the opening chapters, the author takes the reader through the successive steps of the complex analysis of the selected behavior (classical conditioning), the neuronal circuitry involved in this behavior, and the neural changes observed during learning. The description of the learning paradigm that has been studied (association between a light stimulus and rotation) is used to illustrate the constraints imposed upon any underlying mechanisms by the properties of the learning. The wiring diagram is then presented (schematically in the text but in exquisite detail in the appendix), and the author demonstrates that the anatomy of the system dictates the location of the memory traces. A brief (too brief perhaps) description of the basic mechanisms involved in neuronal communication is provided in order to allow the reader to follow what constitutes the main and most interesting part of the book. The author gives a clear presentation of the biophysical nature of the changes in membrane properties that accompany learning and shows how these modifications are sufficient to account for the learning and the retention of the association between stimuli. This section is followed by a less successful attempt at presenting a hypothetical chain of biochemical events, including protein kinase activation, protein phosphorylation, and protein synthesis, which is ultimately responsible for the formation of the memory trace. Whereas until now the author was using data obtained only in *Hermissenda*, this section introduces data obtained in a different preparation (rabbit hippocampus) to complete the model. Most of the evidence in favor of the model is rather indirect, and the book conveys the false impression that the essential steps of the biochemical machinery have been discovered. It is also confusing to read that an inhibition of protein synthesis is associated with an increase in turnover of messenger RNA, and one wonders about the putative changes in DNA synthesis—are the neurons still dividing? Moreover, the mixture of hard data and speculative interpretation or extrapolation is not always well balanced.

The last chapters of the book present some recent data that suggest that similar mechanisms might account for classical conditioning in rabbit brain, more specifically in the hippocampus, a structure that has been shown to play a critical role in memory formation in mammals. The author can then make a relatively strong argument that most of the learning mechanisms discovered so far in "simple systems" are remarkably similar, thus a posteriori justifying the approach. The similarity of the biophysical mechanisms present in hippocampal neurons and in *Hermissenda* is exploited to present a model for associative learning in mammals based on the principles discovered in *Hermissenda*.

Overall I found the book interesting, not only because of the information it contains but perhaps even more because it raises more questions than it provides answers. It will undoubtedly generate new experiments, since several aspects of the general hypothesis can be tested, as well as much discussion among the researchers in a field already rich in controversy. It represents a good example of what can be done with a simple-system approach, even though a question persists after one closes the book: *Is it that simple?* The author is well aware of the problem, and at the same time that he leads us with the assumptions that all learning is reducible to the formation of associations between stimuli and that the traces formed by the associations can be found in simple systems, he recognizes the possibility that additional mechanisms have evolved in mammals and especially in humans that could account for most of what we would call learning and memory. The book should be of interest to a wide range of readers and especially to biology students and to researchers from other fields who want to know more about the biological bases of learning and memory.

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Contending with Language

Cultural Models in Language and Thought. DOROTHY HOLLAND and NAOMI QUINN, Eds. Cambridge University Press, New York, 1987. xii, 400 pp. $49.50; paper, $15.95.

Discourse and the Social Life of Meaning. PHYLLIS PEASE CHOCK and JUNE R. WYMAN, Eds. Smithsonian Institution Press, Washington, DC, 1986. 232 pp., illus. $22.50. Anthropological Society of Washington Series.

Cultural anthropology is in the throes of an identity crisis. Like other social sciences, it is having its "inward turn"—its time for self-questioning and self-reflection. Some anthropologists see this turn as a coming of age as anthropology frees itself from the shackles of a borrowed positivism, renews faith in its distinctive methodology, and develops its own theoretical stance. Others see it as a "navel gazing" that leads nowhere. Anthropology has always been riven with conflict—over its status as a discipline (is it a science? is it an art?), its theoretical orientation, its methodology, its purview. Some have argued that it is not a discipline in any traditional academic sense of the word but an "approach" that is mastered in the doing, and they take a certain arrogant pride in this Wild West pragmatism. Others argue that it is precisely the lack of definition that has to be corrected by the development of rigorous methodologies and epistemologically sophisticated delimitations of the field. And still others take a middle-of-the-road position. They argue that anthropologists do many things, some of which can be treated with scientific rigor and some, perhaps less systematically, with literary and interpretative finesse.

A concern for language, for discourse and text (and, by implication, for meaning), has recently become the arena for the articulation of these positions. Many of the data anthropologists collect are, after all, linguistic and can be subject to rigorous linguistic analysis. They can also be subject to subtle literary critical interpretation. Most anthropologists who opt for the literary critical approach recognize its (traditional) limitations: its failure to regard the literary work as a cultural artifact whose conditions of production have to be understood. A few (and I have some sympathy for their concerns) have succumbed to the lure of Theory, that grab bag of epistemological niceties, of readings and misreadings of Nietzsche, Marx, Freud, Saussure, and Lévi-Strauss, of involuted plays with discourse and metadiscourse, with the dynamics of interlocution, and with the presumptive referentiality of language and its performative, its illocutionary and perlocutionary, effect that has captivated many of today's literary critics.

Proponents of both the linguistic and the literary approaches are represented in the two collections under review. *Cultural Models*, the more "scientific" of the two, is concerned with the organization of "cultural knowledge"—those shared presuppositions about the world that so easily elude formal linguistic and cognitive analyses and are perhaps the greatest hindrance to progress in Artificial Intelligence. Such cultural knowledge is organized, Holland and Quinn, the editors of the volume, argue, in sequences of prototypical events they call "schemas" or "cultural models" that are hierarchically related to one another. And many of the 15 contributions to this volume are attempts to render explicit such models (of

mind by Roy D'Andrade, American marriage by Quinn, anger by George Lakoff and Zoltan Kovecses—to name a few), to discover how they are constructed—Allan Collins and Dedre Gentner on evaporation—and to consider even their practical implications, as Willett Kempton does in his discussion of two models of home heat control.

The editors of *Cultural Models* recognize that the ill-defined "knowledge" earlier cognitive anthropologists were concerned with "has been translated into a narrower concern for what one needs to know in order to *say* culturally acceptable things about the world" (p. 4). This translation, which *may* be justified on epistemological grounds, does raise important questions about the status, indeed the role, of the models that contemporary cognitive scientists derive. Although the contributors have developed frameworks that are more sensitive to context, to choice, to the distribution of knowledge, and to invention than the more or less idealized cultural codes of their forebears in cognitive anthropology—the componential analysts and enthnosemanticists of the late '50s and '60s—their "models" are still removed from their immediate communicative and social contexts and presuppose a mechanical view of human cognition and behavior that leaves little room for creativity. As Roger Keesing notes in his concluding appraisal of the volume, the models may well be an artifact of their elicitation. They are certainly the product of a highly restricted view of "talk" that does not take into account the multifunctionality of linguistic communications. Little attention is given to the effects of interlocution, the indexing of the parties to the (research) encounter, the negotiation of the (oral) genre and conventions of communication and the rules for its framing and interpretation, to the phatic and poetic functions of speech, and to the linguistic ideologies and axiologies that support the conceptualization and evaluation of communication and its *several* functions.

Eve Sweetser's superb discussion of lying and Paul Kay's examination of two English hedges, "loosely speaking" and "technically," do recognize the role of such linguistic ideologies, or "folk theories of language." Sweetser argues, for example, that an adequate analysis of lying in English has to take into account the fact that English speakers consider themselves to be operating in a simplified world in which discourse is taken to be informational. She acknowledges that English reflects the equation of knowledge and power in its use of such evidential hedges as "so far as I know," which can also serve as deference-markers. Lying becomes an abuse of authority. The prototype of the lie seems to be contextual rather than definitional. "Speakers have difficulty in judging whether an action is a lie when they are not sure the action's setting sufficiently matches the prototypical setting specified by the cultural model of informational exchange" (p. 52). The relevant cultural model of language here is not a set of rules about language use but "beliefs about what we do when we use language" (p. 45).

The simplified semantico-referential view of language held, however, by most of the contributors to *Cultural Models* facilitates decontextualization, idealization, and the bracketing off of questions of power and desire. Charlotte Linde's study of the role of explanatory systems such as the psychoanalytic, the behavioral, or the astrological in the formulation and evaluation of life stories would have benefited greatly, for example, from considering the way in which she—the interlocutor—was pragmatically implicated in the stories she collected and analyzed. Explanations index both the speaker's and his or her interlocutor's identity, and some such as the astrological draw the interlocutor into the "complicity" of self-explanation by asking, for example, what the interlocutor's sign is.

In *Discourse and the Social Life of Meaning*, Michael Herzfeld argues that with the development of state ideologies a literalism triumphs over what he calls "semiotic consciousness"—"the awareness that all human experience is mediated, that description must always at some level be construction" (p. 76). In other words, state ideology encourages prescriptive theories of (referential) meaning—of social, ethnic, and moral identity—that serve its conceptual needs of territorial, political, and moral finitude. "Use theories of meaning," those that stress negotiation, what I would call the pragmatic dimension of communication, often associated with minority groups according to Herzfeld, become subversive under such circumstances. Although Herzfeld's thesis can be criticized on a number of grounds including, ironically, a tendency to reify the state, it does call attention to the relationship between theories of language and culture and sociopolitical arrangements that are entirely ignored by the contributors to the Holland and Quinn volume. Those authors do not situate their own work in its political context; they do not consider its political implications. I would argue that their failure to do so results, in part at least, from their essentially monofunctional understanding of language. As Keesing notes, they tend to underplay strategic theories of meaning. Herzfeld could argue that their theory is in fact responsive to state ideology.

The papers in *Discourse and the Social Life of Meaning* are so disparate that they are hard to characterize. Aside from Herzfeld's paper, they include Stephen Tyler's programmatic description of a post-modern anthropology, Paul Stoller's appraisal of the role of "theory" in the writing of ethnography, three studies that stress the intertextuality of cultural documents (Judith Goldstein on Iranian Jewish women's magical narratives, Phyllis Chock on Greek-American ethnicity, and Jon Anderson on Afghani identity), Constance Perin's biologistic speculations on the relationship between meaning and fear, James Peacock's discussion of Primitive Baptists in Appalachia, and Sharon Stephens's historically sensitive study of the relationship between preconceived domains of material practice and ideological structures among the Sami Laplanders. Following Marshall Sahlins, Stephens looks at the role of the cultural constitution of material conditions (for example, pasture quality, predator numbers) on the perpetuation of Sami ideology.

Chock and Wyman make a valiant effort to justify the inclusion of these papers in a single volume by arguing that they are representative of a cultural analysis that recognizes the limits and entailments of reified notions of language. This would be Tyler's post-modernist position—a highly controversial one—which I fail to see seriously reflected in the other contributions. Stoller's extolling "ethnography" comes closest to Tyler's position, but, unlike Tyler, he has faith in the role of experimental writing in breaking through the confines of *his* determining Western episteme.

Tyler, once an advocate of cognitive anthropology, now argues extravagantly for a post-modern anthropology—an anthropology that studies man talking, that understands discourse as making (and not mirroring) the world, that replaces the predominant "visual metaphor of the world as what we *see* with a verbal metaphor in which world and word are mutually implicated" (p. 23; see also Tyler's most recent book, *The Unspeakable: Discourse, Dialogue, and Rhetoric in the Postmodern World*, University of Wisconsin Press, 1987). All of this sounds very "with it"—something we might expect to read in *October* but not in a collection of anthropological papers that treat meaning and discourse. Anthropology has always appealed to the quirky, it has had more than its share of visionaries, mystics, and charlatans—we can hear Tyler's critics.

But before we dismiss Tyler we should hear him out. What he offers us, through hyperbole, through contradiction, through a language that is both analytic and prophetic and a style that is at once lapidary and opaque—through the oxymoron—is philosophical discomfort. He raises the question

of our own, Jacques Derrida would call it, logocentric assumption, one that acknowledges the formative influence of our conception of writing as a derivative recording of the spoken, but, if I understand Tyler correctly, he does not advocate, as Derrida would, a new episteme of writing. He argues that writing forces the split between signifier and signified, creates a shadow of reality, shifts "the locus of reality" to "a world of form indirectly available to the knower," and displaces the subject from the world. In a tour de force that is brilliant in its comprehensiveness if not in its detail, Tyler diagrams the implications of this conception of writing on Western thought/discourse. What he advocates is the elimination of *the idea of representation* and (contra Derrida) a return to the saying, to the oral, perhaps even to common sense and realism, to a writing (if it is possible) that creates what speech creates and does not merely imitate speech.

Despite its play, its subversiveness, its hyper-reflexivity, Tyler's project is ultimately naïvely salubrious. (Perhaps such a stance demands naïveté.) Although he (like Stoller and, to a lesser extent, Herzfeld) questions the epistemological assumptions of the discourse that has created anthropology and its by-products "culture," "society," and the "primitive," his questioning fails (he would maintain inevitably) to take account of the effects of material constraints (however culturally defined), of power (however institutionally deployed), and of desire (however socialized) on his own "talking" and "saying." Ironically, he shares this failure with his more positivistic colleagues in cognitive science. Whether we see, on empirical grounds, a determining relationship between socioeconomic reality and the cultural (including our own theories and descriptions of culture) or understand this relationship rhetorically, we have to recognize the moral and political consequences of such a juxtaposition. We have, in other words, to ask what are the implications of anthropology's self-questioning, its focus on language, talk, text, and meaning, and its flirtations with such hegemonic discourses as cognitive science and such subversive (albeit fashionable) ones as literary deconstruction.

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Commons Viewed Ethnographically

The Question of the Commons. The Culture and Ecology of Communal Resources. BONNIE J. MCCAY and JAMES M. ACHESON, Eds. University of Arizona Press, Tucson, 1987. xvi, 439 pp., illus. $35. Arizona Studies in Human Ecology.

The "tragedy of the commons" is Garrett Hardin's evocative phrasing of the following dilemma: For open-access, finite resources, each user will gain the full benefit of exploitation but will share (or externalize) its cost over the group of users. As population grows, individuals have incentives to expand their exploitation well beyond the optimal yield or capacity of the resource. The rational, maximizing choice of each eventually and inevitably will bring ruin to all. Here is the back of Adam Smith's "invisible hand." Whether parking spaces, marine fisheries, atmospheric pollution, or the Sahelian drought, the logic is the same.

Hardin proposed only two solutions to this tragedy: turn the commons into private property, so that the long-term costs of exploitation, or conversely the benefits of conservation, are realized only by the user (internalized), or regulate the commons through coercive, governmental authority. Only thus could "the remorseless working of things" (Whitehead) be averted.

This collection of 18 papers by anthropologists, political scientists, and economists evaluates the Hardin argument against the evidence of ethnographic case studies. Most of the papers focus on fisheries, but commons associated with foraging, grazing, and cultivation come under scrutiny. The consensus of these analyses is important: commons seldom are open-access resources but often are managed through adaptively flexible, localized, and historically specific forms of internal social regulation. By qualifying the premise of Hardin's argument, the studies also broaden the range of possible solutions to the vexing issue of commons management. Although the authors and editors stop short of devising a formal model of the commons more comprehensive than Hardin's, collectively they sketch its outlines.

In Hardin's view, population growth was the preeminent threat to common resources. In contrast, papers in the McCay and Acheson volume emphasize political and economic factors. Thus, McCay argues that open access to natural resources became encoded in North American law as part of the colonial revolt against the aristocratic monopoly of commons in the Old World. And Durrenberger and Pálsson describe how Icelandic fish populations came under stress when the fisheries shifted from local subsistence production to participation in expanding markets and capitalist forms of enterprise.

A closed territory and delimited community of users appear to be key conditions for the successful social management of common resources. Two systems of territory coexist in the Maine lobster industry: a nucleated form that does not prevent overlapping use by adjacent communities, and a perimeter-defense model that successfully prohibits incursion. Acheson shows that the latter has beneficial economic and biological consequences, deriving from enhanced opportunities for internal management. Ostrom's comparison of alpine commons in Europe and Japan substantiates the hypothesis that systems of land tenure can be closely adapted to local use. These successful systems have had long periods for trial-and-error development, and they allow fairly close monitoring by community members. A Kwakiutl community (Pinkerton) successfully united to oppose national policies that threatened their common salmon resource, despite divergent economic interests. In Iceland, group action was enhanced by dependence of the whole economy on common fishing grounds. Internal stratification need not prevent community action; constrained alternatives may promote it.

The social regulation examined in these studies is not simply a poor or archaic substitute for Hardin's solutions. Management by property rights is ineffective for spatially concentrated but mobile resources that move unpredictably over large areas, be they lobsters (Acheson), fish stocks (Townsend and Wilson), or ephemeral grazing opportunities (Peters). And management by external authority can founder on conflicting political objectives, limited understanding, and constrained ability to monitor and regulate local constituencies and ecological conditions, whether in Malaysia (Anderson) or British Columbia (Pinkerton).

Flexibility closely matched to highly localized ecological conditions emerges as an important feature of these socially managed commons. In Tigray Province, Ethiopia, communities have a history of deliberately switching back and forth between private and communal land tenure (Bauer). A community depopulated by drought or needing to consolidate its defenses against political threat will shift to communal tenure in order to attract immigrants. When population growth leads to resource scarcity within the community, private land holdings are reinstituted, despite the social friction involved in allocating shares. In another case, located in lowland Borneo (Vondal), dry land is a privately held agricultural resource whereas swampland is a commons. Owing to shallow relief and seasonal inundation, private and