tributable to peripheral factors, this does not establish that a unitary central stage has in fact been selectively stimulated. The Müller-Lyer illusion, for example, may be produced by tracing the outlines of the figures on the skin of an observer or by having an observer run his fingers over a raised surface shaped like the arrows of the illusion. This suggests that there are no discrete centers for different aspects of perception. Though Julesz does discuss the possibility of feedback from one stage to an earlier stage, he does not do much about it. Moreover, there is a tacit acceptance of the idea that the problems of perception are solved once one shows how a representation of the world may be formed within the nervous system. Julesz even refers to Hubel and Weisel's units as the "molecules of perception." This is rem-

iniscent of the elementarism of the Structuralists. It leaves out the fact that anesthetized animals have responding sensory neurons but see nothing. Without the capacity for some kind of outflow there can be no perception. This is left out of consideration.

The extent to which Julesz is attracted to the idea that the study of perception involves the finding of representations of percepts at various levels in the brain is best illustrated by his notion about size constancy. He seems ready to accept the idea that if an observer reports that an object appears to grow larger there must be a concomitant enlargement of the representation of the object in the brain. Here he follows Richards in thinking in terms of a literal zooming process. It should be pointed out that many things can go on between a change in eye

vergence or a change in perspective and the judgment of size. Gibson would give such effects a very different interpretation.

Despite all these reservations I must say that I found the book enthralling. It was in the 1860's that Helmholtz published the last volume of his *Treatise*. Apart from largely parametric studies, for the next hundred years little was done to deepen our understanding of binocular vision. At the end of that time we experienced a resurgence of interest in the field, and new insights resulted. Julesz's work was a major factor in creating this new trend. This book details his contributions and allows this reviewer to prophesy that we have not yet heard the last of him.

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A Central Concept in Anthropology

Three Styles in the Study of Kinship. J. A. BARNES. University of California Press, Berkeley, 1972. xxiv, 318 pp., illus. $8.75.

For the past century, since the publication of L. H. Morgan's *Systems of Consanguinity and Affinity of the Human Family* (1871), the study of kinship has been the central and distinctive feature of social anthropology, the arena in which distinguished careers have been forged on the basis of elaborate typologies, candidate laws, structural syntheses, and formal analytics. To borrow a well-worn analogy, the study of kinship is to social anthropology what the study of logic is to philosophy: the basic discipline of the subject.

In this volume J. A. Barnes analytically decomposes aspects of the work of three major kinship theorists, representing maximally contrasting theoretical positions (styles), in order to contribute to the development of "a truly cumulative theory of kinship." The theorists selected have all had a profound influence on the development of contemporary social anthropology. They are George Peter Murdock, Claude Lévi-Strauss, and Meyer Fortes.

A chapter is devoted to the work of each, and the analysis is restricted to the study of kinship and the construction of models. The labels that identify the positions with which these anthropologists have become associated are "cross-cultural, statistically-based research," "French structuralism," and "orthodox British social anthropology," respectively. Their major works on the study of kinship were all published in 1949 and therefore (though there have been important subsequent developments) belong to the post-Malinowskian stage of development. Barnes's analysis, in his own assessment, belongs to the genre that is well exemplified by Abelard's *Sic et Non* (1122) and Parsons's *Structure of Social Action* (1937).

Although the three authors are ostensibly concerned with very similar substantive puzzles, they are, when considered pairwise, as different from one another as a whale is from a fish: they can be compared, to a limited extent, only because they swim in the same medium. This problem, which Barnes clearly recognizes, indicates that myths are far easier to take to

pieces than they are to put together again.

Murdock's studies are associated with the development of the Human Relations Area Files as a basic laboratory resource, with large-scale comparative studies testing the statistical association of various cultural attributes, and with a synthetic form of interpretation that relies to a considerable extent upon an appeal to psychological processes associated with behavioral learning theory. Murdock's method of analysis, considered apart from his specific interpretations and definitions, is a ritual that has made it socially: quantitative, cross-cultural research is a thriving enterprise, the Human Relations Area Files are on deposit in many universities and research centers on both sides of the Atlantic, and there is considerable concern with derivative coding and sampling problems. The game has diffused to other fields of interpretation, such as social psychology, political science, and sociology.

Lévi-Strauss's structural approach, influenced by Roman Jakobson's distinctive-feature analysis of phonological systems (prosodic, tonality, and sonority features), regards the concrete realization of cultural forms—which Lévi-Strauss examines in minute detail—as a message whose meaning can be interpreted only in terms of an underlying code. The decoding process in this game merely constitutes the initial move: the basic conceptual innovation is the idea that codes from seemingly unrelated

domains of meaning can be translated in terms of one another. What one culture communicates in terms of kinship another does in terms of myth, art, or ritual. The permutations and inversions, formulated as transformation operators which map codes onto one another, have resulted in a distinctive conception of structure: a structure is a group of transformations. Since the publication of *Les Structures Élémentaires de la Parenté* (1949), this conception has attracted the attention of two generations of mathematicians to kinship studies (A. Weil, H. White, J. Boyd, P. Courrège, F. Lorrain). The formalization of Lévi-Strauss's structural studies has been conducted for the most part in terms of group theory. These formal developments are not discussed by Barnes. Of greater significance, in the present context, is the continuity of interest and method that obtains between Lévi-Strauss's earlier work on kinship and his more recent and voluminous writings on the structural analysis of mythology.

In his initial volume on mythological analytics (*Le Cru et le Cuit*, 1964), Lévi-Strauss notes that

Myths signify the mind that evolves them by making use of the world of which it is itself a part. Thus there is simultaneous production of myths themselves, by the mind that generates them and, by the myths, of an image of the world which is already inherent in the structure of the mind.

Structural dialectics in the sense of these concluding comments is, in my myth, related to cross-cultural, statistical studies, in the manner of a Lévi-Straussian formula—structural dialectics : cross-cultural research : : transformational grammar : statistical learning theory. The exploitation of this analogical connection might have helped Barnes to glue Humpty-Dumpty together again.

If we are to interpret Lévi-Strauss on his own terms, as a secretor of myths, then it follows that we are unlikely to facilitate understanding by examining only the kinship variant: a myth is defined by Lévi-Strauss as consisting of all of its variants, where "variants" includes interpretations. With this crucial limitation in mind, Barnes manages to provide a most useful introduction to *aspects* of Lévi-Strauss's thought on kinship and exchange, structure and history, deterministic and stochastic models. He explains somewhat complicated arguments and typologies of ex-

change systems with considerable lucidity.

Fortes, unlike Murdock and Lévi-Strauss, is distinguished primarily as an ethnographer—of two West African societies, the Tallensi and the Ashanti (both of Ghana). Hypotheses developed on the basis of his analyses of these societies have then been generalized in the hope of extending their range of validity. Barnes takes the reader by the hand through the thicket of definitions concerned with the distinction between social structure and culture and filiation and descent, the Fortesian analysis of segmentary systems, and various models of processes in time, including Fortes's influential models of the developmental cycle of domestic groups. Aspects of Fortes's writings are discussed with reference to the work of Radcliffe-Brown, with which they are, to a considerable extent, a dialogue, and Fortes's views on incest and exogamy are compared and contrasted with those of Murdock and Lévi-Strauss. Various analytic notions are tied to the ground, linked by correspondence rules to specific details of Fortes's account of Tale lineage organization. Further, Barnes manages to sort out Fortes's ideas on psychology and the relevance of economic factors to equilibrium analysis, as well as to provide some historical perspective by way of comparative commentary on the writings of Evans-Pritchard, Malinowski, Radcliffe-Brown, and Leach. The mechanics of kinship and clanship which emerge from Fortes's analytics have never been so systematically presented: apparent analytic and definitional contradictions are pointed out and frequently explained when this is possible.

Barnes demonstrates that Fortes is not a simple behaviorist, in the sense that norms are interpreted as comparatively invariant features of behavior rather than as multiple outcomes of individual choice behavior. Fortes argues against Radcliffe-Brown's view that structure is an actually existing reality, insisting that structure = grammar and syntax, not the spoken word, and is consequently arrived at by comparison, induction, and analysis. The formal units are, however, explicit in customary behavior and can be determined by techniques of segmentation and classification. Fortesian syntax is therefore analogous to the taxonomic analytics of structural linguistics,

whereas the grammatical constructions of Lévi-Strauss are epistemologically related to the Cartesian interpretations of transformational grammar. For the idea that models constitute "the only reality" (Lévi-Strauss) generates a distribution between deep and surface structure which is then synthesized by grammatical transformations: an underlying core of generative processes determines the deeper levels of structure. Lévi-Strauss's conception of structure predates Chomsky's development of generative grammar: although the formulation is neither as formal nor as systematic it accounts for a wider and more complex set of natural language-based orders.

Murdock's conception of structure, as distinct from those of both Lévi-Strauss and Fortes, is experimental, atomistic, and statistical. Barnes has chosen well: Fortes epistemologically mediates Murdock and Lévi-Strauss on a number of interesting dimensions. Murdock's procedure of interpretation is algorithmic, from coding to testing; Lévi-Strauss's involves the interplay of a data base, heuristic procedures, and a dialectic of innate structures; and the Fortesian procedure is concerned with observation and analytic classification that is limited to a particular kind of content. Murdock determines stochastic measures of association, Fortes classifies analytic processes, and Lévi-Strauss is a cartographer of the multidimensional, logical possibilities of the human mind. Murdock rules time in, not in a historical or evolutionary series but rather in the form of causal linkages between attributes derived from features of lived-in and thought-in orders. Lévi-Strauss's machines suppress time by reformulating possible evolutionary series as generative processes: deeper levels of structure are ordered as logical groups of transformations. Fortes, basically an anatomist of human social organization, reduces the impact of time with a static form of equilibrium analytics on one level and a cyclical conception on the plane of domestic organization.

Barnes has made a valuable contribution to the development of a paradigmatic conception of the unfolding of anthropological thought which assures us once again that in science, as in myth, there are no "privileged positions."

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