Marriage networks among Australian Aboriginal populations

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Pre-publication draft, published in *Australian Aboriginal Studies* 1997 (2): 2-23.

Most people do not marry people who are too close, household members for example. However, nor do they marry people who are too far, such as total strangers for themselves or their family. In other words, they typically marry people with whom they have some sort of previous connection. In certain post-industrial settings, and perhaps elsewhere as well, prior linkages relating to employment, schooling, religious affiliation and so on undoubtedly intervene in the orientation of marriage choices. However, in most places, most of the time, such considerations remain subordinate to the role played by other types of relationship, namely those deriving from kinship and marriage themselves. In short, as a general rule, most people marry people with whom some sort of direct or indirect kinship or in-law relationship already exists.

This common-place observation has far-reaching implications. As many of the previously related spouses of each generation give birth to children who themselves marry persons with whom they are directly or indirectly related, a higher-order social entity comes into being: a dense network of interlocking consanguinal and affinal ties. Such a network can be likened to a particularly complicated tangle of strings (of consanguinity) knotted together (by marriages) in a variety of ways to form a single intricate, unravelable whole. This higher-level entity persists through time, not as a static configuration but as a continually unfolding one in which certain connections are forgotten, others are renewed and new ones are forged. Developing in accordance with changing circumstances, it is shaped, generation after generation, by the aggregate influence of antecedent marriages upon the determination of marriages to come. Such a network thus embraces, in an approximate yet unmistakable fashion, the evolving social field in which individuals are embedded and though which their past and future are indissociably bound.

The study of marriage networks favours an approach to kinship and marriage in which primary emphasis is given neither to classificatory schemes nor to normative precepts, but to the patterning of actual consanguinal and affinal connections. Douglas White and I have tried to show elsewhere (Houseman and White 1996, 1997, in press; White and Houseman n.d.), notably with regard to a number of Amazonian and South Asian populations, the value of such a perspective. The intention of the present paper is to outline certain aspects of this approach and to apply it to the study of Australian Aboriginal societies. It aims to suggest some of the advantages of thinking about Australian Aboriginal identities and social organisations with such higher-order matrimonial 'tangles of string' in mind.

This paper is divided into four parts. An initial section deals with the delimitation and the representation of marriage networks in general. A second introduces the concept of the marriage network core and introduces a number of Australian Aboriginal marriage networks. A third section presents some additional cases and considers certain general characteristic features of Australian Aboriginal marriage networks. A fourth section explores the notion of matrimonial community in light of the preceding discussions.

Isolating and representing marriage networks

Marriage networks are composed of two basic types of links: kinship connections and marriage ties. These are combined in divers ways to form 'paths' leading from one genealogical point to another. Such paths may be thought of as lengths of (consanguinal) string joined together by (matrimonial) knots. One such path for example might lead from me (Ego in Figure 1) through my father S and his sister T to my cousin A (string), to his wife B (knot), from there to her sister C (string), then to her husband D (knot), to her husband's uncle E (string), to his wife F (knot), to his wife's brother G (string), et cetera. Another might lead from my cousin's wife's sister's husband D, to his nephew H, to the latter's wife I, to her aunt J, and to her aunt's husband K, who, by another path (K-C-D) is also D's brother-in-law. Another path might lead from D's brother-in-law K to his wife's niece L, to her husband M who is also my brother's son. Still another might lead from my brother's son M back to me through his wife L, who is the niece of my own wife N, and so forth. The sum of all such criss-crossing paths constitutes the marriage network.

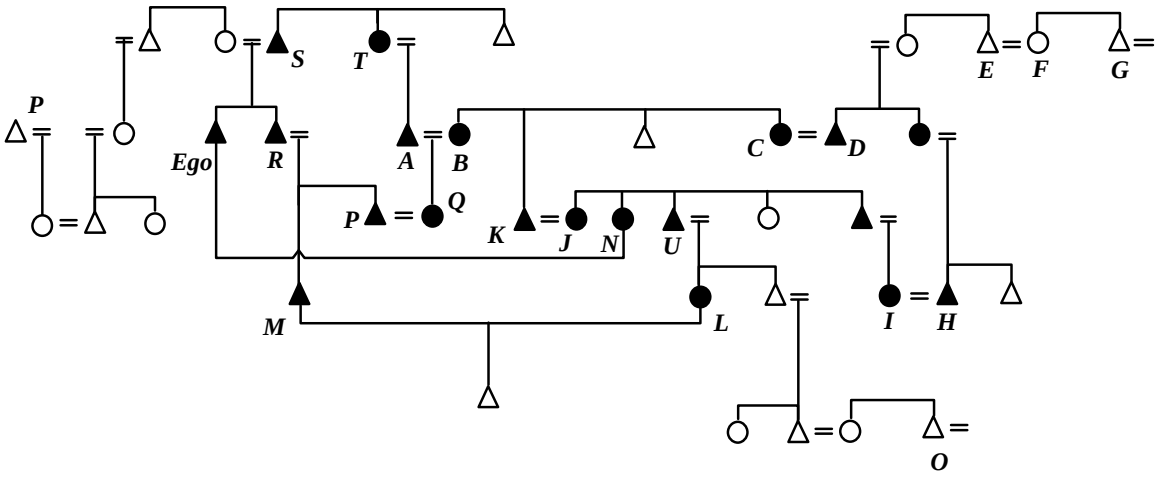


Figure 1
Sample network, conventional notation

In any real situation, the paths that compose a marriage network will not only be fairly numerous, they may also be very wide-ranging. Thus for example, it is not unlikely that most if not all of Aboriginal Australia can be united in a single ramifying web of intermarriages. In this respect, the affirmation frequently heard among Aboriginal people that 'we are all related' may well be true.[1] Indeed, given the fact that racial, ethnic, national or continental boundaries are never completely sealed off for all time, marriage networks of Australia-wide or even global proportions are not out of the question. However, the kinds of marriage networks we are primarily interested in are of a lower order of magnitude.

Continent-wide or region-spanning marriage networks are far from homogeneous. They contain lumps (and lumps of lumps), that is, zones where generations of persons marrying neither too close nor too far have resulted in a definite clustering of intermarriages. It is these more restricted marriage networks, characterised by a high concentration of cross-cutting affinal ties, that we are

concerned with here. Such matrimonial clusters generally do not exceed several hundred or at most several thousand living individuals, and are typically (but not necessarily) associated with some type of collective identity relating to co-residence, shared language, custom or history, common links to land, et cetera.

It is worth pointing out however that regional, continental or global marriage networks remain for the most part undocumented. As a result, delimiting such a smaller-scale marriage network does not so much consist in extracting it out of the larger genealogical context in which it is embedded as building it up from a series of fragments provided by a variety of informants. As any field-researcher can attest, this is in no way a straightforward or automatic process. It invariably entails a number of selective criteria in the light of which certain persons (for example the individual K in Figure 1) may be deemed to occupy a more central position than others (such as the individual E in Figure 1). The nature of the genealogical fragments elicited as well as the extension and depth of the network they are assembled into, will vary from one case to the next, largely as a function of the analytical orientations and practical concerns of those undertaking the research, and as constrained by the accessibility of data. In this respect, the marriage networks we will be dealing with are motivated entities rather than objectively given ones: they are determined relative to special theoretical and pragmatic considerations.

Marriage networks are culturally constructed as well. On the one hand, the nature of the data gathered is conditioned by the particular interests of the informants consulted. Indeed, the unitary ordering of genealogical material in the form of a marriage network represents but an approximate co-ordination of a multitude of particular actors' points of view. More importantly, however, the selection of kinship and marriage ties is often the result of various types of constructive processes whereby the links in question are manufactured. In other words, marriage networks rely upon local conceptions of kinship and marriage: the links themselves are interpersonally and culturally defined. Thus, the isolation of a marriage network does not assume or require that the connections involved be true, or biological, or even agreed upon. Different links may be imputed by different actors or different sources. There may be multiple alternate constructions of kinship and marriage networks in a given setting, and the links entailed may include imputed biological maternity or paternity, adoption, sociological parenting and so forth. Nor need we assume that consanguinal and affinal ties are purely ascribed ones: indeed, not only marriage but the imputation of culturally valid kinship links of all types may change over time, may be achieved, performative, et cetera. In short, our prime concern is not with reproduction per se, but with the socially reproductive relationships internal to the social field delimited by the marriage network.

The marriage networks we will be dealing with, then, are not only truncated, both temporally and in terms of the more far-ranging relationships in which they are embedded; they are also constructed, both observationally and culturally, from particular points of view. Yet it is precisely this cultural construction of kinship in a selective setting that is of interest here. The kinship networks are dynamic, with considerable internal variability over time and as to the imputation of links by different sources for different actors. Yet at the same time, the utility of being able to identify shifting or emergent patterns amid this flux of constructive activity becomes all the more apparent. Thus, marriage networks are approached here as encompassing in a more or less comprehensive fashion certain matrimonial universes, the specific properties of which can be legitimately explored. Indeed, our aim is to analytically

transcend the diversity of points of view inherent in the construction of a delimited marriage network in order to envisage such clusters or 'lumps' not as collections of interconnected fragments, but as distinct totalities.

From this standpoint, it is helpful to invert certain aspects of conventional anthropological notation. Thus, in keeping with the strings-and-knots metaphor introduced above, marriages will be indicated henceforth by points, and male and female individuals by different types of lines, for example solid and dotted lines respectively, linking these points (see Figures 2a and 2b). The passage of time is shown as proceeding from top to bottom: lines converging downwards to a same point correspond to spouses (plural marriages are indicated by several lines emanating from a same point), whereas lines radiating downwards from a same point correspond to a set of siblings.[2]

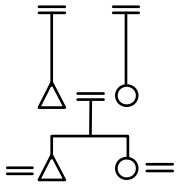


Figure 2a
Conventional notation

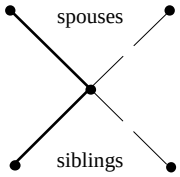


Figure 2b
Network notation

Figure 3 presents the marriage network of Figure 1 using this alternative notation.[3]

Figure 3
Sample network, network notation

As this graphical convention should make clear, the perspective advanced here shifts the analytical focus away from the way in which individuals are related to each other by marriage, to the manner in which marriages may be said to be organised amongst themselves. Indeed, according to our view, the matrimonial arrangements included within a delimited marriage network do not represent a simple assemblage of individual (or collective) initiatives, but a dynamic co-ordination of such initiatives, co-ordination whose emergent features pertain to the patterning of the circumscribed marriage network as a whole.

The Core of the marriage network

Our analysis, then, is concerned above all with the connective features of marriage networks as such: how marriages are linked to each other to form larger systems of interrelationship. In order to grasp such systems, only married persons within the network, and even then, only certain of these married persons, need be taken into consideration.

The notion of a marriage network as a distinct higher-order entity is grounded in the fact that many of the marriages it incorporates take place between people who are at the same time connected to each other by some other type of kinship and/or affinal tie. To speak of the organisation of such a network is to speak above all of the nature of these other ties and the extent to which they may be said to influence

marriage choices: Do marriages often take place between consanguines, and if so, between what type? Do they often take place between in-laws of in-laws, and if so, between which ones? and so forth. Now, such questions can only apply to those marriages between the partners of which additional kinship and/or affinal connections effectively exist; they can not apply to marriages where such connections are absent or unknown. To illustrate this distinction, consider the network shown in Figures 1 and 3. It contains a number of marriages whose partners are also joined to each other by other consanguinal or affinal ties. The paths that trace out these additional ties have been indicated by shading (of individuals in Figure 1 and of marriages in Figure 3); those that do not have been left unshaded. It can be seen that the former, shaded paths are closed. Together, they form a sub-set of the overall network in which each marriage is connected to every other marriage in at least two different ways. This sub-set corresponds exactly to the concept of 'block' in graph theory: a maximal sub-graph where every pair of points lies on a circuit (Gibbons 1985). Under these conditions, questions concerning the interrelationship of marriages may be legitimately entertained. On the other hand, the latter, unshaded paths remain open: beginning somewhere within the network, they lead, at is were, nowhere. In these cases, where marriages are connected to others in one way only, queries regarding their interrelationship are trivial. In other words, from the point of view of the form of the marriage network, unshaded, open genealogical paths are superfluous. The individuals/marriages which compose them are not sufficiently articulated with the rest of the network to allow us to say anything beyond the fact that they are indeed part of it. What is true of our sample network is also true of any empirical marriage network: there will always be a proportion of individuals/marriages lying along paths that do not form circuits. As such, they will be excluded, along with unmarried individuals, from analyses of marriage network organisation.

The marriages that compose blocks and their connections within the overall marriage network constitute what we may call the 'core' of the network: that sub-set of marriages having a sufficient degree of interconnectedness to enable one to speak meaningfully of network structure.[4] Core (block) marriages may be described as 'relinking' marriages (renchaînements in French, see Jolas et al. 1970, 19-22; see also Segalen 1985): they are linked to each other and link individuals to each other in at least two different ways. In Figures 1 and 3, the marriage of Ego's brother's son M to L for example relinks in several respects: L is the niece of M's father's brother's wife N, who is also the sister of J, the brother of M's father's father's sister's son's wife B, who is also the mother of M's brother's wife Q, et cetera. Certain of the genealogical circuits formed by the relinking marriages of the core may incorporate a single affinal (husband-wife) tie; such is the case for example of the circuit Ego-R-P-Q-A-T-S-Ego. Other circuits may entail two, three or more affinal connections. For example, the circuit Ego-N-U-L-M-R-Ego includes two affinal ties (Ego-N and L-M), whereas the circuit Ego-N-J-K-B-A-T-S-Ego contains three such ties (Ego-N, J-K and B-A). The first type of circuit (one affinal tie only) describes a consanguineous union or kin marriage; the second corresponds to what Héritier (1981) has called a 'redoubling' of alliance (redoublement in French); the third has been labelled a 'ternary cycle' (Guinard 1984; Cazès et Guinard 1991), a 'co-affinal marriage' (Houseman and White 1996), et cetera. A consistent vocabulary for talking about such things has yet to be established. Nevertheless, one point should be clear: in the perspective adopted here, consanguineous unions represent but a special, limiting case of the more general

phenomena of affinal relinking (see Viveiros de Castro 1993; Houseman and White 1996).

As our simplified example suggests, the web of genealogical connections within the core is a very dense one. For most of the individuals in the core, the others it contains are either (cognatic) kin, in-laws or in-laws of in-laws of some sort or another. The core (block) represents what Brudner and White (1997) have called a unit of 'structural endogamy'. Endogamy is usually construed as referring to marriage between persons who have certain characteristics in common: members of the same family, of the same clan or tribe, of the same category or caste and so forth. However, in the case of structural endogamy, the delimitation of the endogamous entity derives not from the fact that the persons it contains are of a similar nature, but that the matrimonial relationships between these persons are homologous: they form circuits. Thus, while not all core marriages are between core individuals (consider for example the marriages of Ego's father and of D's sister in Figures 1 and 3), all such marriages are joined to all other marriages in the core along closed genealogical paths. In short, in the case of structural endogamy, endogamy is defined in purely sociological (rather than implicitly biological) terms. It is worth noting, however, that by concentrating in this way not upon resemblances between persons but upon systematic connections between marriages, we have displaced our analysis to a higher level of abstraction. The nodes or constituent elements of an actual marriage network are of course individuals, linked to each other by relations of marriage. However, when we focus exclusively upon the core of such a network, this situation is reversed, as indicated by the alternative graphical notation employed above. It is the marriage relations themselves that become the nodes, the individuals representing the relations between them. In this sense, the marriage network core envisaged as a distinct totality may be thought of as a higher-order relationship between relationships (of marriage). It is an abstract or theoretical entity rather than an strictly empirical one: a pattern of relationships rather than a collection of persons.

The reduction of a marriage network to its core is a formal procedure, in itself independent of the peculiarities of the populations concerned. However, this reduction is also informed by the nature of the delimited network from which the core is derived, the characteristics of which are linked to the specificities of the cases under consideration. As has been mentioned, the availability of genealogical material, the researchers' theoretical leanings, the informants' interests, et cetera, invariably condition the selection of individuals/marriages to be included within the clustered marriage network. Thus, not only the extension of this network but also the proportion and types of genealogical paths that will be excluded from its core will depend in part upon these additional empirical and analytical factors.

Figure 4a
Alyawarre, network

Figure 4b
Alyawarre, core

A clear example of how a researcher's preoccupations can influence the nature of the data collected is Denham's (1976) careful study of an Alyawarre community around Lake Nash. Figure 4a shows the marriage network resulting from his genealogical survey (318 marriages), Figure 4b the core of this network (123 marriages); males are represented by solid lines, females by dotted lines. Denham's main concern is with patterns of interaction within the local group. As a result, genealogical paths leading beyond this group, mostly though out-marrying women (the

numerous dotted lines leading to the right of Figure 4a) are largely ignored. It is thus difficult to know for example the extent to which the kinsmen of such women's spouses, or the kinsmen of the spouses of the kinsmen of such women's spouses, do not in fact regularly marry back into this same local group. If such paths had been included and if a fair proportion of them did indeed form circuits, the core would have been both considerably larger and denser.

Figure 5a
Groote Eylandt Winindiljangwa, network

Figure 5b
Groote Eylandt Winindiljangwa, core

A rather different picture emerges from Rose's (1960) data for the Groote Eylandt Winindiljangwa, later extended by Peter Worsley in 1952/53 (Worsley 1952/53). Figure 5a shows the marriage network (287 marriages), Figure 5b the core (101 marriages); males are represented by solid lines, females by dotted lines. Rose focused his survey on living individuals such that, in this case, the missing data are not so much affinal and lateral as they are consanguinal and vertical. Indeed, the absence of genealogical information concerning higher generations results in a fairly shallow core composed for the most part of unrelated sibling groups. In no cases for example do lines of agnatic descent extend beyond two generations. The Alyawarre material, we have remarked, makes it difficult to properly assess the extent and the nature of relinking marriages, that is, unions between persons connected by pre-existing affinal ties. The Groote Eylandt data makes it difficult to evaluate rates of consanguinal marriage. It becomes more feasible to do so, however, in the light of White and Jorion's (1996) re-examination of Rose's (and Worsley's) work. Drawing upon a 'further compilation of kin relations using names of deceased parents, comments about prior marriages and marginal notes about relatedness', (p. 24), they were able to produce a much fuller network the core of which contains 319 marriages (Figure 6).

Figure 6
Groote Eylandt Winindiljangwa, expanded core

The transition from a marriage network based on already compiled genealogical data to its core may entail a loss of up to two thirds of the marriages surveyed. This is so because genealogical materials have generally not been collected with marriage networks in mind. Indeed, it is only recently, with the help of computers, that large-scale systematic accounts of real kinship connectivities have become feasible at all. Ideally, a genealogical sample should circumscribe a matrimonial cluster as closely as possible. The closer it does so, the lower the number of paths that do not form circuits and thus the lower the proportion of marriages that will be lost when the sample is reduced to its core. The lower the number of marriages lost in this way, the more the core may be said to be representative of the entire network. Inversely, to the extent that a genealogical sample encompasses only part of a matrimonial cluster or partially overlaps several such clusters within a larger regional network, the number of paths that do not form circuits will be higher, as will the proportion of marriages lost during core reduction. It should be emphasised, however, that a sizeable loss, while regrettable, is hardly catastrophic. Core reductions are important because they allow one to grasp certain recurrent features of the network as a whole. But these features are more a matter of form and pattern than of quantity. For this reason, the core need not be very large for such structural features to become apparent. Nor do these features need to be overwhelmingly present in order for them

to orient the organisation of the marriage network in a significant fashion. Thus, while it is difficult to speak in general terms of a minimum, maximum or optimal core size, as this will vary from one case to the next, concretely, a core must be:

1. large enough for the regularities it contains to be both noticeable and statistically meaningful, and
2. representative enough of the entire network that these regularities may be supposed to significantly inflect the network's overall development.

Ethnographic familiarity with the populations concerned obviously plays an important role in such evaluations.

Materials based on household censuses alone for example are almost never sufficient. A case in point are the lists of kinship and marriage relations within the mission settlements of Kalumburu and Mowanjum (Kimberley region of Western Australia) supplied by Lucich (1987, see also 1968) in order to 'show how actual genealogical links relate to the intercategory connections' (1987, 453). The one hundred or so marriages surveyed in Mowanjum in 1963 reduce to a core of nine unions only, whereas the 'immediate kin relations' given for Kalumburu community provide no core whatsoever.[5] Nor is any core to be found for example in the circa 1950 data contained in Falkenberg and Falkenberg's (1981) analysis of the affinal relationship system among the Murinbata of Port Keats mission in the Northern Territory (compiled by C. Gegenworth). A final negative example is Rose's (1961) ill-fated census undertaken among the Pitjantjatjara of Central Australia: as a result of the latter's reluctance to provide the names of deceased ascendants, there is no core nor indeed any network to speak of in the data he collected. On the other hand, the extensive published and (mostly) unpublished material resulting from systematic genealogical investigations undertaken within the context of land claims or otherwise (see for instance Doreen Kartinyeri's formidable work in progress [1983, 1985, 1989, 1990]), provide comprehensive marriage networks with extensive cores for both 'remote' and 'settled' Aboriginal groups. Tilbrook's (1983) Nyungar family trees for the Aboriginal population of South-western Australia from 1829 to 1914, the core of which is shown in Figure 7 (337 marriages, females being represented by solid lines, males by dotted lines) is a case in point.

Figure 7
Nyungar family trees, core

Finally, there is a question of scale. Thus for example, within the core of the Nyungar marriage network shown above (Figure 7) are a number of lower-level loci of heightened endogamy. For example, in most of the core marriages referring to the family trees 1, 2, 3, 4, 5b, 9, 10c, 16, 18 and 30 in Tilbrook (1983), both spouses originate from these same family trees. According to a member of one of these families, this is hardly surprising: the majority of the individuals included in these genealogies have a common reference to the region of South-western Australia roughly corresponding to the Wilman territory on Tindale's (1974) tribal map. What we may call the Wilman marriage network core, shown in Figure 13, is thus encompassed within the larger Nyungar core, itself in all likelihood encompassed within still higher-order networks of intermarriage. In short, the identification of marriage network core is a relative one.

As the examples above (and below) show, clustered marriage networks having significant cores are usual features of both past and present-day Australian Aboriginal

populations. But what of the organisational features of such networks? In what ways do Aboriginal marriage networks, regardless of the situation in which genealogical data is assembled, differ from non-Aboriginal ones? In short, do Aboriginal marriage networks have any common characteristics?

Do Aboriginal marriage networks have any distinctive features?

One of the values of core reduction is that it provides the basis for a rigorous comparison between marriage networks compiled from material gathered under very different circumstances and with different theoretical or practical preoccupations in mind. Delimited marriage networks themselves may be highly variable both in kind and in extension. However, by reducing these networks to their respective cores, identical conditions of connectivity are imposed upon them: only their closed genealogical paths are taken into account. If no such paths exist in a given marriage network, then this network has no core and a structural comparison with other networks is not possible. However, where marriage network cores do exist, this communality provides a shared framework, namely that of structural endogamy, within which their respective modalities of affinal relinking can be directly compared. Resemblances and divergences relating to the patterns that underlie the formation and the concatenation of their component circuits can be precisely evaluated.

Australian Aboriginal marriage networks show a marked tendency towards dual organisation. More precisely, they manifest a pattern that Douglas White and I have elsewhere called 'sidedness' (Houseman and White 1996, 1997, in press): an ordering of alliances such that the marriage network can be exhaustively or overwhelmingly divided into two intermarrying super-sets of patrilines (and/or matrilines).[6] In the event of 'viri-sidedness', a man's marriage is on the same side of the matrimonial partition as his parents' marriage, his brothers' marriages, his father's brothers' marriages, et cetera. On the opposite side are the marriages of his sisters, his father's sisters, et cetera, and the marriages of his wife's parents, her brothers, her father's brothers, et cetera. 'Uxori-sidedness' consists in the inverse pattern: a woman's marriage is on the same side as the marriages of her parents, sisters, mother's sisters, et cetera.

Table 1 shows the rates of viri-sidedness and uxori-sidedness for a series of Aboriginal marriage network cores, some of which are represented in Figures 8-11 (in the viri-sided Figures 8 and 10 males are represented by solid lines and females by dotted lines; in the uxori-sided Figures 9 and 11 this is reversed). All of these networks are based on published materials, except for 'Expanded Oodnadatta' which is based on M. Moisseeff's 1993-5 field notes (see infra); as previously mentioned, the 'Wilman' network is derived from a sub-set of the Nyungar genealogies contained in Tilbrook 1983. A number of non-Aboriginal marriage networks have also been included for comparative purposes. The first group concerns populations from South Asia and from Amazonia, regions where sidedness is also commonly found: the Garo of Assam and the Gangadikara Vokkaligas of Mysore on the one hand, the Akwe-Shavante and the Yanomamo on the other. The second group includes a variety of populations among whom sidedness is conspicuously absent: two European groups, the rural Canadians of St. Gabriel and the Irish Tory Islanders, the Wampar of Papua New Guinea, the Polynesian Anutans, the Torres Strait Islanders of Badu Island and the African Uladen Tuareg.

Table 1
Rates of sidedness for a variety of Australian Aboriginal and other populations

Population (N° core marriages)	Viri-sidedness		Uxori-sidedness	
	Rate	Statistical significance p<	Rate	Statistical significance p<
Expanded Groote Eylandt (319)	100%	.000000000000000...	64%	.000005
Groote Eylandt (101)	100%	.000000000002	78%	.00002
Alyawarre (123)	98%	.00000000000000005	95%	.00000000000003
Andyamathanha (126)	60%	.04	92%	.0000000000000002
Wilcannia (75)	78%	.001	75%	.001
Wilman (137)	75%	.00004	77%	.00004
Tingha (51)	75%	.02	55%	.4
Oodnadatta (62)	75%	.04	74%	.04
Gayardilt (108)	73%	.002	65%	.03
Expanded Oodnadatta (209)	70%	.0004	67%	.0009
Nyungar (337)	65%	.0002	67%	.00005
Akwe-Shavante (149)	92%	.00000000000002	60%	.05
Garo (63)	69%	.05	100%	.0000001
Gangadikara Vokkaligas (117)	81%	.0002	56%	.3
Yanomamo (157)	73%	.00004	47%	.8
Saint Gabriel (184)	54%	.3	64%	.03
Tory Island (100)	60%	.1	52%	.4
Wampar (228)	55%	.2	58%	.03
Anuta (152)	54%	.2	54%	.2
Badu Island (313)	53%	.2	52%	.3
Uladen Tuareg (280)	51%	.4	47%	.8

Data for Groote Eylandt compiled from Rose (1960) and Worsley (1952/1953) courtesy of D.R. White and the Institute for Aboriginal and Torres Strait Islander Studies, for Alyawarre from Denham (1976) and courtesy of the Institute for Aboriginal and Torres Strait Islander Studies, for Andymathanha from McKenzie and Davis (1973), for Wilcannia (News South Wales) from Memmott (1991), for Wilman from Tilbrook (1983), for Tingha (New South Wales) from Fennell and Grey (1974), for Oodnadatta from Gibson (1987), for the Gayardilt of Bentdinct Island from Tindale (1962) for Expanded Oodnadatta courtesy of M. Moisseeff, for Nyungar from Tilbrook (1983), for Akwe-Shavante from Maybury-Lewis (1967), for Garo from Nakane (1967), for Gangadikara Vokkaligas from Banerjee (1966), for Yanomamo from Chagnon (1974) courtesy of D.R. White, for Tory Island from Fox (1978), for Saint Gabriel from Gagné (1985) courtesy of D.R. White, for Anuta from Feinberg (1981) courtesy of D.R. White, for Uladen Tuareg from Guignard (1984), for Torres Strait from Rivers (1904), and for Wampar from Fischer (1975) courtesy of A. Schultze.

In order to properly appreciate these figures it is necessary to understand exactly what is being measured: sidedness rates are assessed not in terms of marriages per se, but in terms of the circuits these marriage compose. Consider a hypothetical marriage network core containing five patrilines (or matrilines). These patrilines are joined to each other by a minimum of five marriages, each patriline being linked to the others by a minimum of two affinal ties. Indeed, if these five patrilines were joined by any less than five marriages, the path connecting them together would not be closed and no circuit would be formed. Thus, a first circuit is established when the number of marriages linking the patrilines included in the core (five) is equal to the number of patrilines themselves (five). Every additional affinal tie thereafter establishes a further circuit. For example, a core composed of five patrilines connected to each other by, say, ten marriages, would contain a first circuit founded upon the first five marriages

plus an additional circuit for each additional marriage, that is, six circuits in all. The formula for evaluating the number of 'independent' or 'elementary' circuits within any marriage network core is a generalisation of this relationship: N° circuits = N° marriages - N° unilineal groups + 1.[7] Now, in order to assess the sidedness of a marriage network core, we need to examine whether the independent circuits linking the unilineal groups it contains close at an even or an odd number of affinal ties. Those circuits that close at an even number of affinal connections are consistent with a bipartite distribution of these groups, that is, with sidedness, whereas those that close at an odd number are not. For each independent circuit in the core, the probability of its closing at an even number of affinal ties by chance alone is .5 or one-half. In other words, in a situation where marriage ties between the unilineal groups are distributed in a purely random fashion, we should expect to find 50% sidedness. The rates of sidedness indicated in Table 1 are to be understood in terms of a departure from this expected 50:50 ratio.

All else being equal, a given sidedness rate for a marriage network core containing a large number of circuits is more significant than the same rate for a core with a smaller number of circuits. However, core size is not the only variable that needs to be taken into consideration. As the number of connecting marriages in the core rises above the number of unilineal groups these marriages connect, affinal circuits become increasingly interlocked. As a result, there is an ever greater likelihood that inconsistencies with sidedness will arise. Thus, a certain rate of sidedness occurring in a dense core is more significant than the same rate occurring in a more weakly interconnected one. Statistical evaluation of this variability can be determined by the binomial significance test, where the value 'p' in Table 1 indicates the probability that a given rate of sidedness has occurred by chance alone.[8] For example, 78% of marriages (independent affinal circuits) in Wilcannia are viri-sided instead of the expected 50%. The likelihood of this distribution occurring by chance is less than 1 in 1000 ($p<.001$); it is therefore significant. The uxori-sidedness rate of the Wilman marriage network is almost identical (77%); however, this finding is two orders of magnitude more significant than the Wilcannia result ($p<.00004$): a larger core, composed of a greater proportion of interlocking circuits is involved.

The highest rates of sidedness are found among the Groote Eylandt Winindiljangwa (100% viri-sided), the Alyawarre (98% viri-sided and 95% uxori-sided) and the Adnyamathanha (92% uxori-sided), the lowest among the Nyungar (67% uxori-sided). If only those cases in which moieties and/or section systems are absent are considered (Wilcannia, Wilman, Tingha, Oodnadatta, Gayardilt, Expanded Oodnadatta and Nyungar), the average rate of sidedness is 74%, the likelihood of this result occurring by chance being fairly low (average $p<.009$). If only the most inclusive of these cores are retained, that is, if the Wilman and Oodnadata networks, respectively encompassed by the Nyungar and Expanded Oodnadata networks, are not counted, the outcome is very much the same: an average sidedness rate of 73% (average $p<.005$). These findings are comparable to those observed for other sided populations lacking moiety divisions and contrast with the results for those populations among whom sidedness is absent. Among the latter, with an average sidedness of 57% (average $p<.2$), the highest rate for sidedness is found in Saint Gabriel with 64% uxori-sidedness. This figure is similar to that found for the Nyungar, whose 67% uxori-sidedness rate is the lowest among our sample Australian Aboriginal populations; however, whereas the probability of 64% sidedness occurring

by chance in Saint Gabriel is 3 in 100, the probability of 67% sidedness occurring by chance among the Nyungar is 5 in 100,000.

Figure 8
Alyawarre viri-sidedness

Figure 9
Adnyamathanha uxori-sidedness

Figure 10
Wilcannia viri-sidedness

Figure 11
Wilman uxori-sidedness

The particular characteristics of sidedness among this or that Australian Aboriginal population are conditioned by considerations pertaining to group membership, residence, inheritance, et cetera. It is such factors, as well as others such as the frequency of oblique marriages for example, which may account for the fact that in some cases sidedness seems to be skewed in favour of either the male or female line, while in others, rates of viri-sidedness and uxori-sidedness are about the same.[9] However, sidedness itself can not be accounted for in these terms. Indeed, as has been shown elsewhere (Houseman and White 1997; White and Houseman n.d.), the sidedness pattern may operate independently of any particular descent, residence or inheritance rule. In short, it is an alliance structure that does not imply any special type of distribution of individuals into socially identified units.

Sidedness, then, is not a transmittable property of individuals. Nor, however, is it to be confused with comprehensive classificatory systems of the moiety or section/sub-section variety. On the one hand, sidedness can obviously be positively related to such systems. Thus, there is a clear difference, both in Australia and elsewhere, between those cases of sidedness where these type of arrangements are recognised -- Groote Eylandt, Alyawarre, Adnyamathanha, Garo and Akwe-Shavante -- and those in which they are not. On the other hand, the presence of this same sex-linked bipartite pattern, albeit in a less systematic form, among groups having neither moieties nor sections/sub-sections, implies that the relationship between sidedness and such organisational features is neither a necessary nor an unproblematic one.[10] In this regard, it is to be recalled that what are at times called 'moieties' in Aboriginal societies very often have no proper names, and in certain cases are identified by reciprocal expressions alone.[11] Scheffler has argued that such bipartitions are best viewed not as distinct entities but as 'aggregates of like kinship relationships' (1985, 177, citing Meggit 1972) 'based on, and structurally derived from, the system of kin classification' (ibidem; see also Scheffler 1978). However, the existence of sidedness among both 'remote' and 'settled' Aboriginal populations, irrespective of the kinship terminology in use, suggests a further perspective in which systems of kin classification themselves may be seen as depending in part upon a dual organisation of marriage behaviour.

The difference between sidedness and moiety organisation becomes clearer when one considers the essentially statistical nature of sidedness. As Table 1 shows, sidedness is an approximate rather than inherent ordering, invariably involving any number of inconsistencies. Thus, the distribution of descent lines on one side or the other of the matrimonial partition varies according to the point of view adopted, that

is, according to which particular descent line is taken as an initial reference.[12] In other words, the bipartitioning of descent lines can not be determined a priori as it can in the case of moieties. Moiety assignment is in principle an absolute bipartition of individuals (regardless of whether or not they are married or of whether or not their marriages compose closed circuits). Sidedness is relative bipartition of marriage relationships (and pertains only to those marriages that do compose circuits). Unlike moiety organisation, sidedness is a context dependant, local alliance structure. It does not derive from the repeated application of a synchronic marriage (or descent) rule. Rather, it is an emergent feature of the matrimonial network, a regularity arising from the co-ordinate aggregation of actual marriage ties. It is continually generated from the ground up as it were, by situations of everyday interaction in which a tendency towards the diametrical ordering of in-law relationships is a regular feature.

In this light, it is worth stressing that a cumulative behavioural effect such as a propensity towards sidedness does not require linguistic expression as such. Rather, as Bloch (1995) has recently argued with respect to the dual organisation of the marriage network in Zafmaniry villages (Madagascar), such a pattern may be one of those things that 'goes without saying', transmitted through practice as an underlying precondition for conscious action. Indeed, sidedness is best understood as an overdetermined characteristic of the societies in which it is found, deriving from the convergent influence of a variety of factors, any one of which may be sufficient to account for such a pattern. According to this view, political rivalries, processes of socialisation, various classificatory schemes and terminological systems, instances of parallel transmission, ceremonial dualism, relative affiliation, et cetera, may all provide material, relational and conceptual constraints whose cumulative effect, when translated into action, works towards sidedness. Reciprocally, an inclination of the evolving field of kinship and affinal ties in the direction of a sex-linked bipartition tends to prompt the reiteration of side-consistent classificatory and normative phenomena. In this sense, sidedness, once in place, may be self-reinforcing, persisting for example despite considerable changes in descent reckoning, residence patterns, terminological systems and so forth.

There is no rule requiring individuals born of a union in a sided marriage network to contract side-consistent marriages themselves. Nor even is there any obligation that they marry someone with whom they have some sort of prior consanguinal or affinal tie. Indeed, quite a few people included in these networks do no such thing. However, if someone does marry a person with whom a previous connection exists -- there may be good demographic, political and other reasons for doing so -- then the landscape of relationships within which this selection is made is strongly biased in favour of sidedness. In other words, sidedness is not a principle of action but rather a context of interaction. It is a relational condition that governs the ways in which particular marriage choices fit into the ordered development of the marriage network as a whole. In this light, the wider significance of marriage lies not only in the fact that it results in offspring, but also in the way in which it relinks with other (previous and subsequent) marriages so as to inflect the evolving social field with a centripetal curve and to endow this field with overall form. The volontaristic aspect of any particular marriage remains intact; it is nonetheless subordinated to a higher-order structural stability pertaining to the ongoing aggregation of relationships between marriages.

It is the very marriages which compose the marriage network (core) which assure a direct continuity between the state of the network at different points in time:

preceding matrimonial arrangements have a cumulative constraining effect upon the orientation of marriages to come. However, the influence of prior dispositions of the network upon its later development, because it is mediated by particular initiatives informed by strategic and other factors, is not a mechanical one. Evolving demographic, ecological or political conditions, changes in the mean age of marriage or in the incidence of plural unions, et cetera, may act to progressively alter the ordering of the network itself. Indeed, because the organisation of a marriage network derives from the historically grounded co-ordination of real marriage connectivities, it is perfectly possible for it to expand or contract from one period to the next, or to become more sided or less so, or to shift, say, from a viri-sided system to an uxori-sided one, et cetera. Such variability is inherent to sidedness itself, an emergent form whose continuity is founded upon an systemic integration of successive modifications rather than upon the simple iteration of some initial pattern.

There is evidence that Australian Aboriginal matrimonial clusters -- a number of them at any rate -- have certain organisational characteristics in common. At the very least, they are oriented towards some type of dual organisation; specifically, they tend to be sexually 'sided'. At this very basic level, as contrasted with European networks for example (those of non-Aboriginal Australians have yet to be documented), Aboriginal marriage networks seem to be everywhere very much the same.[13] This may come as somewhat of a surprise, for it is commonly held that following widespread slaughter, forced displacement and the removal of their children, a fair proportion of Aboriginal people, specifically those living in urban areas and country towns ('settled' versus 'remote' communities), have 'lost' their culture. The findings outlined here suggest that in at least one important respect, this is mistaken. Through participating in their respective matrimonial communities, such persons continue to pass on, generation after generation, that which lies at the base of any distinctive socio-cultural form: a particular system of relationships.

What is a matrimonial community?

Perhaps the most widely agreed upon characteristic of a 'community' is that it constitutes an entirety. As Redfield (1965) has put it, a community forms 'a human whole'. In many cases, this wholeness has an immediacy that can be related to residence or locality, such that one readily speaks of a village or local community. Alternatively, an idea of common, possibly genealogical origin is entailed, in which case a lineage, tribal or ethnic community may be involved. Further criteria may be evoked as well: shared language, economic interdependence, et cetera. In putting forward the idea of a matrimonial community, I am referring to a social entity whose wholeness derives from the systematic intermeshing of marriage ties.

The marriage network core provides a rigorous basis for the delimitation of a such an entity. As it stands, however, the core is overly restrictive. This is because the individuals it incorporates do not exist on their own, but as members of a set of persons between whom marriage is in principle excluded by virtue of relations of shared identity. It is these groups of non-intermarrying individuals -- families, lineages and so forth -- that define the inner limits of the matrimonial universe of their respective members. I suggest that in much the same way, the outer limits of this matrimonial universe may be defined by the sum of such groups. Together they delineate a particular relational field composed of actual and potential affines: persons who are neither 'too close' nor 'too far' and therefore eminently marriageable.

According to this view, a matrimonial community may be defined as that set of exogamous collectivities whose members participate in the core marriages of a marriage network.

This is a formal definition. The nature and the extension of the exogamous collectivities in question will vary from one society to the next and must therefore be determined locally. Sibling groups, nuclear or extended families, bilateral kindreds, residential units, lineages, clans, et cetera, all represent possibilities. Indeed, it may well be that each concrete case will incorporate a number of variables. Among the Beti of Cameroon for example, the collectivity of unmarriagable individuals corresponds above all to the patriclan, but also includes all those persons between whom a cognatic connection can be precisely accounted for (Houseman 1990). Among populations whose kinship terminologies entail a 'bifurcate merging' or 'crossedness' principle (Dravidian, Iroquois, Crow-Omaha types), 'parallel' kin will be included, while certain 'cross' kin will not be.[14] Among most European populations, exogamy is reckoned mainly in terms of degrees of cognatic relationship; however, the exact number of degrees retained is variable over time and place. Among Australian Aboriginal populations, such a cognatic reckoning may be further tempered by considerations relating to terminological crossedness and/or territorial affiliation. In all cases, contextual factors need to be taken into account and, in general, as in the delimitation of a clustered marriage network, pragmatic and theoretical concerns come into play. However, regardless of the critera adopted, the resulting matrimonial community will be both larger than the core of the marriage network, and significantly different from the original delimited marriage network from which this core derives.

Indeed, the matrimonial community, as envisaged here, entails a still further re-centering of the analytic eye. The nodes or substantive elements that compose it are not individuals joined by consanguinial or affinal ties, as in the case of a delimited marriage network. Nor are they marriages relinked through such individuals into circuits as in the case of the marriage network core. Rather, they are sets of unmarriagable individuals connected to each other through these affinal circuits. A matrimonial community is made up of groups of persons who are united by ties of non-marriagability.

For a given marriage network core, several different matrimonial communities can be envisaged, depending upon the critera used for the determination of the exogamous groups involved. This is one of the things that makes the actual circumscription of any particular matrimonial community a fairly complex affair.[15] However, over and above such local, substantive considerations, there is a general, formal issue distinction which must be made. The exogamous groups at least <u>one</u> member of which participates in a core marriage make up a fairly loose, diffuse sort of matrimonial community. A tighter, structurally more coherent matrimonial community, one which we may call a <u>connubium</u>[16], is composed of those sets of non-intermarrying individuals having at least <u>two</u> members involved in core marriages. In this case, the relationship between exogamous collectivities is similar to that obtaining between core marriages: each one is linked to every other one in at least two different ways. In other words, they are integrated into closed circuits, such that a given group's connections with others are a constitutive aspect of the connections the latter have among themselves. Such multiply linked groups are structurally committed to the matrimonial community of which they form a part in a way that those connected by a single link are not. Moreover, this type of commitment correlates with a heightened involvement on a psychological and sociological level as well. Thus, these more

constraining conditions of relationship provide the grounds for a more or less systematic imbrication of expectations and concerns. They make for both a closer knitting of interactions and a richer circulation of information among the persons involved. This entails a potential for intensification and hence a degree of social engagement that a single marriage link alone does not allow for. Brudner and White (1997, 9-10), speaking of the marriage network core of a modern-day Austrian village, make a similar point: 'Every family story, every piece of gossip or information, can be received and cross-checked through [at least] two different connecting paths of transmission. This ability to independently corroborate intimate "family" information through independent paths may serve to reinforce other relations in the network, as for example, trust or enmity, and in-group or out-group membership norms'.

A few cautionary remarks regarding the nature of matrimonial communities are perhaps in order. First, a connubium coincides only approximately with what may be recognised (by analysts or by the actors themselves) as a 'society'. The latter often includes persons who occupy important social roles with respect to each other in the absence of mediating affinal ties. The Indian caste system provides a particularly flagrant example of this; Australian Aboriginal instances include certain neighbouring groups, various work-place relations, non-Aboriginal store-keepers, administrators, researchers, et cetera. Furthermore, as I have repeatedly stressed, a matrimonial community is not a static configuration but a historically constituted one; like the marriage network core on which it is based, it is constantly evolving, its precise contours changing over time. This means that at any given moment, there may be any number of persons between whom regular social intercourse takes place but whose respective families have yet to be relinked through marriage. This having been said, however, among Aboriginal Australians, whose 'thoroughgoing kinship polity' (Fortes 1969, 102) is well-known, the matrimonial community remains a particularly essential aspect of people's lives.[17] Thus, in the same way that structural commitment to the same connubium implies a close sharing of expectations and concerns, inversely, peoples' ongoing involvement with each other, if it has enduring value, tends to lead to affinal relinking (see Koepping 1977 for a contemporary example). In general, it is no exaggeration to say that for most if not all Australian Aboriginal populations, the web of kinship and marriage connections entailed by their matrimonial communities provides the immediate armature for the vast majority of social interactions in which they engaged.

Second, the relationship between matrimonial communities and 'tribal' or territorial identities is not a simple one. On the one hand, given past and present rates of inter-tribal marriage, it may often be inappropriate to limit the marriage network to those marriages in which at least one partner lays claim to a particular tribal affiliation. Where it is does seem appropriate to do so, the resulting matrimonial community usually includes but a segment of those persons capable of making such a claim. On the other hand, while a connubium may be centred around some sort of territorial reference, the system of affinal relinkings that unites the exogamous groups involved typically reaches beyond the boundaries of the local group. For example, the data used to establish the marriage network core of the New South Wales town of Wilcannia provided in figure 10, while incorporating persons claiming a number of different tribal affiliations, concerns only (past and present) town residents. A more accurate representation of these persons' connubium would be one that extends beyond Wilcannia to encompass a number of localities (Beckett 1991; see also Birdsall (1991) on Nyungar 'runs' and 'lines' as well as MacDonald (1987) on the distribution of

marriages for a contemporary Wiradjuri community of New South Wales). The largely Aboriginal town of Oodnadatta in South Australia provides a similar example. Consider figure 12a, where males are indicated by solid lines and females by dotted lines. It represents the core of a marriage network connecting the various families reported by Gibson (1983) as living or having lived in or around this town. However, this core has been limited to only those circuits composed of marriages of the persons belonging to these families. Now compare this with Figure 12b which also represents the core of a marriage network relinking these same families. In this case the core has been augmented by other circuits which, in order to relink the marriages of Oodnadatta residents to each other, reach beyond the confines of the town to include non-residents and persons from a wider range of tribal affiliations. The latter data derives from Marika Moisseeff's field notes from her work among the Aboriginal population in and around the South Australian town of Port Augusta in 1993-94 (see Moisseeff 1997); it is not exhaustive and is meant to be suggestive rather than rigorously demonstrative. All the same, the difference between these two cores is striking: the one contains 62 unions, the other 209. The connubium derived from the latter not only encompasses a higher proportion of Oodnadatta families, it also accounts for many more of the genealogical interconnections that unite them, along with a number of non-resident others, into a particular socio-cultural whole.

Figure12a
Oodnadatta, core

Figure 12b
Expanded Oodnadatta, core

Finally, unlike the marriage network cores from which they derive, matrimonial communities are not discrete entities. Any particular set of non-intermarrying persons may be structurally committed to two or more matrimonial communities. For example, a fair number of the people in the connubium founded upon the Oodnadatta cores represented in figures 9a and 9b, are also closely linked to other matrimonial communities centred elsewhere: around Lake Eyre, in the Flinder's Ranges and so forth. However, participation in a plurality of partially overlapping matrimonial communities, possibly situated at varying levels of organisation (see supra), is not particularly problematic for the persons concerned. Each family sees itself not as an element of a closed circle of marriages, but at the centre of a complex web of affinal connections. Indeed, from the point of view of the participants, 'membership' in a connubium is more a matter of more-or-less than one of yes-or-no. In this respect, structural commitment to a particular matrimonial community is perhaps best understood as a potentiality. It is the formal, relational foundation for and expression of a systemic involvement with the other 'members' of that community. However, the actual intensity of this involvement and the particular forms it takes will vary from case to case as a function of circumstantial considerations and individual life histories.

Conclusion

The study of Australian Aboriginal kinship and marriage has remained largely dominated by a preoccupation with terminological categories and the logical entailments of 'positive' marriage rules. It is thus become increasingly difficult to

bridge the gap that has grown between 'kinship' studies among remote Aboriginal groups where moieties, section/sub-section systems, prescriptive terminologies, et cetera are present, and research on 'family' organisation among settled Aboriginal populations where such organisational features are lacking. By giving primary importance to the properties of empirical marriage networks as they unfold through time, I have argued for a reversal of this trend. By attending to the emergent patterning of kinship and marriage connectivities, I suggest, it becomes possible to envisage certain aspects of Aboriginal social organisation in a novel comparative perspective capable of transcending remote/settled, 'elementary'/'complex' distinctions. I do not wish to imply that the study of systems of kin classification and related marriages rules are unimportant. The approch sketched out here, in many ways but a systematic application of a direction of research already pursued by a number of authors (for example Rose 1960; Hiatt 1965; Myers 1986), is to be seen as complementary to rather than exclusive of such concerns. For example, it is necessary to consider not only the incidence of terminology and marriage regulations upon the patterning of actual kinship and marriage ties (see for example Keen 1982), but also and inversely, how the formal properties of the kinship and marriage network as a whole may contribute to the development of certain terminological or normative phenomena. Similarly, I am of course not proposing that differences between remote and settled Aboriginal populations do not exist, but that such differences need to be evaluated in the light of empirical behaviour on the level of the ongoing ordering of their respective matrimonial networks. In this respect, the predominance of dual organisation among both settled and remote Aboriginal groups, as shown above, is, at the very least, highly suggestive of a unity of structure which transcends disparate historical circumstances.

In attempting to propose a coherent analytical framework for the study of empirical marriage networks, I have distinguished between:

1. The delimited marriage network, assembled from a plurality of points of view and extracted from the larger regional, national or global. marriage network in which it is embedded in accordance with certain pragmatic and theoretical concerns.
2. The core of this network, composed of the genealogical circuits of relinked marriages (and the bridges these circuits, see note 4 supra) within such a network.
3. The matrimonial community, comprised of locally defined sets of non-intermarrying individuals connected to each other through core marriages; a special case of which is
4. the connubium, those locally defined sets of non-intermarrying individuals connected by multiple core marriages.

These various entities form a ordered series. At the same time, they concern quite different levels of analysis. Respectively they represent:

1. an open network of individuals connected by ties of consanguinity and affinity;
2. a closed network of marriages relinked through individuals into circuits;
3. an open, or
4. closed network of affinally related exogamous groups.[18]

The analytical framework implied by these notions is at once rigorous and flexible. Various criteria may be used both to delimit marriage networks and to determine the non-intermarrying sets of individuals which make up matrimonial communities. Different sorts of marriage network cores may be envisaged as well. The sample network cores considered above are all instances of the widest possible type of core, namely that formed by the sum of all genealogical circuits within the marriage network. However, more restricted cores such as those composed of only those

circuits incorporating less (more) than a certain number of affinal (H/W) ties, or of only those circuits spanning more (less) than a certain number of generations, or of only those circuits made up of sibling-in-law ties, and so on, may also be taken into account. In this way, a variety of alternative network entities and their sociological correlates may be explored.

Ethnographic accounts overwhelmingly attest to the central mediating role played by affinal connections among Australian Aboriginal populations. People having inter-related ties to the same stretch of territory, those undertaking ceremonial activities together, et cetera., do not just happen to intermarry. Rather, ongoing relations of matrimonial interdependence between such persons' families are constitutive of their ability to perform certain rituals, to properly look after country, to faithfully transmit land-related knowledge and so forth. One of the characteristic features of Australian Aboriginal societies is the at once intimate and systemic quality of the connection between links with place on the one hand and ties between people on the other. Indeed, this is one of the things that renders Aboriginal attachments to land so irreducible to individual possession, and hence, distinctively indigenous. To the extent that networks of kinship and marriage ties provide the basic social armature upon which this complex interrelationship is built and through which it is passed on, one possible practical domain of application of the perspective outlined here is that of land claims, notably Native Title claims, a major current preoccupation of many Aboriginal groups (see for example Edmunds 1994; Fingleton and Finlayson 1995). It is difficult to evaluate, in abstract terms, the usefulness of identifying delimited marriage networks, the cores of such networks, the matrimonial communities which derive from such cores, et cetera, within the context of the land claim process. Where the transmission of customary-law land entitlements along lines of descent is clearly at work, fairly well-defined estates being held by families or other small groups, such an approach may prove irrelevant, redundant, or even, as an source of unwarranted conflict, highly problematic. However, wherever, for either historical or social structural reasons, descent-based lines of transmission are less in evidence and/or a more holistic approach seems appropriate, marriage network entities may provide the empirical grounds for the conceptualisation and the constitution of more extensive collectivities in whose name land claims may be pursued.

NOTES

1. The presence of 'inter-tribal' marriages and in recent years, forced reallocations and the removal of 'half-caste' children as well as an increase in geographical mobility, may all be supposed to have contributed to a dispersal of alliances. On the other hand, the more or less systematic concentration of the remnants of decimated populations around government settlements and in missions may have had an opposite effect, bringing about for example a higher rate of local endogamy than existed previously. Such matters can only be settled empirically.

2. This formalism derives from Bertin (1967) and Guilbaud (1970). See White and Jorion (1992) for a discussion and Héran (1996) for a comparable system of notation.

3. This and the following figures derive from the IBM PC program PGRAPH, written by Douglas R. White to produce graphic representations of kinship networks as parental orders (see White and Jorion 1992; White and Houseman n.d.). It should be noted that the generations shown in these graphs are the result of an algorithm which locates parents' marriages at a higher generation than those of their children. In other words, these generations correspond neither to genealogical levels nor to chronological intervals but derive from the organisation of the network as an entirety.

4. The core may include marriages which are not themselves part of a block (they do not lie upon a circuit), but which connect various blocks or sub-cores together. However, in those cases where the core is composed of a single block, as in all the marriage networks mentioned in this article, the terms 'core' and 'block' may be used interchangeably. For more regarding this and other aspects of core structure, see White and Jorion (1996); White and Houseman (n.d.).

5. A similar example from the Indian sub-continent is that of the Purum: the sample of 141 marriages collected by Das (1945) which has occasioned the spilling of so much anthropological ink (for example Needham 1962, 1971; Akerman 1964), in fact reduces to a core of only 18 marriages.

6. The expression 'super-set' is used here to indicate that the possibility of representing the marriage network by means of a bipartite graph (see Hage and Harary 1991) does not, in itself, imply the existence of such bipartitions as culturally recognised units.

7. In a core containing G groups connected by M marriages, it is possible to trace out more than M-G+1 circuits. However such surplus circuits, formed by the union of two or more 'independent' or 'elementary' circuits, are analytically superfluous. Core structure can only be legitimately evaluated with regard to elementary circuits, that is, those that can not be formed by the union of two or more circuits in the core. The graph theory formula for calculating the number of elementary circuits in a graph is N° arcs - N° nodes + 1 (Gibbon 1985).

8. See for example Mendenhall and Ramey (1973) for the binomial test; for the application of this test to the measurement of bipartite marriage network patterns, see White and Jorion (1996).

9. Oblique marriages, that is, marriages between persons of adjacent generations, can be distinguished formally by the fact that, unlike same generation marriages, they are not compatible with both viri- and uxori-sidedness, but only with either one or the other. Thus, marriages with ZD, BDD or WBD (or with FFZD, MBSD or MBW) are consistent with viri-sidedness but not with uxori-sidedness, whereas marriages with FZ, BD or MBDD (or with MMBD, MMBDDD or FZDD) are consistent with uxori-sidedness but not with viri-sidedness. This means that in marriage networks where there are no oblique marriages, viri-sidedness implies uxori-sidedness and vice versa:

the marriage network is at once viri- and uxori-sided. Similarly, the presence of both viri- and uxori-sidedness implies the absence of such marriages. Regarding these matters see Houseman and White (1997).

10. The Adnyamathanha case provides an interesting historical example of how moiety membership and sidedness, once closely congruent, can become disconnected. C. Davis and P. McKenzie, the authors of Adnyamathanha Genealogy (1985), explain 'We have not included the [matri]moieties in this book because a lot of Adnyamathanha men either had mixed marriages or relationships with women from different tribes with different systems of descent' (1985, vii). This is consistent with the widely held opinion among those included in these genealogies that the prohibition on intra-moiety unions has long since ceased to be in effect. Nevertheless, as Figure 9 and Table 1 attest, there are only six exceptions to uxori-sidedness, the likeliness of such a distribution occurring by chance being 2 in 10,000,000,000,000,000.

11. See for example Scheffler's (1985) reconsideration of Meggitt's (1962) Warlpiri material and Moisseeff's (1995) synthesis of Spencer and Gillen's (1927) observations regarding the Aranda.

12. Take for example the simplest case of descent line A, linked by marriage with lines B and C which have a marriage link between themselves. From A's viewpoint (that is, taking descent line A as an initial reference), B and C are on the same, opposite side, whereas from, say, B's point of view, both A and C are together on the opposite side from B. The sidedness rates provided above for various populations represent 'best fit' bipartitions for the networks concerned, but by no means the only ones.

13. I have sought to illustrate certain broad features of Australian Aboriginal marriage networks. A closer analysis, impossible within the limits of this paper, would of course reveal further common characteristics as well as more fine-grained morphological differences from one population to the next, regarding for example varying rates of particular types of marriages.

14. It is important to stress that the distinctive criteria here is non-marriagability and not the absence of kinship per se. Thus, for example, in a society where mother's brother's daughter (MBD) is a permited spouse and father's brother's daughter (FZD) is not, both may be recognised as Ego's kin; however MBD, is a (virtual) affine and does not count among Ego's consanguines. Regarding the importance of not conflating consanguinity with kinship, see Viveiros de Castro 1997.

15. It is also necessary to be sensitive to the difference between general classificatory principles of exogamy (for example clan or moiety co-membership) and operational relations of non-marriagability as defined by the application of these principles in particular social contexts. For example, it does not seem very helpful to include as part of the same matrimonial community, clan or moiety members residing in distant areas between whom no regular relations exist.

16. The term 'circulating connubium' was introduced by Dutch anthropologists to describe an asymmetrical alliance system of Indonesia founded upon circuits of wife-giving and wife-taking groups (van Wouden 1968). For this reason the word 'connubium' alone easily lends itself to the idea of a set of collectivities systematically interconnected (albeit not necessarily asymmetrically) through marriage.

17. 'We can take it as established that the ideology of kinship pervades, regulates and orders every domain of Australian Aboriginal social life. Even the partly esoteric domain of totemic belief, cult and mythology is tied to the framework of kinship' (Fortes 1969, 102). Regarding the importance of relations of kinship and marriage

among Australian Aboriginal populations in an urban setting, see Inglis (1964), Gale (1970) and Schwab (1991) among others.

18. This list does not exhaust the components of a network framework for the analysis of kinship and marriage (see White and Houseman n.d.). Thus, as mentioned in note 4 supra, strictly speaking, a marriage network core is made up either of a single block (a set of interconnected marriage circuits) or of several blocks linked to each other by inter-block points or paths (bridges) which are not themselves part of a block. Such bridges between the component blocks of a core may be founded either upon ties of descent, in which case the persons in the linked blocks may be presumed to have a common ancestor, or upon a relation of affinity, in which case the persons in the linked blocks may have real or potential descendants in common. These two logical possibilities represent two very different situations sociologically. If only ancestor-based linkages are taken into account, those blocks connected through marriage alone being excluded, the result is a descent core. In the context of Aboriginal land claims for example (infra), it may be appropriate to focus upon matrimonial communities and connubia derived from such descent cores.

ACKNOWLEDGEMENTS

An initial version of this paper was presented at the Research Seminar of the Australian Institute for Aboriginal and Torres Strait Islander Studies in October 1994. I am grateful to the Institute and to the participants of this Seminar for their comments and encouragement. I am also indebted to the Anthropology Department of the University of Adelaide, J. Gray and D. Fergie in particular; as a Visiting Research Fellow of the Department my work was greatly facilited. Finally, I would like to thank P. Boyer, K. Doohan, M. Edmunds, L. Hiatt, W. Humes, I. Keen, J. Lambert, G. MacDonald, M. Moisseeff, N. Peterson, P. Sutton, E. Viveiros de Castro, D. R. White and the AAS Journal's anonymous reader who kindly commented on earlier drafts.

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