

# UC Irvine

## Structure and Dynamics

### Title

The Recognition of Kinship Terminologies As Formal Systems

### Permalink

<https://escholarship.org/uc/item/2b90r031>

### Journal

Structure and Dynamics, 6(1)

### Author

Leaf, Murray

### Publication Date

2013

### DOI

10.5070/SD961017981

### Copyright Information

Copyright 2013 by the author(s). All rights reserved unless otherwise indicated. Contact the author(s) for any necessary permissions. Learn more at <https://escholarship.org/terms>

Peer reviewed

# THE RECOGNITION OF KINSHIP TERMINOLOGIES AS FORMAL SYSTEMS

Murray J Leaf  
School of Economic, Political, and Policy Sciences  
University of Texas, Dallas  
Dallas, Texas USA  
[mjleaf@utdallas.edu](mailto:mjleaf@utdallas.edu)

---

*We now know what kinship terminologies are and what their function is in kinship systems, even though this knowledge is not yet widespread. Every social system consists of a set of organizations built up interactively by the use of specific idea systems: governmental systems are systems of organizations built up by the use of governmental ideas, military systems by the use of military ideas, economic systems by the use of economic ideas, and so on, including kinship systems by the use of kinship ideas. These social idea systems are not preeminently nomenclatures per se, but are associated with distinctive nomenclatures, just in the way that geometry is not a nomenclature but is associated with a nomenclature. For kinship, the core of the nomenclature has mainly been encountered and studied under the heading of "kinship terminologies." The ideas associated with them are the ideas that make up their definitions. These are highly systematic and form powerfully generative conceptual calculi. This paper describes how this recognition has emerged from earlier, quite different, formulations.*

---

## **The Idea of Kinship Ideas**

Kinship analysis since Lewis Henry Morgan has gone through several cycles of birth, death, and rebirth in new forms in successive generations. This cycle does not correspond to Kuhn's sequence of new paradigm, normal science, and paradigm shift, although Roy D'Andrade (1995: 11, 12), among others, has argued otherwise. Paradigm changes are driven by discrepancies in characterizing otherwise well agreed upon phenomena. Kinship theorists have not agreed upon the phenomena that need to be understood and the disagreements over how to understand kinship ideas have been thoroughgoing and multi-dimensional. While ethnologists have spoken of kinship "systems" virtually from the beginning, there have been profound disagreements over what the systems consist of and what makes them systematic. The cycles have involved increasing elaboration of methodological proposals in pursuit of promised results regarding one or another aspect of kinship that are poorly identified empirically to begin with and become progressively more remote as the literature builds up. Method or theory A is offered, with initially weak results accompanied by a promise of better to come. Others join the argument, focusing on the weaknesses. The method is elaborated and qualified to escape the criticism, but instead of reducing disagreement the elaboration only increases it. Fur-

ther criticism follows and is responded to with still further elaborations and qualifications of the method or theory. Conceptual overhead increases, actual results do not improve. The debate becomes more difficult, ideas about terminologies become more arcane, and frustration builds. Finally, without diagnosing the real reason for the lack of results, method or theory A is abandoned in favor of a proposal for method or theory B. Theory B purports to be new, but is based on the same assumptions as theory A. The same thing happens with B, which is replaced by C, always starting over with the same underlying assumptions and never regarding the repeated failures as evidence that there might be something wrong with these assumptions.

My argument is that the core phenomenon that makes kinship systems systematic is what anthropologists have been struggling to get at under heading of “kinship terminology.” This was a growing concern from Morgan up to the near-collapse of all interest in kinship in the 1990s, and still continues to some extent under the heading of cognitive anthropology. The struggle has been based on two assumptions. The first is that kinship is in some important sense demarcated culturally by the use of special terms or language, especially special terms for kinship relations. The second is the idea that the analysis of such terms requires a referential theory of meaning. The referential theory asserts that meaning is a kind of pointing: that the meaning of a term or phrase lies in what it refers to.

While the first assumption is correct, the second is fundamentally wrong and misleading. Although kinship terminologies, in the sense that I will describe them here, are of the first importance both in their own right and as a key to understanding the rest of kinship, the path to understanding them, and even to finding them in a clear and clean way, has been repeatedly blocked by versions of the referential theory of meaning and its associated assumptions.

There are many versions of the referential theory of meaning, in and out of ethnology. The main source for the versions that have been important in the analysis of kinship terminologies has been philosophical positivism going back to J. S. Mill and Vienna Circle logical positivism. The influence of the French positivists associated with Emile Durkheim has also been important in kinship theory in general, but not in the specific area of theories of meaning. The first major figures in the United States to use referential conceptions of meaning drawn from positivist sources were Alfred Kroeber, Robert Lowie, and other diffusionist associates of Clarke Wissler in the early 1900s. Positivist assumptions and arguments became more explicit with the methodological and epistemological declarations of G. P. Murdock. They became more explicit still in the various forms of transformational analysis, componential analysis, rewrite rules, and cognitive anthropology advocated by former Murdock students as well as by the post-war cohorts of students coming out of the Harvard Department of Social Relations (Leaf 1979: 278-298).

In addition to the referential theory itself, and reinforcing it, is another other main idea drawn from the positivism of Mill and the Vienna Circle that can be described as anti-conceptualism. This is the very simple but profoundly wrong-headed idea that ideas, as such, cannot be the subject of science. More precisely, the only ideas science (in this

positivist view) could recognize were their own: the actual subject matter of science could only be things that were “objective” in a physical sense—the position Otto Neurath and others have described as “physicalism” (Neurath 1959). In the analysis of kinship terminologies, the referential theory of meaning and physicalism have strongly reinforced each other. One has to find meaning by seeing words as sounds (physical objects) designating things of some kind (physical objects) *because* only physical things like words, objects, and “concrete behavior” can be described objectively. It is not scientific to think that meaning might lie in ideas associated with words, rather than in the words (sounds) themselves, because ideas cannot be described objectively.

The force of the two assumptions together was neatly demonstrated to me by David Schneider, around 1970. He was at the University of California at Santa Cruz. I was visiting the campus. In the process, I gave a presentation of my own method of kinship elicitation and analysis, which does not depend on a referential theory. Schneider’s response, which he meant to be understood as fundamental criticism, was “a kinship term is a term for a kinsman.” The implication was that terms and kinsmen were real, but terminologies in the sense that I had described them were not. I knew this was his view; it was precisely what I was trying to convince him to abandon. He did not do so.

There is no need here to review and criticize the line of analysis of kinship terminologies from Rivers through Murdock to componential analysis and allied approaches. Schneider published an extensive critique in 1965, and it still stands. But I should point out that Schneider’s own use of the referential theory was no more productive than any of those he so effectively criticized. His book, *American Kinship* (Schneider, 1968), was based on data obtained by teams of University of Chicago anthropology graduate students interviewing families in the Chicago area about their kinship relationships and behaviors, under the supervision of Schneider and Calvert Cottrell. It was not an investigation of a terminology or an effort to find out what a terminology was, but an effort to find out what kinship itself was. A terminology did have a role, however: it was how Schneider and his team determined, using snowball sampling, who to talk to. A core sample of families was identified, and finding who they, in turn, named as their relatives extended the network of interviews. Interviews were about many things, apparently, but the basic idea was to ask about their relationships and behaviors in order to get at their underlying idea of what kinship itself was, what held them together as kin. The conclusion was quite literally nothing in particular; they simply *were* kin. As Schneider put it, they recognized relations of “diffuse enduring solidarity.” These relations are taken as persisting through time, seemingly unchanged in an enormous but unspecifiable range of different circumstances, “refracted” out of the “central symbol” of incest. For example:

One of our informants, a twelve-year old girl, was asked, “What’s your definition of a relative?” and replied “Someone who you generally love, a daughter or something.” There is really nothing more that can be added to her statement. It sums the matter up perfectly.

All of the significant symbols of American kinship are constrained with the figure of sexual intercourse, itself a symbol of course. The figure is formulated in

American culture as a biological entity and a natural act. Yet throughout, each element that is culturally defined as natural is at the same time augmented and elaborated, built upon and informed by the rule of human reason, embodied in law and morality. (1968:40)

Schneider's method was entirely consistent with the idea that the meaning of terms lies in what they refer to. If kinship terms are terms for kinsmen, then the obvious way to find out what the terms mean, and what kinship is, is to find the kinsmen and ask them. Unfortunately, with this method it is absolutely impossible to know if the responses one gets are private opinions or well-established cultural conventions, and if they are the latter, it is further impossible to know how widely they are held and how they are promulgated. As the quoted passage illustrates, a "definition" of a relation becomes simply an individual opinion about that relation. Culture, by implication, then becomes nothing more than the analyst's summary or assessment of some set of such opinions. In fact, kinship terminologies can no more be obtained by summarizing individual opinions in this way than Euclidian geometry can be learned by interviewing people about lines, squares, and triangles—or about Euclid.

With terminologies thus set aside as non-problems at the outset, what could Schneider's interviews seek? It could not be ideas because of his underlying positivism. So what he found was "symbols," in an odd sense. Symbols are normally contrasted with signs. Signs are things that stand for other things because of a natural connection with them, as smoke is a sign of fire. Symbols are things that stand for other things as a matter of convention, like the word "fire" taken as indicating a fire or a red light representing the command to stop. But this is not Schneider's sense here. The "significant symbols" are not words for intercourse but things (he would say "cultural constructs") like love or a daughter, and intercourse is not what they conventionally refer to but yet another symbol that "constrains" them. His imagery is that of a culture, or cultural system, as a total system of symbols, and only symbols, some of which are central and some of which are peripheral.

The roots of positivism lie in Hegelian idealism: the idea that ultimately mind is independent of material nature and all order comes from mind imposing itself on nature (including individual human beings). Hegel's mind or "reason" became the positivists' "theory"; Hegel's material world became the positivists' "sensations" that theory must be imposed upon. With Schneider's idea of symbolism, the underlying Hegelian idealism came back to the surface. Schneider's conception of culture as a system of apparently self-existent symbols is a new version of the Hegelian conception of the world as a system of self-existent ideas and Schneider's argument is as completely circular and independent of any possible empirical confirmation or disconfirmation as the original (Leaf, 2001). Schneider next moved into "symbolic anthropology" and finally declared kinship to be a non-topic, along with economics, politics, and religion. They were nothing more than "metacultural categories imbedded in European culture which have been incorporated into the analytic schemes of European social scientists" (1987:184). Many others have agreed. Fortunately, they are wrong. What was unreal in this framework was the

positivist conception of science and meaning. Kinship is still out there, as important as ever.

The alternative to the referential theory of meaning is a pragmatic conception, which I have described elsewhere (Leaf 1972, 1984, 2006) and will return to below. Pragmatic epistemology has no problem recognizing ideas; the problem is only to make them clear. On this basis, I want to say as plainly and simply as possible what the actual phenomenon is that ethnologists have been trying to get at in their struggles with kinship terminologies, and what has contributed to finding it.

### **Terminologies are Systems of Ideas**

Let me assume that we now agree that every human community is pluralistic, meaning that it has multiple social systems and not just one “total” system. Every social system is a set of organizations built up interactively by the use of a specific social idea system: governmental systems are systems of governmental organizations built up by the use of governmental ideas, military systems by the use of military ideas, economic systems by the use of economic ideas, and so on—including kinship systems by the use of kinship ideas (Leaf 1972, 2009; Leaf and Read 2012).

Each of the social idea systems in a community is associated with a distinctive nomenclature, a distinctive vocabulary. Once anthropologists recognized that kinship as a social system had a distinctive nomenclature that went with it, it was a short step to assume that by studying the use of the terms we could find out what kinship itself was. It was another short step to try to reduce the nomenclature to a “kinship terminology” in the sense of a taxonomy. The first step was a little bit wrong; the second was very wrong.

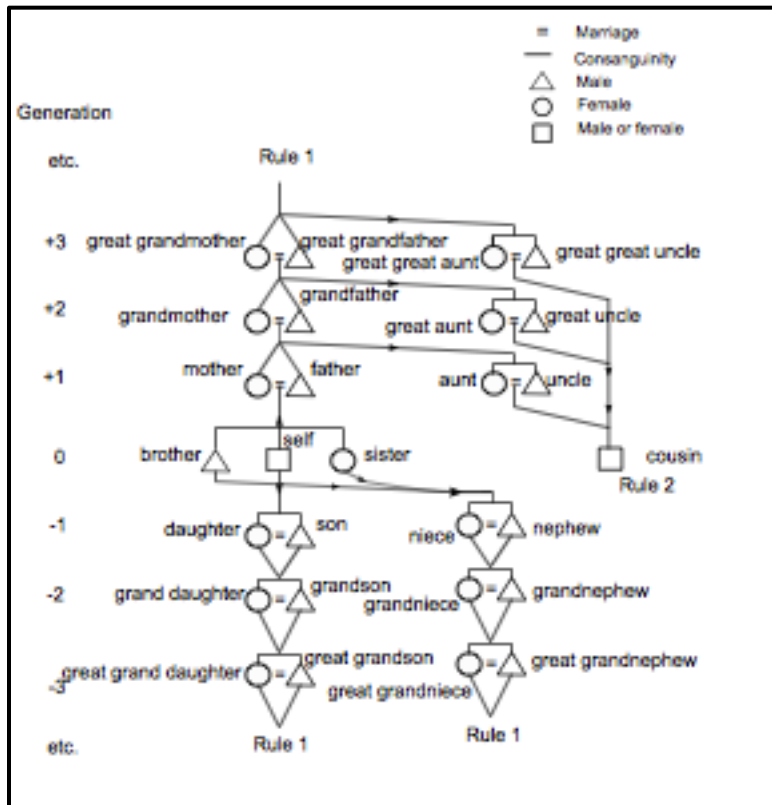
Kinship nomenclatures, as such, are real enough in the sense that it seems that every community has one that they recognize as such, and members can talk readily about informal and formal usage, when to use terms and when not to, and so on. But this is not the most important phenomenon. The terminology, in itself, is not what holds the various aspects of what we recognize as the kinship system together. The terms, as such, are not what really mark it off from other social systems. One can make the same demarcations without using them. The important phenomena are what the nomenclature designates, and these are systems of ideas: kinship idea-systems. Kinship idea-systems are not just any ideas “about” kinship and they are absolutely not individual opinions. They are highly ordered and clearly demarcated conceptual calculi, held in firm and self-reinforcing consensus, which provide the shared conceptual material out of which kinship relations are constructed.

Kinship idea systems are like all other social idea systems in some respects and different from them in others. They are like all others in that they define sets of reciprocal relationships, that these relations can always be represented in a graphic form, that there is a specified method for computing relationships among people who are deemed to be in positions or relations within the system, that this method is recursive, and that the relationships are transitive and reciprocal. A recursive computation is a computation like “under the military command of,” such that we can say A is under the command of B, and B is the under the command of C, and so on. A transitive relation means that if A is re-



*The Three Levels of Analysis*

The three levels of analysis are the kinship map, the kin term map, and the underlying kinship algebra. All of these are empirical in a strict sense, and all are also formal in a strict sense. The kinship map is the “surface” phenomenon. It is elicited in the field by a definite and replicable method. This method is essentially a frame analysis that uses the initial core ideas to elicit all the other ideas in the system—and in the process to replicate and record its generative logic and mnemonics (Leaf 2006). It is also often possible to reconstruct kinship maps from ethnographies.



**Figure 2:** English kinship map, main terms (leaving out relations by marriage).

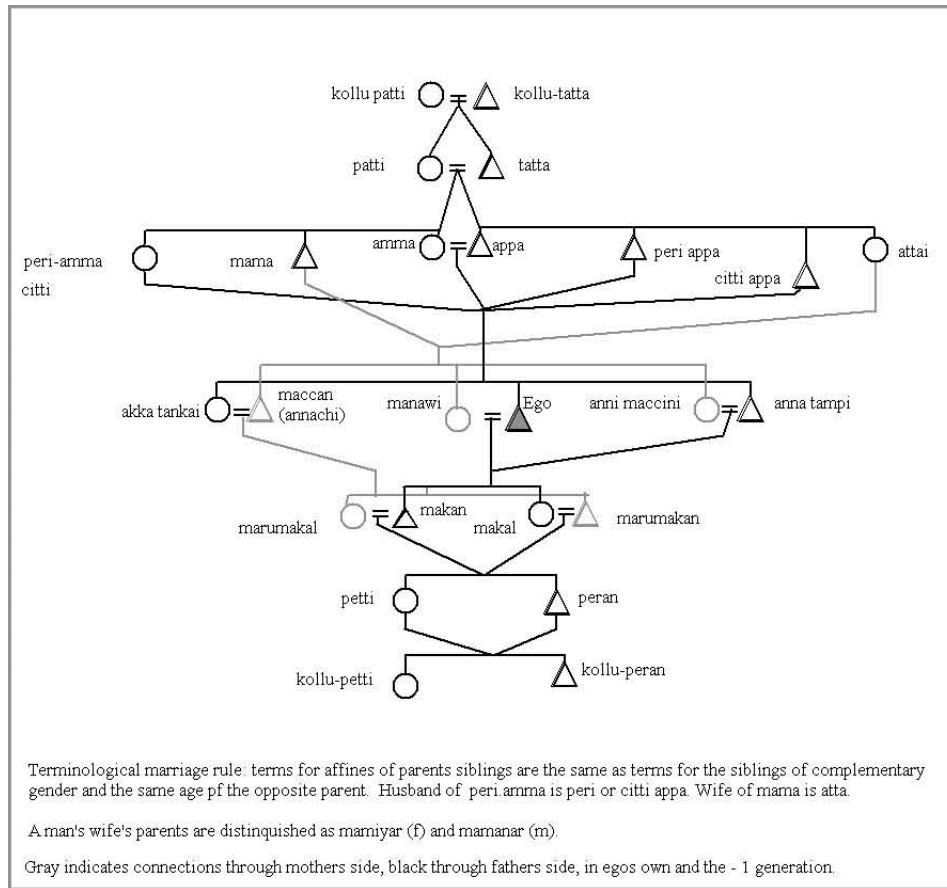
The first kinship map I described was for Punjabi, elicited in 1965 (Leaf, 1971; see Figure 1). This was promptly replicated for Hindustani by Sylvia Vatuk (Vatuk 1972): slightly different terms, but clearly the same idea-system.

In 1974, I presented a kinship map of English (see Figure 2) to a departmental seminar at UCLA. My purpose was to show how its generative structure provided inherent instructions for its reproduction by its cultural users. Dwight Read was among those present and saw the implications for the next two levels of analysis. (For comparison, I also include here a

kinship map of Tamil in Figure 3).

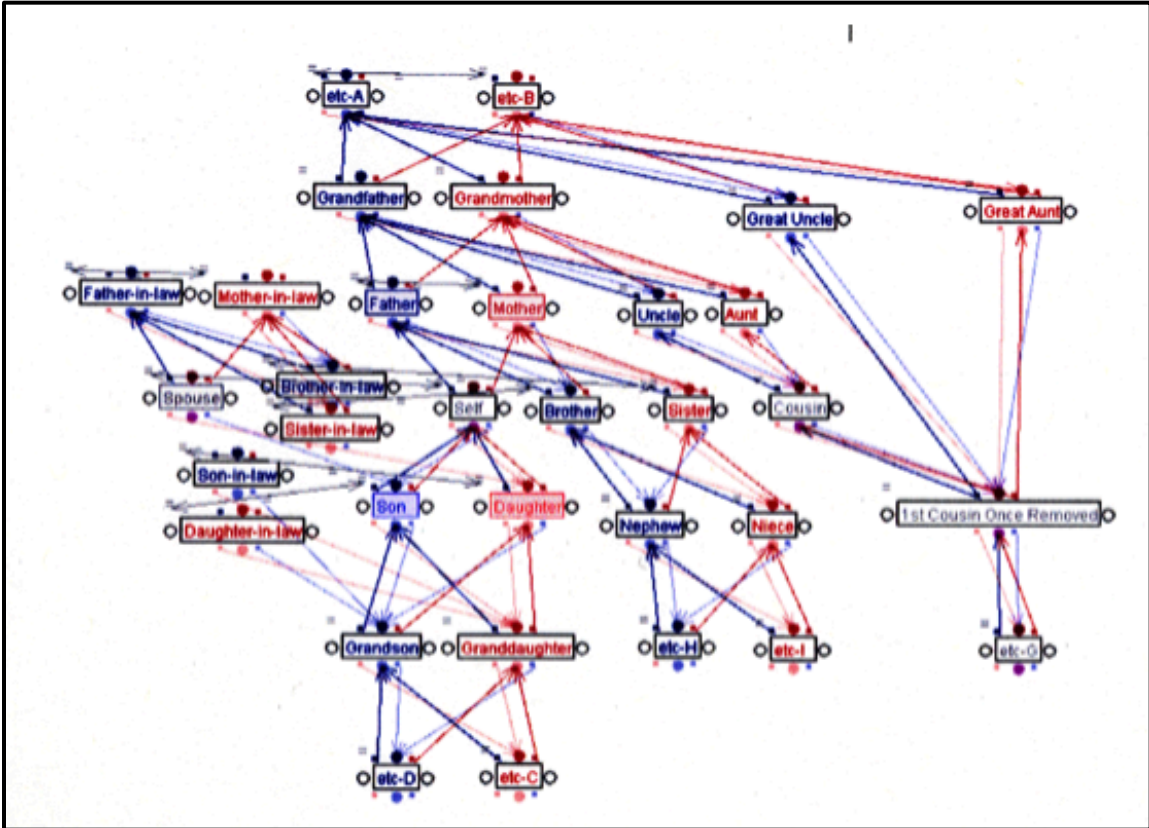
The different shapes of the kinship maps mean that each system has a different logic; each position in it is defined in different way in relation to all other positions. The overall sense of what kinship itself is differs as well. In English, the main division between sets of positions in the map is between a clear line of lineals and branching off collaterals, so kinship is mainly a matter of the ascribed relation of descent, conventionally called “blood.” The line of ancestors potentially goes on forever, so in the English idea-





**Figure 3:** Tamil kinship map.

system it is impossible to have an ancestor who is not a relative. Being kin is therefore mainly a matter of sharing “blood,” or common descent. By contrast, in the South Asian systems, Punjabi and Tamil, there is no indefinite upward extension. There, the top and bottom positions shown in the figures are definite limits beyond which one may be an ancestor or descendant but not have a kin relation. Yet the horizontal, referential scope of terms is very broad. On ego’s own generation there are many ways one can be related as the counterpart of the English “brother” or “sister.” In indigenous terms, one can have many kinds of brothers and sisters, but some are much “closer” than others. So in both South Asian systems, kinship is a matter of relations that are acquired and cultivated, but in different ways. In Punjabi, there is a clear difference between “sides”: mother’s side and father’s side, and the occupants in these sides are not kin to one another. In Tamil, there are also two sides, but the sides come together at the top and bottom. This means they are kin to one another. Consequently, in Tamil, a marriage is part of a continuing system of relations between parallel, related descent lines going through successive generations. In Punjab, a marriage is a relationship between unrelated lines focused on one household at a time and constantly changing through the generations.



**Figure 4:** English kin term map.

An elicitation of Czech, French, or German kin terms yields a map with different terms but the same shape as English. An elicitation of Kannada yields different terms but the same shape as Tamil. QED: Terms are one thing; the idea systems are another.

In 1974 Read published “Kinship Algebra: A Mathematical Study of Kinship Structure.” The argument was that terminologies had their own logic which was not dependent on reference to genealogy, and that this logic could be precisely and formally specified in terms of set theory. In “An Algebraic Account of the American Kinship Terminology” (1984), he further developed the analysis, using the formalism of abstract algebras with the English terminology as a case study. Read began with what he calls a kin term map (see Figure 4), namely an isomorphic version of the kinship map I had presented (at this point, my analysis of the English terminology had been circulated informally but had not yet been published) that makes evident the inherent, algebraic structure of the terminology. Then, working with his Ph.D. advisee Clifford Behrens, Read developed the first version of the Kinship Algebra Expert System (KAES). This generalized the analysis and identified the generative components of any kinship idea system so as to reproduce the component positions in the kin term map from its generative premises (Read and Behrens 1990). Development of the KAES program (Read 2006) has continued as a way to further work out Read’s theory (2001, 2007) about the logic and structure of kinship terminologies (Read 2012, personal communication).

The current version of KAES, which implements the ideas of Read and was written in Java by Fischer, is available on the Internet at <http://kaes.anthrosciences.net/>. The KAES analysis begins with a kin term map. A kin term map is isomorphic to a kinship map and can be derived from the latter by stripping out graphic representations for everything other than the named positions and their structural relationships. The KAES program works out the algebraic computations by which the kin term map can be generated from the structural core of the terminology. To minimize opportunities for confusion, we use the standard kin terms for each position, but strictly speaking the terms can be replaced with arbitrary symbols without any change in the subsequent analysis.

The kin term map allows one to uncover the underlying generative logic by finding which terminological distinctions can be removed and replaced by mapping rules, and in what order, such that at the end of the process one will have a core structure that cannot be further simplified from which a set of rules that will regenerate the original kin term map can be determined.

As Read has shown, kinship computations always start with two basic algebraic concepts: an *identity* concept that structurally defines kin term reciprocity and an *other* concept that is used to define additional kin term concepts. An example of the use of the identity concept is that for English speakers, the reciprocity of the kin terms father and son is determined by the computation, father of son is self, for a male speaker. An example of the use of the other concept to define a new kin term concept is that son of father is the kin term brother (rather than the term, self). The latter computation is the conceptual means for introducing collateral kin terms in kin term maps like English. The rest of the system is generated from computations using the core terms. Systems with different graphic shapes have different patterns of computational rules, and sometime start from alternative concepts of “self” as a starting point (e.g., one self vs. male self or female self) (Read 1993; Leaf and Read 2012).

### **Steps in This Direction**

Now, given that kin term maps as generative systems are what the efforts to describe terminologies were intuitively recognizing, what were the steps that finally contributed to getting them out in the open? I will list what I think Read (and others such as Fischer) would generally agree with, although we all would have others that were more personal.

First, within anthropology, Lewis Henry Morgan clearly had most of the elements in more or less the right relationships. He saw that kinship was both universal and, crucially important, he saw it as a separate sphere or arena of activity, distinct from others (mainly from “government” and technology, in his accounts of the Iroquois). He saw that different kinship systems had distinctive patterns in their nomenclatures, and in a confused way he recognized that the importance of the nomenclatures lay in these underlying patterns. Where he went wrong was his view that these underlying patterns were patterns of something else. Instead of seeing them in idea systems in their own right, he saw them in different kinds of “family,” by which he meant, or tried to mean, actual, concrete, co-residential organized groups. Although he did not articulate a formal referential theory of meaning, he must have had one in mind.

R. H. Barnes argues that Joseph Köhler made the next major advance in the analysis of kinship terminologies in *Zur Urgeschichte der Ehe (On the Prehistory of Marriage)* (1897, translated by Barnes 1979). Köhler recognized that where Morgan's lists of terms gave the same translation gloss for different indigenous terms, the common gloss could be represented as a genealogical equation: father = father's brother, or wife = mother's brother's daughter. Terminologies could therefore be classified by the equations they contained. Barnes is absolutely right in saying that this was an important step on the way to componential analysis. Perhaps it is also the first hint of an underlying mathematics. But it is not the right kind of mathematics and I do not think it contributed more than Morgan himself contributed to what turned out to be right. If anything, it reinforced the incorrect notion that the underlying patterns in kinship terminologies were patterns of something else. For Köhler, the something else consisted of equations expressed using products of genealogical relations.

W. H. Rivers contributed the intuition that the logic of kinship relations could be represented diagrammatically. Kinship relations are culturally represented as though they occur in space; they can be drawn. Unfortunately, evidently still thinking that kinship could only be a matter of real biological relations, he related this imagery only to genealogies. His argument was that in primitive societies all relations were based on kinship. So if one started by gathering genealogies, every person's relation to every other could be established. Then all their various roles, relations, and obligations could be laid out on this common genealogical framework and we would have a picture of the entire society. Finding terminologies was a subordinate problem. Once one had everyone's "pedigree," Rivers recommended asking for the terms that were applied to a specific list of such individuals; he provided a reduced version of Morgan's list of English descriptions for the relations that such an enquiry should include. The list, together with the emphasis on genealogy, effectively precluded the possibility that Rivers' recommendations would lead to the discovery of kinship idea-systems as I have described them.

The first use of the term "terminology" to designate the corpus of terms obtained by the kind of procedure recommended by Morgan and Rivers appears to have been by Jaime de Angulo, in 1925, for Taos. However, at least as many of the ideas that presaged our present understanding of kinship terminologies lie outside of kinship analysis proper as lie within it.

For me, the first in order of temporal priority has been the general idea of a cosmology, a comprehensive view of the universe that I encountered as an undergraduate in philosophy. Cosmologies are clearly inventions, and in a sense fictions, but the major variants have been remarkably consistent and compelling from the beginnings of written scholarship to the present. From this background, my first question as an anthropologist has always been how much of the rest of what we call culture was the same sort of thing. My sense is that Read had similar questions based on similar familiarities with closed logical systems in his own background. Perhaps I should note that Read and I are both graduates of Reed College. The Reed curriculum provides an unusually intensive and "integrated" approach to the arts, humanities, sciences, social sciences and mathematics using primary materials in such a way that the students individually and collectively are

forced to develop their own analysis of what ideas are most important and why. The idea that ideas formed systems was on virtually everybody's menu at all times. While we were students there, for example, the introductory mathematics course, Math 101, rather famously used no standard textbook but rather a book by the Reed mathematics faculty on the logical development of the real number system. The freshman humanities course began with students learning to chant, in Greek, the opening passages of Homer's *Odyssey*.

The second contribution, and much the most important, was Kant's conception of the *synthetic a priori*. Ideas or judgments that were *synthetic a priori*, for Kant, were judgments that were true on the basis of reason alone but yet not simply true by definition. They were also "expansive" of their subject. Kant's writings provided an extended analysis of how this can be and also why it is important. It is important because ideas that are *synthetic a priori* are the basis of judgments that are objective. The positivists' absolute dichotomy between subjective and objective knowledge or phenomena is simplistic nonsense. All judgments, Kant pointed out, are initially only subjective; they are ours alone, individually. Judgments become objective (for us in communities) when we learn to frame or describe them with categories that are universally shared, meaning that they have the same meaning for all possible users. Not all categories can be shared universally in this way. It depends on their logic. The logic of the idea of time is very different from the logic of the idea of taste. Those that can be shared this way are the categories that are *synthetic a priori*. It is perfectly clear in Kant's writing that inventing and establishing such categories is a social process, and that using them is therefore a social-psychological process. Kant's own analyses show how the basic ideas of mathematics and morality are of this kind. The ideas of geometry, precisely because they have the property of being a self-consistent logical system that is the same from the perspectives of all users, generate a geometrical space that, in use, is the same for all users. Kinship idea-systems work in exactly the same way. Precisely because they have the property of being self-consistent logical systems that are the same from the perspectives of all users, they each can be used to generate a kinship space in use that is the same for all users. In *Human Organizations and Social Theory* I have argued that social idea systems, in general, are of this kind (2009: 44-56). *Human Thought and Social Organization* shows this for kinship idea-systems, in particular, with what we hope will be absolutely inescapable completeness and thoroughness.

The third contribution is the body of scholarship on the development of Roman law that Morgan assumed and that provided his theoretical framework. Elsewhere I have described the substance of the debate on law and its relevance to later social theory in general (Leaf 1976). Here the point is that this theory was not just about Roman law; it also was part of it. Roman law incorporated its own very sophisticated explanation of what law was in general just in the way that Sanskrit, as Europeans discovered it, embodied its own theory of what language in general was. In this Roman theory, law had the same fundamental properties that we have found in idea systems in general. It is based on a structure of ideas and it is powerfully generative. It is also pluralistic, by itself. Roman law was divided into two main bodies with contradictory principles: *connubium*

and *commercium*. Each had a single core image. For *commercium*, it was the idea of making a contract. For *connubium*, it was the household based on the *patria potestas*. Unfortunately, while the Romans themselves were clear that the purpose of the law was to maintain this one particular kind of family system as opposed to others that some segments of the population were seeking to replace it with, Maine, Morgan, and Köhler drifted into opposed versions of the position that for early states of society the reverse was true: that there had been only one family system and it generated the law.

For me, the next major contribution is Malinowski's idea of a social charter. But this is only as it was imbedded in his several Trobriand monographs, not as he tried to explain it in general terms (Malinowski 1944). Laura Bohannan (1952) and Paul Bohannan (1957) provided the better general formulation—not incidentally in connection with the analysis of legal systems.

The next step after this was a string of arguments from E. R. Leach. Leach had an exceptional knack for finding and describing idea systems of many kinds. These included social idea systems. But in the end, like Malinowski, he could not accept the implications of what he found for his positivistic idea of theory. One of the two most salient analyses for what we now understand kinship systems to be is his 1954 description of Kachin *Gumsa*, Kachin *Gumlao*, and *Shan* as three opposed patterns of social organization, all in use in the same area in the Chin Hills of Burma. He was absolutely clear that they were all reported simultaneously for the same people in exactly the same communities. They thus could not possibly have been structures in the sense of quasi-physical all-encompassing wholes that people were “in.” They could only have been standardized cultural models that people used in their interactions. Leach recognized this, and he also recognized that this was exactly the opposite of what then current theory—positivistic theory—claimed social organization to be. So he concluded that his account was description but not theory. Another important contribution, in his *Rethinking Anthropology* (1961), was his observation that it was possible to compare systems of representation topologically rather than absolutely. When we say that a kin term map is isomorphic to a kinship map, it is in this sense.

Fred Bailey took the next step. *Tribe, Caste, and Nation* (1960) described the things named in the title as “structures” existing in “the same social field.” But instead of dismissing this as mere description and not theory, he asked what kind of theory this supported. Flatly rejecting the idea of a monolithic whole and the determinism that went with it, he argued for recognizing their separateness and seeing it in the context of purposive, choice-making, rational actors. At about the same time, Frederick Barth in his 1959 game-theory analysis of Swat Pathan factionalism and T. S. Epstein in her 1962 analysis of the different strategies behind the reactions to irrigation in two Indian villages had made similar cases for instrumental rationality and had recognized the existence of multiple organizations implicitly, but had not so clearly separated them out or called attention to their implications theoretically.

Finally, I should mention a work of my own that I have not published, but was an important early test of the basic idea that social idea systems were probably a good deal more salient ethnographically than “concrete behavior.” This was my master's thesis at

the University of Chicago, written as a student of David Schneider (Leaf 1963). Schneider at the time was writing his *Some Muddles in the Models* paper on the alliance-descent controversy (Schneider 1965). His argument largely revolved around Needham's arguments in *Structure and Sentiment* (1962). Needham's argument was based on a reanalysis of an ethnography of the Purum community in Manipur State, India, by Tarak Chandra Das. Das's monograph gave good detail on kinship ideas, including the kinship terminology (in the sense of a list of terms and glosses), as well as a nearly comprehensive set of family genealogies showing actual marriages.

The Purum said they had a rule of matrilateral cross cousin marriage. They also said that they were divided into what Das called "sibs" and each sib received wives from one or more other sibs and gave wives to one or more other sibs on the basis of this cross-cousin rule. There were four sibs, crosscutting the four Purum villages. This kind of marriage pattern ought to result in some kind of marriage in a circle. At the same time, however, the marriage ceremonies placed a great deal of emphasis on what looked like hypergamy—the bride was being married to a man of higher status. This is a common pattern among the relatively small group of societies with such a marriage rule, and creates a logical problem that was a central focus of Claude Lévi-Strauss's *Elementary Structures of Kinship* (1949). That is, if we have four groups, A, B, C, and D, and A gives wives to B, B to C, and C to D, then by the matrilateral rule D must give wives to A. But by the rule of hypergamy, D logically should be higher in rank than A (since D is higher than C and C is higher than B and B is higher than A). So we have a contradiction. Either matrilateral rule is contradicted or the rule of hypergamy is contradicted. Lévi-Strauss resolution was to argue that the hypergamy was only with respect to the perspective of each group, not the whole society. He described his analysis as "idealistic" rather than objective or "naturalistic." Needham's argument was that the Purum data supported Lévi-Strauss's argument for alliance theory rather than the supposed alternative arguments for descent theory. The two rules were not consistent for the entire community, which descent theory would require, but were consistent from the point of view of any one pair of sibs, as alliance theory maintained. For the community as a whole, the sibs could be seen to consist of a number of lineages that exchanged wives in stable three-lineage "cycles," which was also consistent with alliance theory. Therefore, he argued, alliance theory provided an analysis of Purum as a "total social system" of general exchange among the lineages that were the present day embodiment of the formerly solitary sibs.

I took a close look at Das's data and found something quite different. The "hypergamy" was not a sib or lineage relationship at all. It was a display of a particular Purum concept of "age" that used ideas from the kinship terminology. Age in this sense was a characteristic of an individual only, not in any way of an entire sib or any other kin group. A series of ceremonies in the village that Das described as connected with the "sib and family god" involved displays of great respect for individual men. Marriage ceremonies and funerals were part of this sequence, in the sense that they had the same general cast of characters and represented the same constellation of ideas. In all of these ceremonies, the man who is being shown respect was addressed with the kin-term *apu*. In a mar-

riage ceremony, the *apu* was the girl's father. So a key question was "What is the reciprocal of *apu* in the rituals where *apu* is the central object of attention?" The answer was that it was his *maksas*. *Maksas* were a class of relations that included "husbands of the daughters of the family of all generations preceding and succeeding" (1945: 50). This included own daughter's husbands and younger brother's daughter's husbands, but not older brother's daughters' husbands, which would have been the case if it were a sib or lineage relationship. But some *maksas* were "better" than others. The better *maksas* were the husbands of daughters progressively lower in the line of descent. So essentially, a person was marked as *apu* by the presence of heads of families in his own individual descent line (not clan or lineage) junior to himself. The younger and more junior his *maksa* group, the older and more respectable he must be. Such ceremonies were displays of "age" in terms of a conceptual model in which moving up in the birth-order hierarchy of the village was the same as moving up in respectability in the village. My conclusion was that neither theory could be applied without serious distortions of the data and this is what Schneider reported (Schneider 1963: 69), albeit without explanation.

### **Conclusion**

Considering both the steps leading to the discovery of kinship idea-systems and the recurrent errors that led so many away from it, it is clear that the process of discovery in this case is nothing like the conventional view of scientific progress as coming from "break-through" solutions to well recognized and highly focused questions, like the speed of falling bodies, the shape of planetary orbits, the nature of biological inheritance, the speed of light, or the structure of DNA. There was no race to find kinship idea systems. Instead there was a confused field of people running in many different directions toward many different goals.

Read and I have done the main work, along with contributions by Fischer. Although each of us has drawn on many others, in somewhat separate networks of associations, the main adjustments we have made in our respective contributions specifically to the description of kinship systems have been to each other. At the same time, however, I should add that while our work has converged, it has not merged. Each of us has provided a piece of the total analysis that the others could not. Because of the complexity of the phenomenon and the range of skills we have had to mobilize in dealing with it, I expect this kind of team approach will continue to be necessary in the future.

The focus on kinship is justified. There is something there. It has stayed there through all the confusion. Now we can see what it is. The problem is to be clear about it and see where it takes us.

### **References**

- Bailey, F. G. 1960. *Tribe, Caste, and Nation*. Manchester: Manchester University Press.
- Barth, F. 1959. Segmentary opposition and the theory of games: A study of Pathan organization. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 89:5-21.
- Bohannan, L. 1952. A genealogical charter. *Africa* 22:301-305.



- Bohannon, P. 1957. *Justice and Judgment Among the Tiv*. London: Oxford University Press.
- D'Andrade, R. 1995. *The Development of Cognitive Anthropology*. Cambridge: Cambridge University Press.
- Das, T. C. 1945. *The Purums: An Old Kuki Tribe of Manipur*. Calcutta: University of Calcutta.
- De Angulo, J. 1925. Taos kinship terminology. *American Anthropologist* 27:482-483.
- Epstein, T. S. 1967. *Economic Development and Social Change in South India*. Manchester: University Press. First published 1962.
- Leach, E. R. 1954. *Political systems of highland Burma: A study of Kachin social structure*. Cambridge: Harvard University Press.
- \_\_\_\_\_. 1961. *Rethinking Anthropology*. London School of Economics Monographs in Social Anthropology no. 22. Reprinted 1968. London: The Athlone Press.
- Leaf, M. 1963. "Age" in Purum Social Structure. M.A. Paper. University of Chicago.
- \_\_\_\_\_. 1971. The Punjabi kinship terminology as a semantic system. *American Anthropologist* 73:545-554.
- \_\_\_\_\_. 1972. *Information and Behavior in a Sikh village*. Berkeley: University of California Press.
- \_\_\_\_\_. 1979. *Man, Mind and Science: A History of Anthropology*. New York: Columbia University Press.
- \_\_\_\_\_. 2001. "Schneider's idealism, relativism, and the confusion of kinship," in *The Cultural Analysis of Kinship: The Legacy of David M. Schneider*. Edited by R. Feinberg and M. Ottenheimer, pp. 60-77. Urbana: University of Illinois Press.
- \_\_\_\_\_. 2006. Experimental analysis of kinship. *Ethnology* 45:305-330.
- \_\_\_\_\_. 2009. *Social Organization and Social Theory*. Urbana: University of Illinois Press.
- Leaf, M. and D. Read. 2012. *Human Thought and Social Organization: Anthropology on a New Plane*. Lanham: Lexington Press.
- Lévi-Strauss, C. 1969[1949]. *Elementary Structures of Kinship*. Boston: Beacon Press.
- Lowie, R. 1930. The kinship terminology of the Bannock Indians. *American Anthropologist* 32:294-299.
- Malinowski, B. 1944. *A Scientific Theory of Culture, and other Essays*. Chapel Hill: Chapel Hill Press.
- Needham, R. 1962. *Structure and Sentiment: A Test Case in Social Anthropology*. Chicago: University of Chicago Press.
- Neurath, O. 1959. "Sociology and physicalism," in *Logical Positivism*. Edited by A. J. Ayer, pp.165-198. Glencoe: The Free Press. First published in *Erkenntnis* 2:1931/2.
- Read, D. 1974. "Kinship algebra: A mathematical study of kinship structure," in, *Genealogical Mathematics*. Edited by P. Ballonoff, pp. 135-161. The Hague: Mouton Press.
- \_\_\_\_\_. 1984. An algebraic account of the American kinship terminology. *Current Anthropology* 25:417-449.

- \_\_\_\_\_ 1993. Introduction. *Journal of Quantitative Anthropology* 4(2).  
<http://www.quantitativeanthropology.org/index.php?journal=QA>
- \_\_\_\_\_ 2000. Formal analysis of kinship terminologies and its relationship to what constitutes kinship (complete text). *Mathematical Anthropology and Cultural Theory* 1.  
<http://www.mathematicalanthropology.org/pdf/MACTREAD1100.PDF>
- \_\_\_\_\_ 2001. "What is kinship?," in *The Cultural Analysis of Kinship: The Legacy of David Schneider and Its Implications for Anthropological Relativism*. Edited by R. Feinberg and M. Ottenheimer, pp. 78-117. Urbana: University of Illinois Press.
- \_\_\_\_\_ 2006. Kinship Algebra Expert System (KAES): A software implementation of a cultural theory. *Social Science Computer Review* 24:43-67.
- \_\_\_\_\_ 2007. Kinship theory: A paradigm shift. *Ethnology* 46(4):329-364.
- Read, D. and C. Behrens. 1990. KAES: An expert system for the algebraic analysis of kinship terminologies. *Journal of Quantitative Anthropology* 2:353-393.
- Romney, A. K. and R. D'Andrade. 1964. "Cognitive aspects of English kinship," in *Transcultural Studies in Cognition*. Edited by A. K. Romney and R. D'Andrade, pp. 146-170. Menasha: American Anthropological Association.
- Schneider, D. 1965. "Some muddles in the models," in *The Relevance of Models for Social Anthropology*. Edited by M. Banton, pp. 25-85. New York: Taplinger.
- \_\_\_\_\_ 1968. *American Kinship: A Cultural Account*. Englewood Cliffs: Prentice Hall.
- \_\_\_\_\_ 1969. Componential Analysis: A State-of-the-Art Review. Paper presented at the Wenner-Gren Symposium on Cognitive Studies and Artificial Intelligence Research, March 2-8. University of Chicago Center for Continuing Education.
- \_\_\_\_\_ 1987. *A Critique of the Study of Kinship*. Ann Arbor: University of Michigan Press.
- \_\_\_\_\_ 1995. *Schneider on Schneider: the Conversion of the Jews and Other Anthropological Stories*. As told to Richard Handler. Durham and London: Duke University Press.
- Vatuk, S. 1972. Kinship terminology in northern India. *American Anthropologist* 74(3):791-793.