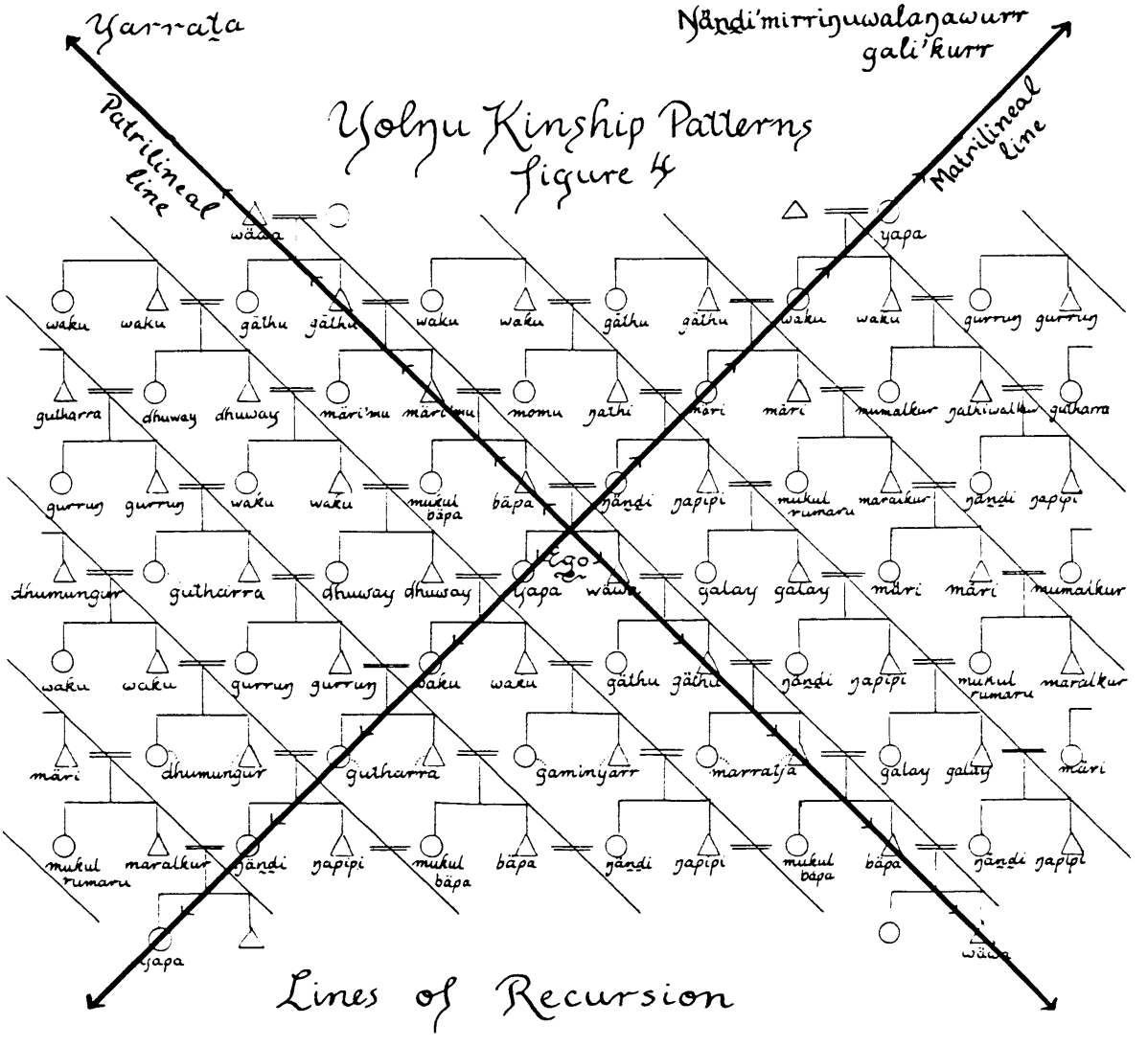
Recursion Patterns

It can be seen in figure (3) that many of the kinship terms appear several times across the diagram. Specifically, from the perspective of ego there are four recursive series. They can be illustrated by the diagonal construction of two straight lines, perpendicular to each other and intersecting at ego. One line passes through ego up through his male direct ancestors (forming one recursive series), and downwards through ego's male direct descendants (forming a second). This line is in termed **yarrata** (literally meaning line) and constitutes the patrilineal line of descent. The second line passes upwards from ego through her direct female ancestors (mother, grandmother etc.) to form a third recursive series, and downwards through ego's direct female descendants

(daughter, daughter's daughter etc) to form the fourth. This is shown in figure (4), where a generation has been added at each end of both lines to expose the recursion.



In the patrilineal line there is a repeating ascending series which re-occurs after four generations (beginning with ego), and a repeating descending series.

In the matrilineal line there are similarly two series which re-occur after four generations, one descending and the other ascending.

Following the male line through ego and adding a generation (named by Yolŋu informants) at either end, the recurring pattern becomes clear:

wäwa
gäthu
märi'mu
bäpa
wäwa
(e g o)
gäthu
marratja
bäpa
wäwa

Similarly the female line through female ego (**ŋändi'mirriŋuwalaŋawurr gali'kurr** - by way of mother's side), with the addition of a generation (named by Yolŋu informants) at either end yields:

yapa
waku
märi
ŋändi
yapa
(e g o)
waku
gutharra
ŋändi
yapa

The female line will subsequently be seen as a source of another aspect of the kinship structure incorporating a series of terms denoting the relationships between the membership of different clans.

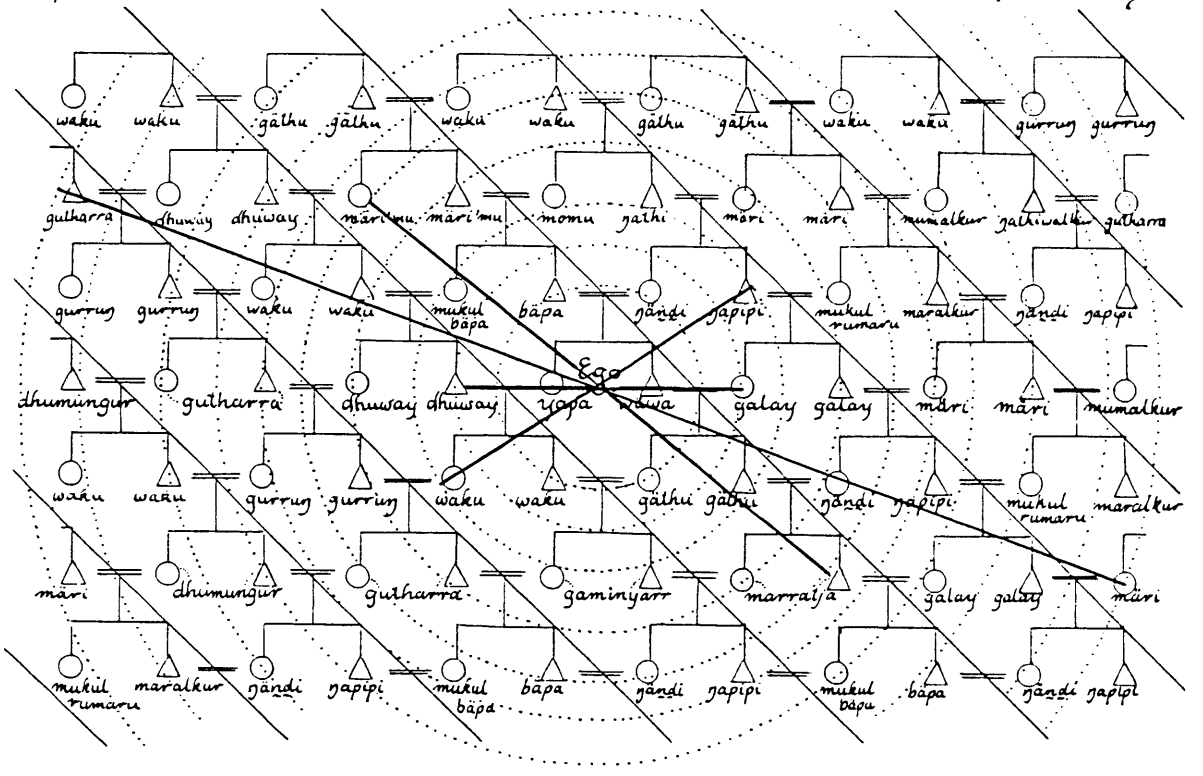
Radial Symmetry

If a series of concentric circles is generated around ego on the diagram, a remarkable pattern can be discerned. When a line is drawn beginning from any of ego's relations on any given circle, and taken through the centre to a point opposite on the same circle, then it meets the individual who is in the opposite (reciprocal) relationship to ego. Putting it another way, individuals who are equidistant from ego and who can be connected by a straight line passing through ego, stand with ego as reciprocal members of the same kinship pair. Thus **ŋapipi** meets **waku**, **galay** meets **dhuway**, **gutharra** meets **märi**, and so on (see figure 5).

This pattern is really a geometrical manifestation of the the principle of reciprocal relationships. That is, for every person to whom ego relates in a given way, there is another who stands with ego in that same way. It is like the symmetry of the positive and negative form of the same number about zero. Thus (+2) and (-2) are equal and opposite in

relation to (0). They are the same distance along the same number-line from (0), but are in opposite positions. (+2) occupies the same position relative to (0) as (0) does to (-2).

Figure 5. Yolŋu Kinship Patterns - Inverse Radial Symmetry



Relating Clans

The Yolŋu kinship system also encompasses the determination of relationships between the individual's clan and other clans (and their languages, lands, ceremonies,and totems). In this way the individuals as a member of his/her own clan knows his/her rights and obligations in relation to the membership, activities and lands of other clans. In this context it is important to note that many Yolŋu clans (**bäpurru**) have named subdivisions (with different sub-group surnames), marked variably by differences in homeland, totem, ceremony or language.

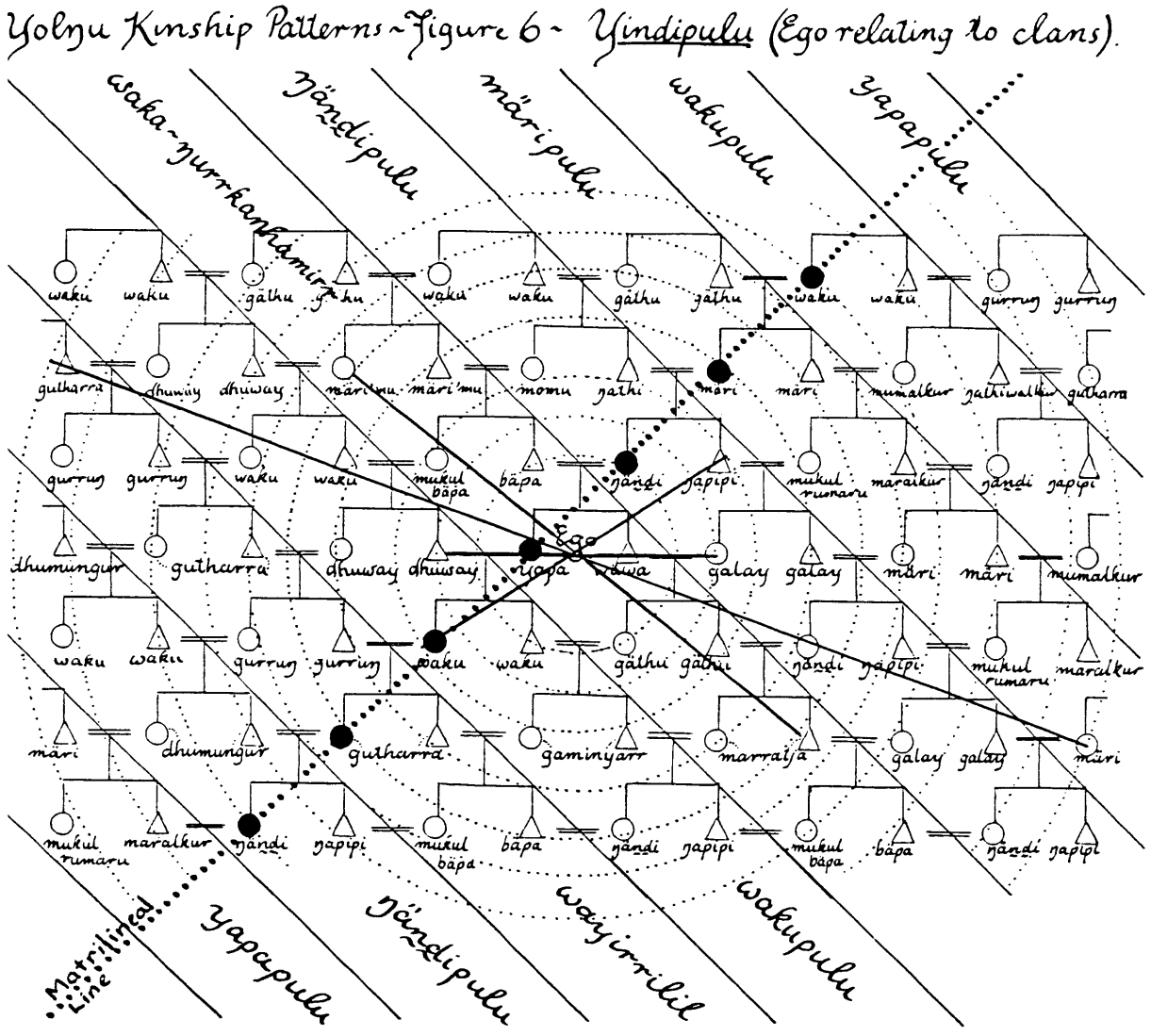
These subgroupings may reflect differences in their creation histories - the rationale is encoded in **manikay** (song cycles). As such the members of different subgroups can stand in variable relationships with another **bäpurru**. Thus for example, **Guyula-Djambarrpuyŋu** and **Ŋurrupuy-Djambarrpuyŋu** are two subdivisions within the **Djambarrpuyŋu** clan and stand in the separate relationship of **yapa** and **gutharra** respectively, to a **Marraŋu** clan member (Wanambi, 1990).

A classificatory term for the membership of one's own clan is **waka-ŋurrkanhamirr**. The other clan-kinship terms are named after the relationship of the woman who both belongs in that clan and is matrilinealy a direct ancestor or descendent of ego (in reality or conceptually, according to the terms of the whole system). Most of the terms are themselves formed by adding the suffix **-pulu** to the appropriate matrilineal term.

yapapulu	(great-great-grandmother's clan)
wakupulu	(great-grandmother's clan)
märipulu	(grandmother's clan)
ŋändipulu	(mother's clan)
waka-ŋurrkanhamirr	(own clan)
wakupulu	(daughter's clan)
wayirrilil	(granddaughter's clan)
ŋändipulu	(great-granddaughter's clan)
yapapulu	(great-great-granddaughter's clan)

These groupings can now be applied to the kinship diagram (figure 6). They correspond with the diagonal sections which delineate relations into moiety and clan. In terms of pattern they follow an alternation with respect to moiety and follow the recursion which is apparent in the matrilineal line through ego. It can be seen that within the diagram there are nine diagonal sections and therefore there is a repetition of clan-kinship terms . However if the clan-kinship terms were to be exemplified by giving ego a specific clan, with the rest of the diagram mapped accordingly, it would be seen that the pairs marked by the same clan-kinship term (**wakupulu** for example appears twice) would be different clans. Thus for the **Marraŋu** person the **ŋändipulu** of the mother's generation is the **Wangurri** clan, whilst the **ŋändipulu** of the grand-granddaughter's generation is the **Warramiri** clan (Wanambi, 1990).

Thus the structure I have outlined in this context of clan interrelationships as shown in figure (6) is sufficient to indicate the matrilinealy determined recursion across the kinship system (again from the perspective of ego), naming ego's relationship with the membership of other clans. However the outline I have given must be recognised as superficial, as my understanding of this area of the system is not sufficient to take the reader very much further.



MÄLK - the subsection system

A further level of complexity in the Yolŋu schema is provided by the system of **mälk** (the subsection system). Before overlaying this system onto the kinship structure diagram it will be removed from its corporate context and analysed in terms of the features it reveals standing alone.

Whilst the whole Yolŋu world is divided into **Dhuwa** and **Yirritja** moieties, the **mälk** system is more closely identified with people. (This is not exclusively so - Yolŋu family dogs have **mälk** identities. There was also the example given earlier of the **Djaŋ'kawu** Creation Sisters being identified by **mälk**.)

There are four pairs of **Dhuwa mälk** (male and female in each pair) and four pairs of **Yirritja mälk**.

Yirritja mälk		**Dhuwa mälk**	
female	male	female	male
buḻanydjan	**buḻany'**	**galiyan**	**burralaŋ'**
ŋarritjan	**ŋarritj**	**bilinydjan**	**balaŋ'**
gutjan	**gutjuk**	**gamanydjan**	**gamarraŋ**
baŋaḏitjan	**baŋaḏi**	**wamuttjan**	**wämut**

Every Yolŋu person is identifiable by a specific **mälk** (subsection) which is determined by (but always different to) the mother's **mälk** according to a formula. When Yolŋu marry according to ideal patterns, the **mälk** of a child is always different from the father. Thus husband and wife belong to different **mälk** pairs (one partner belongs to one of four possible **Dhuwa mälk** and the other to one of four possible **Yirritja mälk**). The children which result are different to both mother and father, but they are the same as each other. (In reality a man might marry two wives of different **mälk** giving a mixture of children, or occasionally a man may marry a woman who by **mälk** relationship, is his "mother" (**ŋändi**). In such cases the father and son could be the same **mälk**).

One way for Yolŋu to establish their relationship with a Yolŋu stranger is to try and identify shared family lines and deduce the relationship accordingly. This is called establishing relationship through **gurruṯu** (family lines). The other way is to identify each other's **mälk** and with the knowledge of how they stand together address each other by the relationship they imply. This is establishing relationship by **mälk**. Sometimes the two methods give different answers either because members of the family have bent the marriage rules, or simply because **mälk** cannot be as specific as **gurruṯu** can, since each permutation yields several possible relationships from which to choose. If they are in conflict then it is the **gurruṯu** relationship which would normally take priority.

Mälk is another criterion by which suitable marriage partners are determined. For each person there is an ideal group of marriage partners (of a specific **mälk**) in the opposite moiety, as well as an acceptable set of second choice partners.

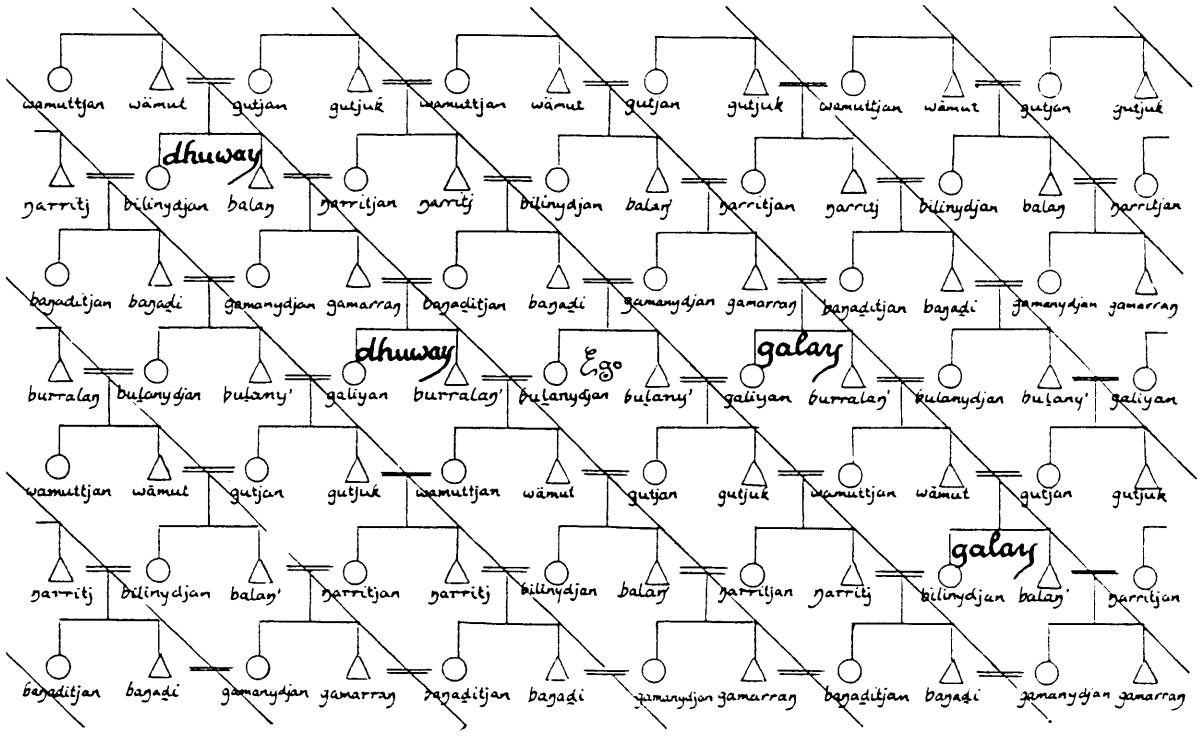
The following table shows how people choose partners and name children according to the criterion of **mälk**:

The Yolŋu Subsection (**Mälk**) System - Marriage Partners and Children.

Husband	Wife		male children	female children
buḻany'	**galiyan**	(1st choice)	**gutjuk**	**gutjan**
	bilinydjan	(2nd)	**baŋaḏi**	**baŋaḏitjan**
gutjuk	**wamuttjan**	(1st)	**ŋarritj**	**ŋarritjan**
	gamanydjan	(2nd)	**buḻany'**	**buḻanydjan**
ŋarritj	**bilinydjan**	(1st)	**baŋaḏi**	**baŋaḏitjan**
	galiyan	(2nd)	**gutjuk**	**gutjan**
baŋaḏi	**gamanydjan**	(1st)	**buḻany'**	**buḻanydjan**
	wamuttjan	(2nd)	**ŋarritj**	**ŋarritjan**
burralaŋ'	**buḻanydjan**	(1st)	**wämut**	**wamuttjan**
	ŋarritjan	(2nd)	**gamarraŋ**	**gamanydjan**
wämut	**gutjan**	(1st)	**balaŋ'**	**bilinydjan**
	baŋaḏitjan	(2nd)	**burralaŋ'**	**galiyan**
balaŋ'	**ŋarritjan**	(1st)	**gamarraŋ**	**gamanydjan**
	buḻanydjan	(2nd)	**baŋaḏi**	**baŋaḏitjan**
gamarraŋ	**baŋaḏitjan**	(1st)	**burralaŋ'**	**galiyan**
	gutjan	(2nd)	**balaŋ'**	**bilinydjan**

By assuming that each man and woman marries the first choice partner and keeping the same conventions as for the other diagrams (one husband for one woman and one wife for one man; two children for each couple etc), a hypothetical model of an idealised family tree can be generated according to **mälk** (figure7). For the sake of example ego will be assumed to be **buḻany'** (male)/ **buḻanydjan** (female). From the diagram it can be seen that each **mälk** pair (brother/sister) alternates with first choice partners (as husband or wife as the case may be) across each generation, and that each **mälk** pair recurs after four generations within each diagonal section (each of these sections represents a patrilineal line as in previous diagrams).

Yolŋu Kinship Patterns - Figure 7 - Arrangement by Mälk



By superimposing onto the diagram the positions of ego's **galay** and **dhuway** as given in previous diagrams (where they both appear twice, two generations apart, in their respective diagonal sections), the logic of the second choice partner becomes clear. **Bulany'** (as ego) finds his first choice partner as **Galiyan** in the position of mother's brother's daughter, and can find a second **galay** relationship two generations down from the first, as **Bilinydjan**. Conversly, **Bulanydjan** (as ego) finds **Burralaŋ'** as her first choice partner (**dhuway**) in the position of father's sister's son, and her second **dhuway** relationship two generations up from the first, as **Balaŋ'**. This pattern reflects the fact that Yolŋu men commonly marry a much younger **galay** (and conversly that women commonly marry a much older **dhuway**).

The same set of rules for determining marriage partners and children according to **mälk** can be schematised more effectively as a series of concentric circles (figure 8) where males and females are assigned to separate, alternate circles. The whole **mälk** series can be arranged around these circles in a pattern consistent with the rules. In figure (8) the number of circles has been limited to five, which is sufficient to locate the appropriate partners for each individual and to identify the **mälk** of each person's children. The whole pattern starts again after moving outwards (or inwards) four circles, and repeats ad-infinitum.

For ego of any given **mälk**, the **mälk** of his/her child of the same sex can be located by moving a quarter of a circle clockwise on the same circle. The **mälk** of the opposite sex child is also located a quarter of a circle clockwise from ego's marked spouse (joined to ego by double lines).

The **mälk** of the second choice partner is located on the opposite side of the same circle as the first choice partner. Following a second choice marriage the **mälk** of male ego's son is located a quarter of a circle anticlockwise from himself, and the **mälk** of his daughter is given a quarter of a circle clockwise from his partner. Female ego marrying a second choice partner finds her daughter's **mälk** a quarter of a circle clockwise from herself, and her son's **mälk** a quarter of a circle anti-clockwise from her second choice spouse.

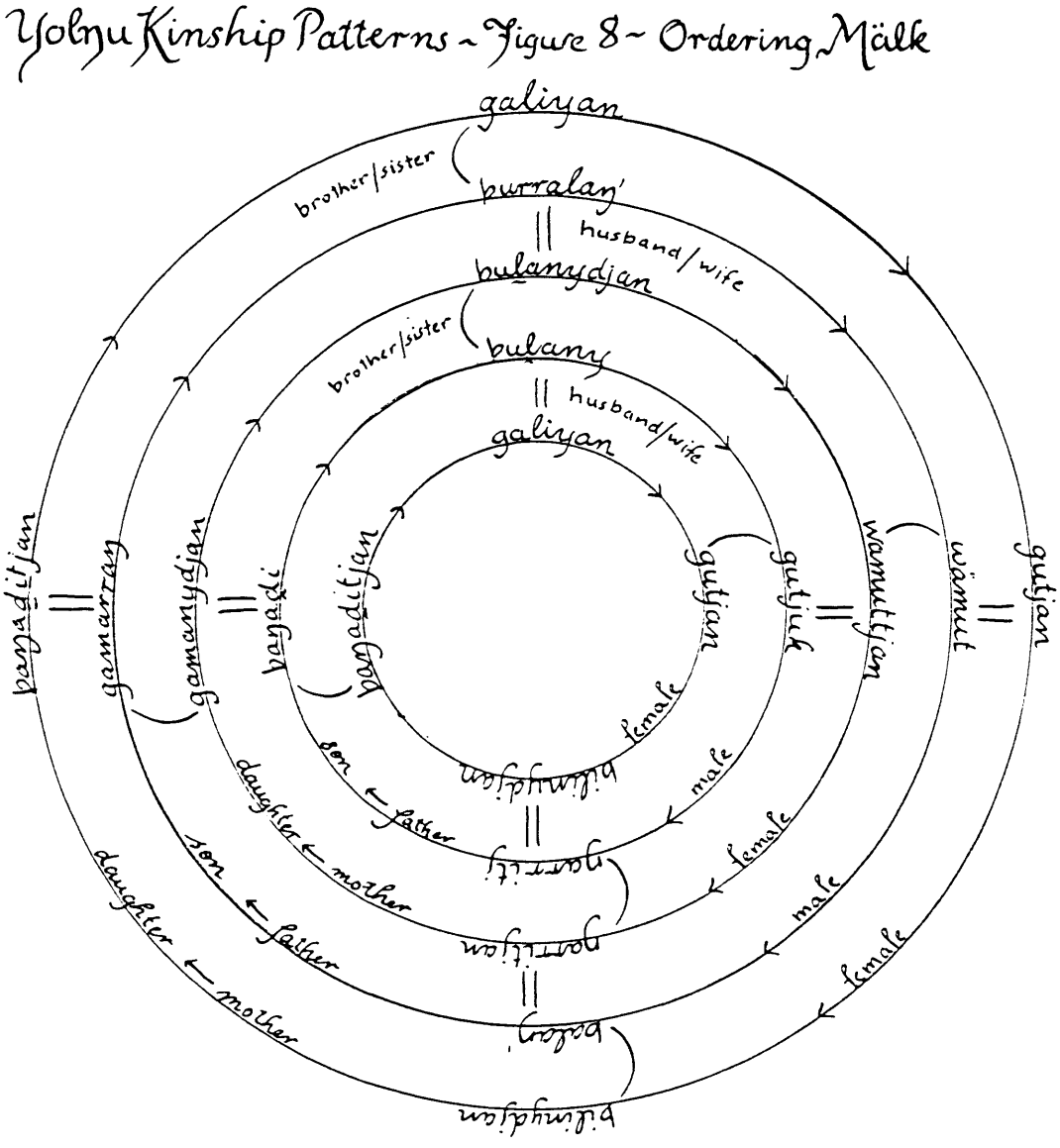
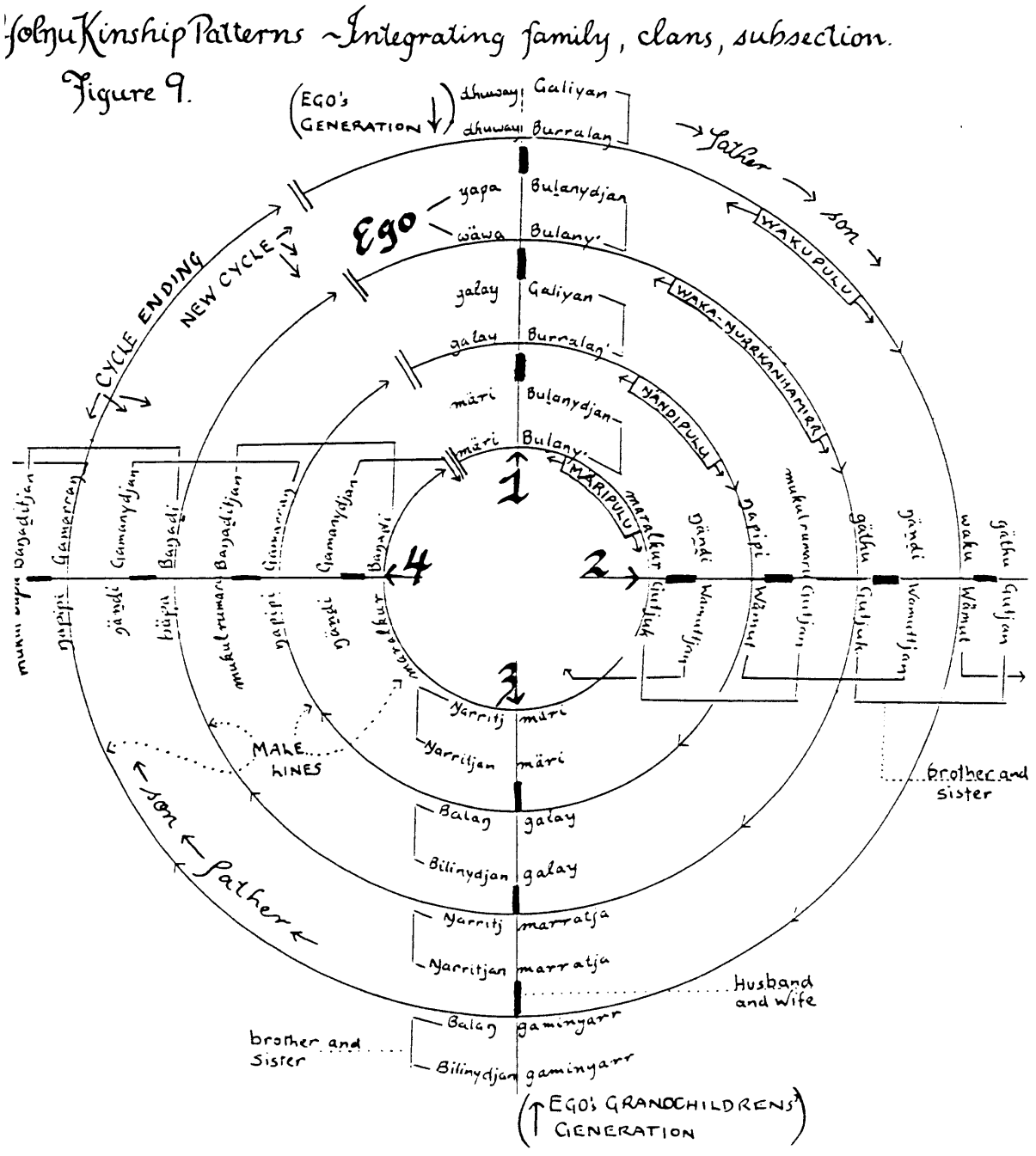
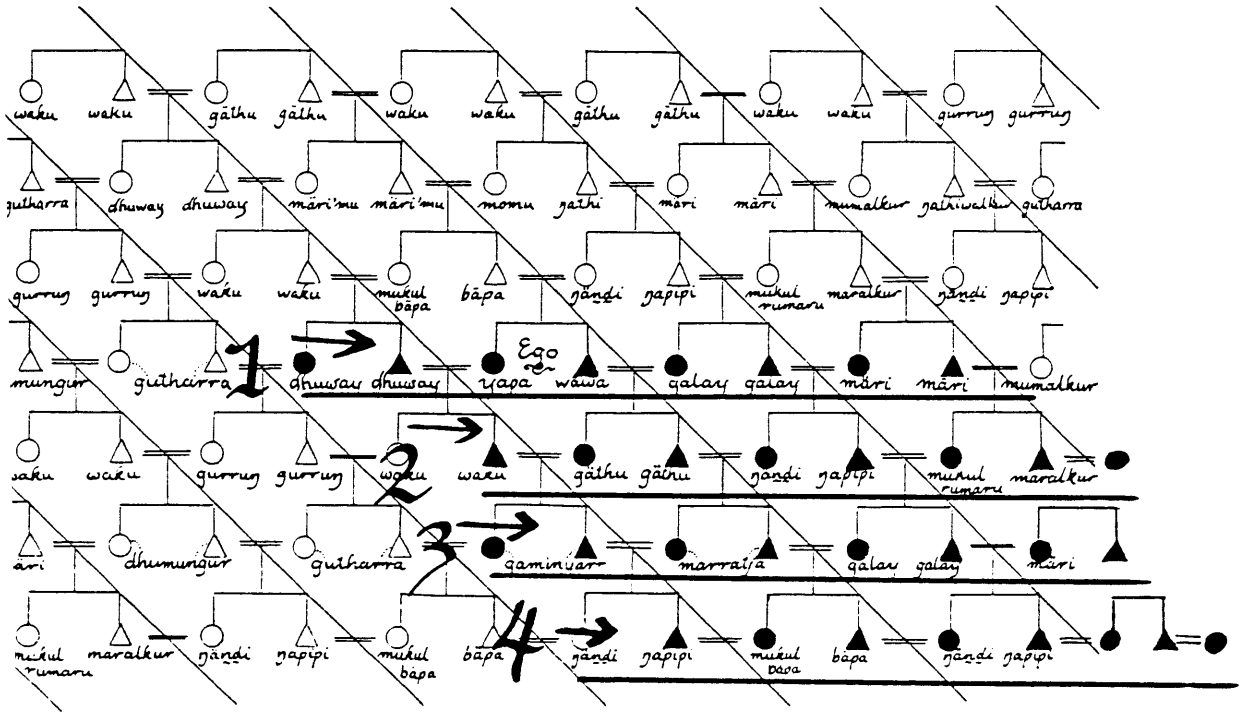


Figure (8) has more elegantly represented the **mälk** system through a circular model. Yet the previous patterns (figures 1 - 7) have been effectively demonstrated by a rectangular model. The rectangular schema can now be transposed into a circular form (figure 9) to demonstrate mathematical order of the corporate Yolŋu kinship system (at the levels which have been discussed).



The diagram has been reduced to manageable proportions by representing only those relations of ego indicated by the solid circles and triangles in figure (10). (The order of arrangement of relatives along the axes 2, 3, and 4 is different from the order along the horizontal lines in figure 10.) To include more of ego's generation and their descendants would simply require increasing the number of circles. The children of ego's generation are located a quarter of a turn clockwise arranged along axis (2), and successive generations occur on axes (3) and (4). Thus ego's great-grandson is located on the same circle as ego on axis (4). Ego's great-great-grandson represents the the beginning of the next cycle and is located back at axis (1), having the same **mälk** as ego and being addressed by ego as **Yukuyuku** ('younger brother').

Yolŋu Kinship Patterns ~ Figure 10.



Ego's generation and their *ancestors* could be generated by an identical schematic structure, except with an altered polarity, that is working around the circles *anti*-clockwise from the axis labelled (1). Thus ego's father (**bäpa**) would be located a quarter of a circle anticlockwise from ego in the position which is occupied by ego's great-grandson in figure (9). As in figure (9) the cycle would repeat after four generations (i.e. a full circle) with ego's great-great-grandfather being located in the same position as ego, with the same **mälk** as ego and addressed by ego as **Wäwa** ('older brother').

This completes my schematisation from a Western mathematical perspective, of several organisation levels of the Yolŋu kinship system's structure. It has demonstrated complexity, integrity and order in the

system and reveals the existence of a Yolŋu mathematical system. However the analysis has not revealed the form which the schema might take in the Yolŋu mind (i.e. the nature of the Yolŋu schematisation of **gurruṯu**). That is to say it has not revealed the form of the mental imagery through which the system is held, nor how it is acquired.