

# From Radcliffe-Brown to Sociobiology: Some Aspects of the Rise of Primatology Within Physical Anthropology

HUGH A. GILMORE

*Department of Anthropology, University of Michigan, Ann Arbor, Michigan 48109*

**KEY WORDS** Primatology, Sociobiology, Primate behavior

**ABSTRACT** The formation of the American Association of Physical Anthropologists some 50 years ago marked the official recognition of physical anthropology as a legitimate subfield of anthropology. Since then, with the growth of individual and institutional participation in the Association, and with the development of new research paradigms, a number of subspecializations have come to be accepted within the field. Perhaps none of these specializations, however, has grown as rapidly, or spectacularly, as has the subfield of primatology. This article details some of the rise of primatology as an accepted subdiscipline of physical anthropology and discusses the theoretical orientations which guided the first anthropological forays into the study of nonhuman primates.

A reliable indication of the growing acceptance of primatology as a subfield of anthropology can be gained by surveying the number of doctoral degrees granted by anthropology departments for dissertations which focused on primate research. The *Comprehensive Dissertation Index (C.D.I.)* lists and abstracts all American doctoral dissertations written between 1861 and the present. In these volumes, individual dissertations are categorized within an academic discipline according to their author's directions. A survey was made of all anthropology dissertations written from the beginning until 1979 and a list was compiled of all dissertations whose titles either contained the word "primate" or referred to a specific taxonomic group of primates. Undoubtedly there are other dissertations whose primary concern was with primates but whose titles did not make their content obvious enough to include them in the list. Further, there is a time lag of a year or more between a dissertation's acceptance by an academic department and its appearance in the *C.D.I.* Consequently, the figures which are cited below should be viewed as conservative ones (see Table I).

Surprisingly, for a field which has been as interested in the order Primates, as has anthro-

pology, only two dissertations concerned with nonhuman primates were written before 1960. The first was done in 1929 by Wilton Krogman, then at the University of Chicago. It was a study of developmental changes in the faces and crania of anthropoids. The second was completed at Harvard University in 1940 by Sherwood Washburn and focused on a metrical analysis of the skeleton of langurs and macaques. Those were the only two primatological degrees earned in anthropology during the 30-year period between 1929 and 1960. Since 1960, however, the increase in the number of degrees granted has been remarkable. Between 1960 and 1979, an additional 161 degrees were awarded by anthropology departments for dissertations which dealt with nonhuman primates. That figure, however, does not give an accurate indication of how phenomenal the growth of the primatology subfield has been, because 76% (n = 125) of the total have been awarded since 1970. The trend can be seen in even finer detail by noting that almost half of the total number (i.e., 79, or 49%) have been awarded in the past 5 years. It is un-

---

Delivered at the University of Virginia, Charlottesville, December 11-12, 1980.

certain at this point whether the growth trend has peaked.

Thirty-nine universities produced these primatologists. As might be expected, the degree of their representation is not symmetrical (see Table 2). Six institutions (Berkeley, Chicago, Harvard, Davis, Washington, and Oregon) have trained more than half ( $n = 89$ , or 54%) of the present anthropological primatologists. Broadly speaking, primatologists may be regarded as specializing in either anatomical or behavioral research. Although most American institutions offer training in both of these areas, many departments have tended to emphasize one over the other. The University of Chicago, for example, has produced almost three times as many primate anatomists as behaviorists, while the University of California at Davis has produced four times as many behaviorists as anatomists.

Another useful indicator of the growth of primatology within anthropology is the number of institutions which have an anthropological primatologist on their staffs. The American Anthropological Association's *Guide to Departments of Anthropology* in America and Canada lists departments of anthropology, their members, affiliated members from other departments, and their specializations. In the 11-year period between 1968 and 1979 there has been a remarkable rise in the number of departments which either have, or are affiliated with, an anthropologist who lists primatology as a specialization. The *Guide* for 1968-1969, for example, lists only 26 departments and a total of 35 persons,<sup>1</sup> while the 1979-1980 edition lists 106 departments and 153 persons.

Quantified data have not yet been accumulated on all of the indicators of primatology's growing representations within physical anthropology. Nonetheless, it would not be overstating the case to say that there has been an equally dramatic increase in the number of primatological studies reported in the major journals, textbooks, and at conferences in the past 20 years.

#### FACTORS INFLUENCING THE GROWTH OF PRIMATOLOGY

Between the dissertations of Krogman and Washburn in 1929 and 1940 respectively, and the explosion which began in 1960, it is obvious that a number of diverse factors contributed to the momentum which primatology displayed. All of the influential factors cannot be discussed here, but some of the more important contributing influences should be men-

TABLE 1. Doctoral degrees to primatologists in anthropology departments, 1929-1979

Years	No. Degrees	%
1929-1959	2	1
1960-1964	8	5
1965-1969	28	17
1970-1974	46	28
1975-1979	79	49
Total	163	100

tioned.<sup>2</sup> These factors include the resurgence of international research after the end of World War II, the influence of Robert Yerkes's work in primate psychobiology, and the pioneering field studies of his associates Nissen, Bingham, and especially Carpenter, the various symposia which marked the Darwin Centennial celebrations in the 1950s, and the influence of Earnest Hooton, who had suggested at least as early as 1954 in his paper "The Importance of Primate Studies to Anthropology," that separate departments of *primatology* should be established in American universities. Finally, of course, Sherwood Washburn stands as possibly the single most influential person in the promotion of primate studies in American anthropology. His presence at the University of Chicago and then at the University of California at Berkeley stimulated the production of the first 8 modern primatology dissertations and 15 of the first 19. Students trained by him, who then trained students of their own, have probably produced more than half of the present number of anthropological primatologists.

Physical anthropologists were not the only academicians to converge upon wild-living primates during the 1950s, however. Psychologists and zoologists were also initiating field studies of their own. Each of these three disciplines was pursuing questions relevant to its own field and each was faced with the problem of developing methods of study that were appropriate to the kinds of problems they were investigating.

Zoologists probably had the easiest entry into primate field research because zoology already had a strong tradition in the naturalistic study of animal behavior. In addition, zoologists had easy access to the recently emergent theories and methods developed by

<sup>1</sup>The 1968-1969 volume of the *Guide* was the first volume. It should be noted that it is a guide to *graduate* departments. Therefore, the actual number of primate specialists is probably underrepresented in the figures cited.

<sup>2</sup>Professor Rozalind Ribnick of Humboldt State University has recently completed a doctoral dissertation on the emergence of anthropological primatology and I thank her for several useful discussions on these topics.

TABLE 2. Anthropology departments producing the largest number of primatologists, and types of studies engaged in, 1929-1979

Department	Anatomical	Behavioral	Total
U. Cal, Berkeley	14	20	34
U. Chicago	11	4	15
Harvard U.	5	9	14
U. Cal, Davis	2	8	10
U. Washington	7	1	8
U. Oregon	3	5	8
Total	42	47	89

the relatively new science of ethology. Moreover, the range of research questions appropriate for zoological inquiry was somewhat wider since, unlike some psychologists and all anthropologists, zoologists did not restrict their investigations to those aspects of non-human primate behavior which were relevant to an understanding of the evolution of human behavior.

Psychologists, by and large, tended to treat the field situation as though it were an immensely disorganized and uncontrolled comparative psychology laboratory. Their focus was typically turned to matters such as non-human primate problem solving, learning, and the proximate mechanisms of group cohesion. Basically, their concerns grew out of the psychological paradigm that one might gain insight into the mental operations of complex organisms (human primates, in this case) by studying simpler organisms (the nonhuman primates).

#### INFLUENCE OF THE "NEW PHYSICAL ANTHROPOLOGY"

Primatological research conducted by physical anthropologists, as stated before, can be grossly categorized as being either anatomical (including paleontology) or behavioral, although certain kinds of investigations, such as those conducted by functional morphologists, display considerable overlap of those two categories. Although united by a common interest in human evolution, anatomical and behavioral primatologists faced different sorts of problems and had to develop different methodologies for investigating them. Primate anatomists had less difficulty in initiating their studies since they were operating out of a tradition which had encouraged anatomical training. This tradition was being reshaped by the theoretical orientation of the "new physical anthropology." As espoused by Washburn in various writings of the 1950s and 1960s, the traditional approach consisted of the mere comparison of structural features and was too static. He argued that anatomical features must be viewed as adaptive and that an analy-

sis based on function, i.e., behavior, "leads to the reinterpretation of descriptive data" (1963:203). One could study and measure the skeletons and muscles of dead animals, he argued, for only so long before it became apparent that the living animal was going to have to be studied in its natural surroundings if the adaptive value of the structures was to be understood. Laboratory experimentation was viewed as indispensable, especially for testing hypotheses, but the first source of knowledge and a primary source of hypotheses had to be based on a study of the living animal, preferably in its natural habitat.

A multistage strategy for study was then envisioned. It included as a first step the accumulation of data about the nonhuman primates. These data then could be used for comparison with human behavior. After comparison, the emphasis was to be placed on research into those characteristics which seemed to be unique to humans. The final stage of this strategy was then to propose selective mechanisms which might explain how the distinctively human traits had evolved.

A survey of some of the dissertations which I have labeled "anatomical" will serve to illustrate what I have described. These studies tended to concentrate on factors considered to be distinctively human such as the brain, language, tool-making, and bipedal locomotion, as evidenced by dissertation titles such as *Brachiation and Human Ancestry* (Avis, 1960), *The Upper Limb Joints of Macaque and Man: A Comparative Study* (Prost, 1961), *Topographical Organization of the Somatic and Motor Areas of the Cerebral Cortex of the Gibbon and Chimpanzee* (Welt, 1963), *The Functional Anatomy of the Shoulder of the Chimpanzee* (Grand, 1964), *Some Aspects of Quantitative Relations in the Primate Brain* (Holloway, 1964), and *A Study of the Chimpanzee Hand with Comments on Homonoid Evolution* (Tuttle, 1965). Those, by the way, were the titles of the first six anatomical dissertations and they were produced between 1960 and 1965. Although those studies were "functional," or "adaptive," to use Washburn's

term, they were not as oriented toward the study of behavior in naturalistic settings as some of the comparable ones done more recently which have combined field and laboratory observation with modern technology to produce an even more dynamic understanding of the biomechanics of such behaviors as mastication, posture, or locomotion.

Although primate behaviorists proposed to use the same basic strategy as that employed by the primate anatomists, their efforts were hampered by several very basic difficulties. First, the "structural features" of societies, especially those of nonhuman primates, were not easily discerned. Secondly, physical anthropologists had no training in behavioral observation methods and techniques, especially of animals in their natural settings. Thirdly, they faced the resistance of cultural anthropologists, many of whom maintained that nonhuman primate social behavior could not contain the rudiments from which human culture emerged since "the social life of subhuman primates is governed by anatomy and physiology. Variations are direct expressions of biological variation" (Sahlins, 1959:55).

Consequently, anthropology's first generation of primate behaviorists turned to social anthropology for data collection methods and techniques and for their synchronic-level theoretical orientation. For that reason, many of the pioneering efforts were later criticized as suffering from the flaws which have frequently plagued ethnography: (1) They were merely descriptive, and not problem oriented, (2) they were highly impressionistic, and (3) data collection was biased by being passed through a theoretical filter. Perhaps the most influential theoretical filter was that of A.R. Radcliffe-Brown.

#### THE INFLUENCE OF RADCLIFFE-BROWN

Radcliffe-Brown's view that social anthropology should be viewed as a branch of natural science was naturally quite amenable to primatologists. It is obviously impossible to completely summarize his views here, but a statement of some of his major ideas would be of help. Radcliffe-Brown argued that the basic unit of investigation for the student of society is the "social life of some particular region of the earth during a certain period of time" (1956:4). In observing the diversity of particular events, the scientist will discover certain regularities. These regular features, he argued, must be studied by, as a first step, trying to discover their place in the system of which they are a part (1956:6). This presents a

further problem of understanding both the continuity of the system and any changes which it may undergo over time. Adaptation is seen as central to the perpetuation of systems. Even in animal societies: "Social life and social adaptation involve the adjustment of the behavior of individual organisms to the requirements of the process by which social life continues" (1956:81). Social structure is therefore seen as an ordered arrangement of parts or components, in this case, individuals. But individuals are not to be considered as organisms but as occupying positions within the structure. These positions form a network of social relations which are not random, but are controlled by norms, rules, and patterns. In any interactions, each individual knows the norms and expects appropriate normative behavior from others (1956:10). This summary, admittedly inadequate, can allow us to understand many of the behavioral interpretations made by the first anthropological primatologists.

Radcliffe-Brown's influence can be illustrated by looking at the two behavioral studies done by University of Chicago graduate students during the 1960s. De Vore's study of baboons, accepted in 1962, and Jay's study of langurs, accepted in 1964, were the first and third dissertations on primate behavior by anthropologists. Both were heavily influenced in their observations and interpretations by the view of social organization and structure that was part of Radcliffe-Brown's legacy at the University of Chicago after his departure in 1937.

First, De Vore's study, entitled *The Social Behavior and Organization of Baboon Troops*: It begins with the usual methodological introduction. The beginning of Chapter Two ("The Social System: Structural Features") contains the following synthetic statement that implies a way of looking at social life not found in the writings of the psychologists or zoologists who were doing primate field studies at the time:

The most fundamental fact about the structure of a baboon troop is that all of the adult and subadult males of the troop have relationships of dominance and subordination with each other. These dominance and subordination relationships pervade all of the other complex social relations in a troop, and all of adult social acts must ultimately be considered in terms of the actors' positions within the dominance structure [p. 10].

Ultimately, the adult male dominance system is viewed as being the stable force which holds the society together and much of the rest of the dissertation is devoted to describing how the system works.

Jay's (1965) study has the same theoretical orientation. Langurs are described as living in "stable well-organized groups" (p. 216). "The social life of langurs makes the group as a unit possible. Individual members assume roles and activities that assure group cohesion and pacific intragroup relations" (p. 216). "Patterns of interaction within a group can be conceptualized as a clearly defined network of social relationships among its members" (p. 217). "Social maturation is an orderly and well-integrated process characterized at each step by new and changing relationships and behavior patterns" (p. 219).

Although I have cited only two studies for specific mention, the same theoretical tendencies can be seen in most of the early primate behavior studies. One finds, for example, bonnet macaques described as living in groups that are "highly organized" (Simonds, 1965:182), and male rhesus macaques from north India described as leaving their kin groups to join age groups (Lindburg, 1971), or Japanese macaques having a social structure "based not only on a single rank order . . . but also on a system of classes, each one giving to the animal a definite status recognized by all other members and including functions and privileges" (Frisch, 1959:587).

The structural theories of Radcliffe-Brown were quite congruent with the then-ascendant evolutionary view that individual animals acted for the good of their society (and, ultimately, for their species), rather than out of more selfish reasons. This "group selectionist" approach also tended to view the basic unit of selection as being the social group. Behaviors were looked at functionally only to the degree that they contributed to the cohesiveness of the group. Many of the findings reported and interpreted from this "structuralist/group selectionist" theoretical orientation have subsequently been reinterpreted from the currently ascendant viewpoint that the individual is the basic unit of selection, and that individual actions are most profitably studied by asking what they may contribute to individual fitness. Infanticide, for example, once viewed as an example of social pathology (Jay, 1964; Sugiyama, 1967), has been reinterpreted by Hrdy (1975)<sup>3</sup> and others (e.g., Struhsaker, 1977; Angst and Thommen, 1977) as a reproductive "strategy." Dominance hierar-

chies, originally described by De Vore (1962) with a major emphasis on their contribution to social organization, have subsequently been subjected to a number of studies which have emphasized rank as a means of increasing individual fitness (e.g., Bernstein, 1976; Hausfater, 1975; Packer, 1979). Similar reinvestigations have been undertaken of the entire range of behaviors which have been noted among the nonhuman primates.

#### SUMMARY

Physical anthropology's first endeavors in the field of behavioral primatology were heavily influenced by the dynamic views of the "new physical anthropology" which emerged in the 1950s. Lacking a tradition of observational study of naturalistic behavior, the first anthropological primatologists relied heavily for method and theory on the tenets of the "structuralist" approach to social anthropology. With the passage of time, these primate behaviorists began to borrow the field techniques and theoretical orientations being developed by the recently emerged science of ethology. Current research in the field may be viewed as representing a return to a biological, while retaining an anthropological, orientation in the study of nonhuman primate behavior. The biological concerns are evidenced by a strong concern with the interpretation of nonhuman primate behavior in the light of new developments in evolutionary theory. The anthropological concern may be noted by attending to the continued interest on the part of anthropological primatologists in such traditional anthropological subjects as kinship, mating patterns, incest avoidance, exogamy, vocal communication, socialization, and the existence of locally learned behavioral traditions.

#### ACKNOWLEDGMENTS

This paper was originally presented in a slightly different form at the symposium "American Physical Anthropology Fifty Years after Charlottesville" held at the University of Virginia, Charlottesville, December 11-12, 1980. I thank the symposium organizers, Drs. Frank Spencer and Noel Boaz, for the invitation to address the conference.

<sup>3</sup>While doing some research on langur infanticide, I noted that Sarah Hrdy, of Harvard University, had independently noted the influence of Radcliffe-Brown's structuralism on earlier interpretations of infanticide. She also noted its congruence with the theory of "group selection" (see Hrdy, 1977, especially p. 41).

## LITERATURE CITED

- American Anthropological Association (1968) Guide to Graduate Departments of Anthropology. *Bulletins of the American Anthropological Association*, 1(4). Washington, D.C.: American Anthropological Association.
- American Anthropological Association (1979) Guide to Departments of Anthropology, 1979-1980. Washington, D.C.: American Anthropological Association.
- Angst, W, and Thommen, D (1977) New data and a discussion on Old World monkeys and apes. *Folia Primatol.* 27:198-229.
- Avis, V (1960) Brachiation and Human Ancestry. Ph. D. dissertation, University of Chicago.
- Bernstein, IS (1976) Dominance, aggression, and reproduction in primate societies. *J. Theor. Biol.* 60:459-472.
- De Vore, BI, Jr (1962) Social Behavior and Organization of Baboon Troops. Ph.D. dissertation, University of Chicago.
- Frisch, J (1959) Research on primate behavior in Japan. *Am. Anthropol.* 61:584-596.
- Grand, TI (1964) The Functional Anatomy of the Shoulder of the Chimpanzee. Ph.D. dissertation, University of California, Berkeley.
- Hausfater, G (1975) Dominance and reproduction in baboons (*Papio cynocephalus*): A quantitative analysis. *Contrib. Primatol.* 7.
- Holloway, RL, Jr (1964) Some Aspects of Quantitative Relations in the Primate Brain. Ph.D. dissertation, University of California, Berkeley.
- Hooton, EA (1954) The importance of primate studies to anthropology. *Hum. Biol.* 26:179-188.
- Hrdy, SB (1975) Male and Female Strategies of Reproduction Among the Langurs of Abu. Ph.D. dissertation, Harvard University.
- Hrdy, SB (1977) Infanticide as a primate reproductive strategy. *Am. Sci.* 65:40-49.
- Jay, PC (1964) The Social Behavior of the Langur Monkey. Ph.D. dissertation, University of Chicago.
- Jay, PC (1965) The common langur of North India. In IB De Vore (ed): *Primate Behavior: Field Studies of Monkeys and Apes*. New York: Holt, Rinehart and Winston.
- Krogman, WM (1929) A Study of the Growth Changes in the Skull and Face of Anthropoids With Reference to Man. Ph.D. dissertation, University of Chicago.
- Lindburg, DG (1971) The rhesus monkey in North India: An ecological and behavioral study. In LA Rosenblum (ed): *Primate Behavior: Developments in Field and Laboratory Research*. New York: Academic Press.
- Packer, C (1979) Male dominance and reproductive activity in *Papio anubis*. *Anim. Behav.* 27:37-45.
- Prost, JH (1961) The Upper Limb Joints in Man and Macaque: A Comparative Study. Ph.D. dissertation, University of Chicago.
- Radcliffe-Brown, AR (1956) *Structure and Function in Primitive Society*. Glencoe, Illinois: The Free Press.
- Sahlins, MD (1959) The social life of monkeys, apes, and primitive man. In JN Spuhler (ed): *The Evolution of Man's Capacity for Culture*. Detroit: Wayne State University Press.
- Simonds, PE (1965) The bonnet macaque in South India. In IB De Vore (ed): *Primate Behavior: Field Studies of Monkeys and Apes*. New York: Holt, Rinehart and Winston.
- Struhsaker, T (1977) Infanticide and social organization in the redbellied monkey (*Cercopithecus ascanius schmidti*) in the Kibale Forest, Uganda. *Z. Tierpsychologie* 45:75-84.
- Sugiyama, Y (1967) Social organization of hanuman langurs. In SA Altmann (ed): *Social Communication among Primates*. Chicago: University of Chicago Press.
- Tuttle, RN (1965) A Study of the Chimpanzee Hand With Comments on Hominoid Evolution. Ph.D. dissertation, University of California, Berkeley.
- Washburn SL (1940) A Preliminary Metrical Study of the Skeleton of Langurs and Macaques. Ph.D. dissertation, Harvard University.
- Washburn SL (1963) Behavior and human evolution. In SL Washburn (ed): *Classification and Human Evolution*. New York: Wenner-Gren Foundation for Anthropological Research.
- Welt, C (1963) Topographical Organization of Somatic Sensory and Motor Areas of the Cerebral Cortex of the Gibbon (*Hylobates*) and Chimpanzee (*Pan*). Ph.D. dissertation, University of Chicago.
- Xerox University Microfilms (1973) *Comprehensive Dissertation Index 1861-1972*, Vol. 17, Social Sciences, with supplements to 1980. Michigan: Ann Arbor.