology, vol. 6.

Dominance and Reproduction in Baboons (*Papio cynocephalus*). A Quantitative Analysis. GLENN HAUSFATER. Karger, Basel, 1975. viii, 150 pp., illus. Paper, $30.50. Contributions to Primatology, vol. 7.

Contributions to Primatology is a new vehicle for the publication of monographs and symposia on primate studies. Five of the initial seven volumes emanate from the largest and most rapidly growing branch of the subject, behavioral primatology. Basically they are the doctoral theses of younger scientists. If only sales price of the Contributions is considered, all units are Mercedes-Benz. If workmanship is added the series embraces other makes.

The three volumes reviewed here evidence current concerns and trends in field studies of nonhuman primates that aim to explain aspects of their behavior and social patterning. They also document the recent transition from descriptive, impressionistic natural history to quantitative sociobiology.

Chivers worked proximally to elucidate the interface between the external environment and his subjects (*Symphalangus syndactylus*) and to provide a quantitative description of siamang socioecology. This would help to clarify the taxonomy and phylogenetic relationships of the lesser apes (Hylobatidae). Chivers states (pp. 2 and 3) that the hylobatids are especially important to physical anthropology because among apes they alone share monogamy and habitual orthogradism with man.

In pursuit of these goals Chivers conducted a preliminary 2-month study at Ulu Gombak near Kuala Lumpur, a 5-month survey in all states of West Malaysia except Perlis, and intensive observations during 17 months at two sites, Kuala Lompat in lowland dipterocarp forest and Ulu Sempam in a selectively logged hill dipterocarp forest.

From the survey, Chivers inferred the distribution and density (often assessed by calls instead of sightings) of siamang and two species of gibbon (*Hylobates lar* and *H. agilis*) in Malaya. In each month of the focal study he generally devoted periods of between 10 and 12 days to observation of a few family groups of four or five individuals (adult male and female and subadult, juvenile, and infant) at Kuala Lompat and Ulu Sempam. He also continued to monitor groups at Ulu Gombak at irregular intervals and collected botanical samples and other ecological information.

Once the subjects were habituated to his presence, Chivers usually was able to keep them in view for much of the day because of their high degree of group cohesion and small daily ranges. Thus his quantitative information on social, maintenance, and ranging behavior is quite representative and remarkably full for a tropical arboreal mammal.

Chivers confirmed observations and speculations by previous hylobatologists that siamangs live in small family groups, the integrity of which is maintained by dramatic calling, display-swinging, and occasional chasing. In addition he found that, conversely to Ellefson's prediction, siamangs occupy territories smaller than those of sympatric white-handed gibbons. Chivers relates this phenomenon to the different feeding predilections of the two species. Siamangs are much more folivorous than gibbons and they rely primarily on a few staple tree species. By contrast gibbons subsist on a wide range of foods that requires them to have somewhat more extensive territories. Chivers concludes that the diet of the siamang is less specialized than that of the gibbon (p. 293). Given the dearth of physiological information, for example, on relative ability to detoxify certain plant compounds, and our incomplete knowledge of the composition of yearly fares and the nutritional content of forest foods, this conclusion is premature and is potentially misleading when extended into taxonomic and phylogenetic inferences.

Other characteristics of siamang behavior are documented by Chivers: siamangs are exceptionally devoted to feeding (it occupies more than one-half of the daily activity period); suspensory positioning is a frequent component of feeding behavior; adult females commonly initiate entrance into and departure from sleeping trees and travel at the head of linear progressions; during travel, the adult male carries the infant from 8 to 10 months of age until its locomotive independence; and new group formation appears to be a complex process of exclusion of subadults by adult male aggression and adult female avoidance and prolonged calling by the peripheralized subadult males, which attracts subadult females.

Chivers has established a solid foundation for a long-term study of the synecology of West Malaysian primates, one that could answer many questions about the social dynamics and long-range effects of environmental perturbations on the behavior of *Symphalangus syndactylus*. The current report sheds no light on the origin and meanings of the human cultural practice of monogamy. As a physical anthropologist who favors a hylobatian (that is, small-bodied arboreal ape) model for human postural and locomotive evolution, I am disappointed by the scant quantitative and descriptive treatment of positional behavior in this monograph. It is to be hoped that future studies will provide proper data from which to evaluate Chivers's statement that siamang movements through the trees are very similar to those of chimpanzees and orangutans (p. 295).

The Dunbars aimed to describe the kinds of social groups in populations of *Theropithecus gelada*, their modes of intragroup and extragroup social communication, and the mechanisms for formation and cohesion of their one-male subgroups. Theirs was a cross-sectional study of the social dynamics and structure of numerous subjects with no detailed attention to influences of the external environment.

They censused geladas for one month near the Simien Mountains National Park in northern Ethiopia, conducted their main study in the park for eight months, and collected comparative data for five months in the Bole Valley of central Ethiopia. Habituation and visibility were not problems. Especially at Simien, the Dunbars could walk among their subjects, whose flight distances were only 3 to 5 meters. Geladas manually graze and grub among very low herbs and grasses and forage on leavings in recently harvested fields. The enormous size (about 760 animals) and density (77.6 per square kilometer) of the

Simien population and the Dunbars' perception that, unlike common baboons, gelada individuals look very much alike (p. 17) made the identification and monitoring of discrete units difficult. The Dunbars did not mark their subjects. Nevertheless, during the second half of the study at Simien, they could confidently identify all members of 12 one-male units and 1 all-male group.

The Dunbars have successfully sketched the basic social structure of *Theropithecus* and they provide considerable insight into possible cohesive mechanisms and ontogenetic transformations of their one-male (or harem) units, all-male groups, and bands. Their results also serve as a sound base for comparisons with Kummer's classic studies on *Papio hamadryas* and for testing the hypothesis that one-male units are especially adapted for arid environments.

The integrity of the one-male units is maintained to a considerable extent by female-female bonds that are reflected in (and probably reinforced by) grooming relationships and the tendency for geladas to repel strays back to their own harem units. The male is somewhat peripheral to the females of his unit and, except during their estrus, he interacts quite preferentially among them. Female geladas lead unit group movements. They also initiate transference to new units. This contrasts markedly with the androcentric pattern of *Papio hamadryas*. Herding by the male gelada is relatively uncommon (and sometimes ineffective) by comparison with that of the hamadryas baboon. The male gelada usually stares and threatens; he rarely bites his females.

On average, the largest harem units include a mid-prime and a young adult male, six adult females, and six youngsters. The next largest units contain one mid-prime male, five females, and five youngsters. Units with only young adult males or with old males are generally smaller than those with mid-prime males. As subadults, males live in all-male groups of between 3 and 13 individuals that are "led" by one young adult male. A young male may eventually acquire females by joining a harem unit in which he interacts primarily with its young juvenile females. Fission probably occurs gradually as the females become reproductively mature (p. 104). Young adult males also may attack a unit male (generally a post-prime one) and usurp his unit. The old male remains peripherally with the unit. But unlike his collateral, the hamadryas, the old male gelada does not influence the movements of the band.

The Dunbars conclude that despite superficial similarities between the structures of gelada and hamadryas social groups, the mechanisms that underlie them are radically different (p. 141). These considerations plus the fact that gelada habitat is not even seasonally arid (p. 142) cast serious doubt on the universality of Crook's explanation that in terrestrial cercopithecines one-male units were adapted for arid environments. The rapidly increasing population (the increase is estimated to be 15.7 percent per year; p. 29) at Simien indicates that food is plentiful (or at least was during the Dunbars' visit). Thus, the evolution of gelada social structure remains mistier than the Simien Mountains. The impoverishment of natural predators and encroachments by man allow little optimism that decisive answers will be forthcoming. But the Dunbars' continuing studies should rule out some of the more unlikely speculations about the behavioral evolution of *Theropithecus* and also of *Homo*, with whom it has become faddish to construct analogies.

Hausfater's is the most narrowly focused of the three studies. This might be expected since, unlike *Theropithecus* and especially *Symphalangus*, savanna *Papio* have been subjects of numerous naturalistic behavioral and laboratory physiological studies for more than 15 years. Over a 14-month period in Amboseli National Park, Kenya, Hausfater tried to determine whether the dominance rank of male baboons was related to their reproductive success. This might illuminate whether and how sexual selection is operant in the species (p. 1). Since the essence of this work was reported recently in *Science* (**191**, 55 [1976]) by G. B. Kolata, I will touch only briefly (and critically) on a few aspects of it here.

Hausfater only partly solved his proximate puzzle and failed to reveal the nature of sexual selection in savanna baboons, perhaps because the Carpenter-Altmann priority-of-access model is too simple to apply to a complexly social species like *Papio* living in a vicissitudinous habitat like Amboseli National Park. Unlike Chivers and the Dunbars, Hausfater passes over potential perturbing environmental factors that might affect the normality of his single study group. He simply states (p. 4) that during the seven years prior to his study the baboon population had reduced from 2600 to around 200 individuals and that Masai tribesmen lived and grazed their cattle within the study area. He does not mention the intensity of tourist traffic and the frequency of visits by other baboon watchers to the area. It could be that external environmental factors were overshadowing aspects of the social communicative network that might reveal sexual selection. The effects of dramatic environmental deterioration on the reproductive physiology of Amboseli baboons also remain unexplored.

Additional longitudinal studies on baboons in several different habitats are required to test Hausfater's revised hypothesis, that the relation between dominance and mating behavior holds only for short-term reproductive behavioral strategies of males, and the assumptions upon which it rests (see Kolata, p. 56). If questions about sexual selection in savanna baboons are to be pursued, a good deal more attention must be given to how females express their preferences for certain males and the morphological, physiological, and behavioral features upon which preferability is based. Observers might be wise to concentrate on a few specific subjects throughout their daily activity cycles until the subtle details of their communication are better understood.

Despite certain criticisms expressed here, I suspect that primate sociobiology might come of age soon, especially if observers like Chivers, the Dunbars, and Hausfater succeed with longitudinal extensions of their field studies. Let us hope that the *rites de passage* instigated by critics of sociobiology will speed its maturation and integration with the human sciences instead of prolonging its isolation or mutilating it.

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Observers' Report

Childhood in China. WILLIAM KESSEN, Ed. Yale University Press, New Haven, Conn., 1975. xvi, 242 pp., illus. Cloth, $12.50; paper, $3.95.

The joint Committee on Scholarly Communication with the People's Republic of China of the National Academy of Sciences, the American Council of Learned Societies, and the Social Science Research Council has been the main vehicle by which serious exchange on a scholarly and scientific level has been encouraged between China and the United States in recent years. The breadth of the Committee's activities is documented in its *China Exchange Newsletter* and the quality of its delegations and their efforts on our behalf is illustrated in the report now published as *Childhood in China.* A distinguished group—mainly psychologists, but also including sociologists, China specialists, a pediatrician, and a working nursery school