USE OF THESES

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Qualitative Thinking: an examination of the classificatory systems, evaluative systems and cognitive structures of the Yolnu people of North-east Arnhem Land.

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A thesis submitted for the degree of Master of Arts of the Australian National University in March 1983.
I certify that all parts of this thesis describe my own original work. All sources used have been acknowledged.

John Rudder
PREFACE.

The data base upon which this thesis is built was commenced shortly after I moved to Arnhem Land in mid 1964. Throughout the next thirteen years I shared in an exchange process wherein I worked to provide education, at first for Yolnu children and then for the last eight years for adults, while the adults gave unstintingly of their time in attempting to educate me.

While most of the adult men have had some input and it would not be possible to thank them all here, there are some who have made important contributions. At Yirrkala for three and a half years, Mathaman, Narritjin and Larrtjanga laid the initial framework of my training. After a transfer to Elcho Island, Djurral, Djorrpum, Badaltja, and Galpagalpa, together with Djininyini, Rurrrambu, Daygumbu and Wanymuli invested endless patience in explanation and re-explanation of things that I was slow to grasp. Some of them have long since entered into the Dreaming which formed the core of their being. To their families I acknowledge my thanks for what their fathers did.

In early 1981, I was able to spend a further three months at Elcho while I completed the research, and in particular the work on the different colour charts. During this time I again received valuable help from many people. In particular I need to acknowledge Stephen Bunbatjun, Badikupa, and the linguist, Dianne Buchanan.

At the Australian National University, I am indebted first and foremost to Anthony Forge and John Mulvaney who have been a continuous encouragement to me. My supervisor, Howard Morphy has shown great patience, making many helpful suggestions, particularly where I needed
to search for greater simplicity and precision in description and analysis.

In writing the thesis I have been assisted greatly by helpful discussion or criticism from members of several of the University Faculties. In the Department of Prehistory and Anthropology, Anthony Forge and Jim Urry, and in the Department of Linguistics, Anna Wierzbicka, Frances Morphy and Harold Koch have all assisted by criticising various early drafts of the material. Bill Woolcock of the Research School of Physical Sciences and Rick Loy of the Department of Pure Maths in the Science Faculty acted as sounding boards for me in my search for ways to explain Yolnu perceptions of measurement and quantity. To each I give my thanks for the contributions made.

I am grateful to the Australian Institute of Aboriginal Studies for a grant of support through 1980 and 1981 and for bearing the costs of the field trip in 1981. To my wife Trixie Rudder, goes the thanks for carrying the rest of the financial burden and for much other valuable support.

Finally I am indebted to Garry Bow, whose voluntarily assumed task as a proof reader has been greatly appreciated.
This thesis is an analysis of the classificatory and evaluative systems used by the Yolnu people of Elcho Island in North-east Arnhem Land. In the process of examining these systems, I attempt to demonstrate how the Yolnu qualitative approach effects the meanings of the evaluations and classifications made.

In Chapter One, I introduce the relationship between my thesis and current literature. I also give a brief outline of the physical and cultural environment from within which the Yolnu approach the world. Chapters Two to Five contain the discussion of systems of classification in each of four domains. These domains are normally considered as measurement, number, colour and ethno-biology. In each of these, I analyse the systems used, drawing out the structures upon which those systems are established.

The structures established in those four chapters are drawn together in the Conclusion. I demonstrate that the harmonious relation between the structures used in different domains indicates the existence of deeper common structures which, I argue, function at a cognitive level.

My aim is thus to demonstrate the existence of these cognitive structures, and the effect on them of a qualitative mode of evaluation.
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CHAPTER 1.

INTRODUCTION.

The Yolnu, the Aboriginal people occupying the north-eastern quarter of Arnhem Land in the Northern Territory, are a loosely linked group of between three and four thousand people, speaking a number of related dialects. Outside interest in the Yolnu language and culture dates from the first known European contact with them. Robert Brown, who was with Matthew Flinders when he visited Arnhem Bay near Elcho Island, recorded in his diary for February 5th, 1803, lists of Yolnu names for people, botanical specimens and body parts. The first missionary to Elcho, J.C.Jennison, made serious attempts to record and learn language material between 1921 and 1923. He produced an English - Elcho Island Language dictionary of almost a thousand entries (1927:177-192), which included terms for all the colours generally named. Since that time a number of missionary linguists have done extensive work on Yolnu languages, in particular, B.M.Lowe and J.Ross.

Anthropologists who have worked amongst the Arnhem Land Yolnu include C.H. and R.M.Berndt, I.Keen, H.Morphy, N.Peterson, D.Thomson, W.Shapiro, W.L.Warner and N.Williams. These have carried out a wide spectrum of research into social, economic, political, ecological, material and symbolic aspects of the Yolnu society. In addition a number of linguists, psychologists, prehistorians and educationalists have considered aspects relevant to their own disciplines. While I am indebted to each of these researchers in different ways, there has been an almost complete absence of any in depth study of the cognitive aspects of the culture from an anthropological perspective.
Spradley (1972:6) says that the cognitive definition of culture "excludes behavior and restricts the culture concept to ideas, beliefs and knowledge", then quotes Goodenough's 1957 definition in support of his own; "Culture is not a material phenomenon; it does not consist of things, people, behavior, or emotions. It is the form of things that people have in mind, their models for perceiving, relating, and otherwise interpreting them" (1957:167). My own approach is closely in line with these two definitions, focussing on the structures used by the Yolnu in classifying and evaluating a number of aspects of their environment. For the inspiration to attempt structural analysis, I owe a debt of gratitude to the examples set by W.E.H.Stanner and C.Levi-Strauss. Their own structural analyses in fields different from the one I have chosen provoked me into serious consideration of applying a structural analysis to the problems I was concerned with in the cognitive area.

Levi-Strauss (1963:33), taking up the work of N.Troubetzkoy, suggests that the methods of structural linguists suggest four basic operations which can be taken up in applying structural analysis to the social sciences. These are; first a shift from the study of conscious phenomena to their unconscious infrastructure; second, taking as a basis for analysis, not terms, but the relations between terms; third, it focusses on the notion of system; and finally, aims at discovering the general laws by induction or deduction in order to reveal that which gives the structures an absolute character. Earlier he had suggested similar notions (1963:16,17) asserting that the ethnographer's task is to recognise the variations in perspective maintained by individuals and to generalise from them to produce an indication of the wider aspects within which the individual's experience occurs. I have attempted to take up these
notions in the discussions and analyses which follow throughout this thesis. I do move from the conscious surface structures of particular domains to their unconscious infrastructure. I use the relations between terms as a basis for analysis, however it is not possible to understand the relations without an extensive examination of the terms themselves. Thirdly it is the systems with which I am concerned though I have had to go through the application of them in order to find them. Finally, my ultimate goal is to reach the underlying cognitive structures which it appears are on somewhat the same level of analysis as Troubetzkoy's "general laws".

A number of anthropologists have carried out analyses of classifications in single cultural domains, notably those of colour and various aspects of ethno-science, in an attempt to reveal the classificatory structures used in them. However the practice in each case appears to have been to restrict analysis to these single domains. There does not appear to have been any attempt to compare the structures of different domains. The implication of this is that, when the structures in a particular domain are analysed, there is no way that the external observer can verify his results, for he has no way of cross-examining them in relation to the rest of the culture. His recourse is then to compare them with the structures of similar domains in other cultures, and this will not guarantee the validity of his work in relation to the culture being studied.

The single domain studies have been carried further by others who have engaged in the cross cultural comparison of terms and taxonomies, in particular Berlin and Kay (1969) and Witkowski and Brown (1977 and 1978), in their search for cultural universals. The domains selected are of varying significance to the cultures from
which they are extracted, and it has been adequately argued that, in any culture, complexity is relevant to the significance of the domain within the culture. (e.g. Tyler 1969:3,4, and Beals and Hoijer 1977:528-30). Because of the selective choice of domains and the apparent inability to control the variable of relative significance, attempts to compare them cross-culturally on the grounds of complexity have led to some invalid assumptions concerning cultural evolution.

As Beals and Hoijer (ibid:596) suggest, "one of the major problems in cognitive anthropology has to do with the creation of theoretical models that would explain exactly how it is that human beings in general or human beings in different cultures actually process information". It is my contention that the examination of a single domain of a culture, irrespective of the depth at which it is considered, cannot reveal more of the cognitive structures or processes of a culture than are applicable to that single domain. If the cognitive structures or processes of a culture are to be disclosed then a number of domains within that culture must be analysed and the deeper structures within each compared. This is the thesis for which I argue. In doing so I have restricted the analysis to the structures not attempting to consider the processes except in passing. I attempt to establish that, in line with Troubetzkoy via Levi-Strauss, the structures used in the classification and evaluation of items or qualities in different domains can be compared; that these give indication of a deeper level structure to which the structures of separate domains are related. These deeper level structures, that I call cognitive structures can be argued to form a basis for perceptual interpretation of things seen with the eye. It is my contention that the cognitive structures are integrated with and must be understood in relation to a number of basic assumptions about the nature of existence.
This is similar to the argument raised by Witherspoon in his analysis of Navajo culture. He maintains that the "conception of the nature of reality, its operation and constitution, shapes their value orientations, behavioral codes, and classificatory structures" (1977:4). It appears in this that he is implying direct links between the conception of reality and the shape of individual classificatory structures in separate domains. In doing so he is differing slightly from my own approach, for I am arguing for the existence of a deeper level structure related to the conceptions of reality but at a cognitive level, which serves as a foundation for perception and as a foundation for the structures perceived to exist in the separate domains.

This concept of a deeper level cognitive structure appropriate to a particular culture is also similar to, though also somewhat different from concepts discussed by Spradley and Wallace. Spradley, (1972:4) writes of people using rules, cognitive maps and plans in order to organise and interpret behaviour, while Wallace (1965:310), speaks of a "mazeway" of which he says, "I mean the sum of all the cognitive maps which at any moment a person maintains, of self, of behavioral environment, and of those valued experiences or states of experiences which attract or repel him". In the relevant contexts both authors are referring to arrangements used in guiding behavior. The cognitive maps referred to are concerned with patterns of behavioural responses appropriate to a single context, and the "mazeway" is the broader scheme to which all of an individual's cognitive maps are related and of which all the cognitive maps are a part. Thus the concepts of "cognitive maps" and "mazeway" are concerned with cognitive processes associated with behaviour patterns at different levels. In this regard the relation between them is similar to the relation I am suggesting exists between classificatory
structures of separate domains and the cognitive structures which establish their form. The cognitive structures differ from "mazeways" in that the latter are the total of which "cognitive maps" are a part, whereas classificatory structures are an application of the cognitive structures within a particular domain and the latter do not include the former.

One other notion that I have not found discussed anywhere except in the psychology literature is the notion of a contrast between quantitative and qualitative modes of evaluation. I have found an understanding of this to be highly relevant to an understanding of the Yolnu classificatory and evaluative structures. The Oxford dictionary defines "quantitative" as "measured or measureable by, or concerned with, quantity". In these terms, quantitative evaluation is concerned with the assessing of things in relation to one another in terms of size, magnitude, amount, duration or extension, all or any of these being attributes of quantity. In contrast to this, "qualitative" is defined as "concerned with or depending on quality". Thus a qualitative evaluation is concerned with the attributes, properties, special features, characteristics or nature of things. In contrasting the two, a quantitative assessment of anything is concerned with the dimensions of the attribute for which the thing is being assessed, whereas a qualitative assessment of that same thing is concerned with the nature of the expression of that attribute.

A simple example of the differences between these two modes of evaluation, one which is met with throughout this thesis, is the meaning of the "negative" evaluation of any attribute. From the perspective of quantitative evaluation, the Yolnu word bâynu (usually translated as "nothing") means the "non-existence of an attribute", 
but from the perspective of qualitative understanding and evaluation, bâynu means "the non-expression of the particular attribute" not the cessation of its existence.

Jean Piaget asserted that "if we quantify a quality we have to measure it sooner or later" (1974:viii) and it appears from his writings that he assumed that quantifying or quantitative evaluation was a human universal. It is my assertion that the Yolnu do not use any form of quantification or measurement, but that all their evaluations are qualitative. I am not suggesting that stages of progressively more logical thought, which Piaget has so conclusively shown to exist in Western society, do not exist in Yolnu society. The implications of the above assertion are that linking those stages to the development of quantification is an incorrect practice.5

The argument in favour of strictly qualitative evaluation is supported clearly by Seagrim and Lendon (1980) in their work testing Piaget's hypotheses in Aranda communities. They demonstrated an apparent lack of quantitative concern, making the observation that even material "exchanges that occur ... involve qualitative not quantitative equivalences" (p 201). Thus it would appear possible that for traditional Aboriginal society in general, and not just Yolnu in particular, the focus of evaluation is qualitative in contrast to the basically quantitative evaluations made in Western societies.6 One of the prime functions of this thesis will be to demonstrate the effect of this contrasting mode of evaluation on Yolnu classificatory, evaluative and cognitive structures.

Originally hunter-gatherers, the Yolnu are gradually adopting a more settled lifestyle in a number of small towns.
along the coastal fringe, and at small homeland centres scattered throughout the whole area. These latter, often little more than an airstrip and a few shelters, are on land traditionally associated with particular small groups. The people living at the centres use their traditional knowledge and skills for obtaining a proportion of their requirements, but supplement these with supplies from the nearest town such as; flour, sugar, milk, tea, tobacco, clothing and ammunition brought in regularly by small plane. For the town dwellers, hunting and gathering is a regular weekend activity.

Living in an area with a monsoonal climate, the Yolnu experience a distinct wet season from December to April, and a distinct dry season from May to November. The coastline, largely mangrove flats interspersed with sandy beaches and periodic rocky promontories, is broken by tidal rivers lined with mangroves. These rivers are fed during the wet season by vast freshwater swamps which fill and drain annually. The swamps are backed by rough hills or higher ground covered with open Eucalyptus forests. Scattered throughout the country, generally on sandy or lateritic soils, are areas of rainforest locally called "jungle". The sea is shallow, and with the rise and fall of the tides very wide expanses of mudflats and mangroves, sandy bays and reefs are exposed twice daily. Thus they have a wide range of ecological zones from which to extract their requirements. From their perspective, there is an absolute regularity in the cycles of presence or absence of rains, the filling and the draining of the swamps and the ebb and flow of tides. As a result they see a regular cycle in the availability and location of resources. From the Yolnu perspective, this environment is unchanging and the resources to meet their needs are always available whether these be basic foods, pigments for painting, or raw materials for pragmatic or ceremonial use.
The small patrilineal descent groups which together are the Yolnu, can be separated into two broad divisions on the basis of the geographical section of the country that they occupy. Some of these groups are almost entirely associated with the coastal areas, having a predominantly marine hunting environment, while others are almost entirely associated with inland areas and have a hunting environment associated with freshwater swamps and streams. The Yolnu clearly distinguish these two broad divisions, terming one of them monukpuy (associated with / belonging to the salt water), and the other diltjipuy (associated with / belonging to the back country). In relation to the classification/identification of elements of the physical environment each person has a generalised knowledge of the whole region but each also has a more specialised knowledge of the items in his own broad geographic division. Thus coastal people have a far more comprehensive knowledge of the natural species of marine and coastal areas, while inland people have more knowledge of the species of freshwater and hill country habitats. While access to secular knowledge appears to be unrestricted there is in this way considerable variation in that which is known by different individuals.

In a similar manner, the differences in secular knowledge held by the different sexes is one associated with the degree of specialisation rather than with exclusion. Thus the men with their specialisation in the provision of fish and the larger land and marine game, tend to have a more intense knowledge and a larger vocabulary associated with their specialisation. The women with their concentration on gathering vegetable foods, crustaceans, and shellfish, tend towards a complementary specialisation of knowledge in those areas. Small game, being collected by both sexes, appears to be equally well known by both.
I did not discover any restrictions associated with rights to secular knowledge. From earliest childhood, learning is both by imitation of those older than themselves, and by trial and error. (Harris, S. 1977). By the age of puberty, girls used to have knowledge and skill adequate to provide the basic needs of a family. A change in this has occurred in that the children are now in school until they are fifteen or sixteen years of age and while they tend to gain a head knowledge of the natural world, most do not have the practical experience. For example, one sixteen year old who was working for me was familiar with over ninety percent of the plant names, but admitted to being able to identify no more than ten percent of them. This was apparently due to the fact that she had only been hunting with her mother on occasional weekends. There is every indication that many of the young people on leaving school are beginning then to learn much that they have missed because of isolation from their homes at an early age. There is indication too that the schools are beginning to find ways of overcoming this loss. Older people are valued, among other things, for their immense knowledge of the territory and its resources; knowledge gained through a lifetime of learning and experience.

In my search for classificatory systems and their underlying structures, I have chosen for analysis four semantic domains. These are normally considered to be; the evaluation of properties of physical matter, the evaluation of quantities of discrete items, the classification, naming and evaluation of colour, and the classification of the physical environment. My primary reason for choosing these four domains is that they all concern elements of the physical world in which the Yolnu live. That is, these concern the fundamental substance on which they depend. Secondly, two chapters, those concerned with
colour and the classification of the physical environment concern
domains much discussed in anthropological literature. I considered it
important, to balance my own focus on the structures applied to the
two domains, with the need to place the discussion of them in the
context of the literature. It was also important to describe Yolnu
perceptions in a way that makes it possible to compare them with that
which has been recorded concerning other peoples. Chapters Two and
Three deal with domains normally considered to be focused on
measurement and quantification. It was essential for me to
satisfactorily deal with these two domains if I was to demonstrate
clearly the application of qualitative assessment.

In each of the four ethnographic chapters, I draw out the
structures of the evaluation or classification systems relevant to
the particular domain. I also make a distinction between two bases
for classification and evaluation. The first of these, being bases on
the material properties of items being considered, I have termed
pragmatic or physical. The second, based on spiritual or supernatural
attributes, I have described as metaphysical. In chapter six, I draw
together the abstract forms of the structures of each of the
systems used. There I discuss the relations between the forms of the
structures used in different domains and demonstrate that structures
can be shown to exist at a deeper or cognitive level, structures
which I suggest are formed in relation to certain cosmological
assumptions.

I am indebted to Mary Douglas (1966 and 1968) for notions
associated with the defence of boundary. As I did the analysis, these
helped me to interpret the ways in which Yolnu classifications are
strengthened by their perceptions of the boundaries of classifications.
I argue that, at the boundaries of classes, a dimensional shift occurs such that while items do not necessarily become taboo or dangerous, they do enter into new states of existence, changing the outward expression of their existence but continuing their essential existence in a new form.

In carrying out the analyses, and in the collection of the data I have been conscious of wide variations. As Roy Ellen says (1979:357) "diversity is part of the system". Some aspects of this I have already mentioned. The Yolnu appear to consider that there is within the system, absolute truth, and an absolute classification for every item. Some of the people working with me took considerable pains to check information with the old men or old women before identifying particular specimens or items. While this was a common occurrence with the unusual, the normal practice appeared to be to make very positive identifications. Tactful cross-checking whenever this was possible revealed many variations. In particular to take one example from the research associated with chapter five, the identifications of owls, hawks and small shore birds seemed to vary from person to person and from occasion to occasion. The best that I was ever able to achieve with these birds was something like a calculated guess at the "most likely to be correct" term.

In the chapters which follow, the meanings of terms, the classifications, the evaluations and the systems are all discussed in detail. This is necessary but they are not the central issue. My aim is to demonstrate the existence of the cognitive structures, the relation between them and the classificatory systems, and the effect on the whole of a qualitative mode of evaluation.
NOTES.

1: The word Yolnu, literally "person", is used by the North-east Arnhem Landers to refer to themselves in contrast to other Aboriginal groups or in contrast to non-Aboriginals. It appears to have now gained general acceptance in Anthropological writings as a name for the people. Warner (1958) called them the Murngin, Berndt (1952) the Wulamba, and Shapiro (1969) the Miwuyt.

2: It appears that there has been no generally accepted solution reached by linguists, to the problem of the distinctions between the various small language groups. The Yolnu distinguish at least six major groups, and well over twenty sub-groups.

3: The spelling used throughout for vernacular words follows the practical orthography established by B.M.Lowe. (1975)

4: This includes their evaluations of domains discussed in chapters two and three, normally considered to be domains of measurement and numerical quantity.

5: Piaget mentions other aspects than quantification in association with the progressive stages of development. The focus of investigations to this point in time appears to have been almost inevitably linked to testing of the development of the associated stages of quantification, with the assumption that this was testing the stages of development of logical thought. I hope that one of the outcomes of this thesis will be to demonstrate that they are not indivisibly linked. There is a vast field of research open to cross-cultural psychologists and educationalists in determining
what are the indications of the developmental stages of logical thought in non-quantifying, and indeed in non-western societies.

6: Thomson (1949: 51-53 and 77-94) indicates clearly from his observations of ceremonial exchange, that the Yolnu focus their interest on quality of social value rather than on quantitative or economic equivalence in exchange.

7: Three major centres were established in the Yolnu area by the Methodist church; Milingimbi (1923), Yirrkala (1934), and Elcho Island (1942). These are now small towns managed by Yolnu councils. The material discussed in this thesis was gathered primarily at Galiwinku, the town on Elcho Island.

8: The terms "old man" and "old woman" are terms of very real respect.

9: See Rudder 1977:Section 2:4.3.2.

10: Hallpike (1979:489) claims that, "It is far more fruitful to regard primitive thought as based on an incomplete logic rather than on a different logic from that which we know and indeed, as far as I am aware the possibility of a wholly different logic has never even been demonstrated". It is my purpose in this thesis to examine the possibilities of "qualitative thinking" as a different logic, complete, and structurally sound, while being contrastive with the "qualitative thinking" of much of "non-primitive" society.
CHAPTER 2.

CONCEPTUAL STRUCTURES REVEALED IN THE EVALUATION OF PROPERTIES OF PHYSICAL MATTER.

In this chapter I consider the ways in which Yolnu evaluate the properties of physical thing. In the sense I use "physical" it could include; materials known in the past such as wood, fibre, water, stone and clay; new materials such as steel and plastics; and various elements of the living and physical environments such as animals, humans and their artifacts, plants and their products, and features of the landscape. These are assessed in accordance with the quality of the distinguishing features which are the basis of their identity.

The Yolnu structure their evaluations as if physical matter had two general forms. In one form, items are seen as having a discrete structure. For example, items such as trees, fish, implements or humans can be distinguished as separate entities. The other form is an amorphous one. However in some circumstances items which would normally be considered as having a discrete structure are treated as though they were amorphous substances. That is as if they were enclosed within a container or a boundary. In that situation, their discrete structures then become irrelevant and one can speak of a canoe full of fish, a basket full of lily roots or a camp full of people. Separate evaluative processes are applied to the two forms.

I have chosen for discussion, the evaluations of materials in relation to a limited number of properties. Length, girth, size, structural strength and density are evaluations applied only to items with discrete structure. Temperature evaluation can be applied to
items of either form. Volume is an evaluation applied to either amorphous substances or to discrete items when they are perceived to be enclosed in a container or within a boundary.

In the discussions which follow I attempt to demonstrate that Yolnu evaluations of these qualities are not measurement. In doing this I show how these evaluations are carried out, and I examine the evaluative system to show how the structures make it possible to evaluate without measurement.

LENGTH.

Any examination of the Yolnu evaluative system raises a number of issues. I make an introductory examination of a number of these in relation to a number of examples of evaluations of length. The issues discussed are; the question as to whether the evaluations are based on absolute standards or not; the nature of the relations between opposed qualities; the structure of the evaluative system; problems associated with the evaluations made in relation to ideals, and the question as to whether comparison can be equated with measurement.

i: Concerning the standards used in evaluation.

Mandjuwi had a team of men organised to chop out a dugout canoe (plate 2:1) from the fairly substantial log of a gulu tree.\textsuperscript{1} It had been cut in the jungle and dragged in by tractor to a position near the craft room. There it could be worked on easily. Manydjarrri, the only man I ever saw do any work on it,\textsuperscript{2} was standing examining the axe prior to commencing the day's work. In our conversation I asked him about its size.
Q: Nhāthinya djaka³ dhuwal?
What quality(of) linearity (is) this?
A: Yow? ... ... Mārr ganga weyin.
Who knows? Moderately long.

Q: Yakana dhumbul?
(It is) not short (one)?
A: Yow. Weyin ... mārr ganga.⁴
Yes (it isn't short). (It's) long ... (well) .. moderately.

Later I asked one of the other men the same question. His very emphatic answer was,

Mirithirr weyin dhuwal ..... weyin mirithirr.
(Its) very long this (one) .. long very.

In this discussion of Mandjuwi's canoe are indications that there are no units or standards of measurement used by the Yolnu. In the situation, no reference is made to a quantity of length, and the two evaluations made are quite different. *Weyin* (long) is not a measurement unit but an attribute or quality of the canoe. Its meaning can be effected by different variables. Each of the men has a definite idea of the normal or average length of a canoe and one aspect of the meaning of the evaluations is related to that. However beyond the actual evaluations made there are further implications. Manydjarri's evaluation of "moderately long" carries with it implications of his experiences in the bush, living traditionally, and the notion that, compared with the canoes he has been associated with, this one is not particularly noteworthy as regards its length. While calculatedly not boasting about his present involvement, he is yet, in making the evaluation, making a subtle statement about himself and his skills as a craftsman. By comparison, Liwukan's evaluation of "very long" has quite different implications. There are at least two of them. It appears firstly that he is intent on conveying
Plate 2:1. Dugout canoe, filled by wet season rains and still incomplete at the time I left Elcho, three months after it had been commenced. During that time I noted only one day of work spent on it.
impressions associated with the very real value of the operation being carried out. In the evaluation he gave he is indicating that the canoe's construction is a noteworthy effort, an example of the achievements that Yolnu can make. Additionally he is communicating that the finished product will be of high quality and the workers worthy of high remuneration.

So weyin means "long" but an evaluation of weyin means many things. Some of these can be communicated by adding either of the modifications of "very" or "moderately" in particular contexts, others by voice inflections and gestures which are not readily recordable. In no way can weyin be considered as a standard or absolute of measurement. Nevertheless it is the generally accepted meaning of the word as a classification which enables its use to express meanings other than this "basic" one. So the meaning conveyed is relative to the context of its use, but relative also to that generally accepted meaning.

ii: Concerning the nature of the relations between opposed qualities.

The question to be considered is, "What is the nature of the relations between oppositions, and how are these effected by the Yolnu qualitative approach to evaluation?"

Galpagalpa was narrating the story of the spinning of the first turtle harpoon rope. As he did so he described the progressive stages in the increase of its length, relating the length of the rope to the distance between where we were sitting and the position of particular trees. At first as the creators were making the rope it was gurriri (short), it was also raki (normally translated as string,
cord or rope). "They passed the shuttles from hand to hand and as it ga weyinthirra (was becoming longer) they coiled it up. It was still raki. They continued on and on. 'Let's check it out'. One of them piched up the end and pulled it out. Do you see that yawuny, (a Grevillea tree about 80 metres away). It was that djaka (quality of linearity). At first it was raki like that. (pointing to a tree about 10 metres away), but now it is rawu (the turtle rope). It is good and complete."

That the turtle rope is expected to have certain attributes is shown in the narrative. From a Western perspective, using a quantitative evaluation, the rope can be measured and described as having a length of something like eighty metres. From Galpagalpa's perspective, the rope had a linear quality of a particular type which could be compared to the spatial relationship between himself and the grevillea tree. It was not a measured length, but he had a notion of a particular attribute of the quality of linearity. There are for Galpagalpa, and for the Yolnu in general, two ways in which the quality of linearity is expressed. One of these is gurriri (short) and the other is weyin (long). Each of these, while remaining distinct from the other is differently expressing the attributes of djaka (linearity). Rronan, while he was attempting a definition of djaka emphasised both the separateness of the oppositions and the overall nature of the category "linearity". He did so as follows, "Djaka mean is ... doesn't matter whether he's skinny or yindi (big) or yindi mirithirr (very big) long as he's weyin (long). Djaka is both weyin (long) ga dhumbul (and short), but long one is weyin and short one is dhumbul".
From a quantitative approach, the two qualities "long" and "short" are perceived as particular measurable lengths along a graded continuum of lengths from zero to infinity, all of which are different expressions of the measurable quality of linearity. According to Sapir (1949:122) this process of grading is a pre-requisite for measurement and counting. "Long" as a quantitative evaluation is relative to the expected normal length of an object. For example, a "long" snake is different from a "long" rope. In each of these evaluations "long" is perceived to be relative to a continuum of various lengths which express varied experiences of different length snakes or ropes. From this perspective "long" and "short" are quantitative opposites deviating from the expected average in opposite directions. It is the particular deviation from the average which indicates whether an item is to be classed as long or short. An average rope is simply average.

The Yolnu approach the same objects differently. The two aspects of linearity, "shortness" and "longness", are seen not as a part of a graded continuum, but as two discontinuous, separate entities. There is a mid-point between them but it is not an average expression of linearity. Rather it is place where the attributes "long" and "short" are both partially expressed and neither is fully expressed. Any item which is an average length for its kind (when considered from a quantitative perspective) is perceived to express both "moderate longness" and "moderate shortness" (when considered from the Yolnu perspective). An item such as the rope in the narrative can go through a process of change such that it begins to express the opposite quality, but that new quality is not fully expressed until the original attribute has ceased to exist. Thus the true opposite of "short" is "not short".
It is then possible to suggest that for the Yolnu, one quality is the form taken by the "non-expression" of its opposite. This suggestion will be supported by further evidence in this and successive chapters.

The separateness of the two qualities and the process of change from one to the other are exemplified in Galpagalpa's narration. The original narrative is quite extensive, with the duration of the narrative expressing the duration of the process, including the stops for meal breaks and for sleeping. In the condensed version above, that which is initially begun cannot express the nature of the turtle rope because turtle rope is long. That which is begun is short and not turtle rope though it will be one. It will express the nature of turtle rope, its potential to do so is there (Rudder 1980) even in the fibres before they are collected from the bush, but at its commencement it does not do so.

This perception of "not long" being "not turtle rope", is emphasised by the change in vocabulary. That which is commenced is raki, the general term for string or cord, and it remains raki while it goes through the process of "becoming long". Eventually, at the end of the process it has not only "become long", but is rawu, the turtle rope, fully expressing the right attributes. It is not a "long raki" when it is completed, but it is long and it is then rawu. This narrative then, in using the contrasting vocabulary to express the contrasting nature of the two qualities, emphasises the discontinuity that is perceived in the nature of the opposition between them. Lexical changes are frequently used in this way expressing the discontinuity between opposite expressions of a particular quality, this also will be further demonstrated in later sections of this and later chapters.
The attributes by which an item is identified frequently include particular physical aspects, and as I have shown in relation to the linear quality of rope, there is not infrequently a lexical change which correlates with an opposition in the expression of those physical attributes. Another example of this can be drawn from perceptions associated with the paperbark tree (Melaleuca cajuputi). An immature specimen of the tree is named munuymunuy, and one of its attributes is that it is "not weyin" (not tall). A mature specimen, one with a copious supply of the papery bark is called badaarr, being perceived also to be weyin (tall). Munuymunuy is considered to be "not badaarr" though it is recognised as an immature specimen. It cannot be badaarr until it is mature, because of the non-expression of the attributes of badaarr.

So the nature of the relation between a pair of opposed qualities from a Yolnu qualitative perspective appears to be first one of discontinuity, and secondly one in which each quality can be seen as the negative expression of, or the form taken by the "non-expression" of, the other.

iii: The structure of the evaluative system.

In the two preceding sections I discussed terms for "short", "long" and "linearity", and the relation between them. It is essential, before proceeding further, to consider the structure of the evaluative system in which they are used, and the moderations of the terms used.

First, djaka is not an evaluative term, but is used to identify one of the sections of the evaluative system, referring in so doing to the attribute which is characteristic of that particular section,
that is "linearity". Secondly, I have argued that the terms for "long" and "short" are relative to the context of their use. However, their application in a variety of situations can only have meaning if there is some ideal of meaning to which their varied applications can be related and from which they can therefore gain meaning.

In an attempt to discover some absolute of meaning I carried out a number of experiments with different very patient Yolnu men and women. Using different groups of items I asked them to tell me how long each item was. Once a set of evaluations was made I would add items, either outside the extreme limits of the set, or in an intermediate position. In each case the original evaluation was happily altered. I tried it with cultural items, non-cultural items, and mixtures of both, then with groups of things that obviously did not go together in a single category such as knives, men and roads. The evaluations were always made in relation to the context of the set under construction. The length of knives was relative to the set which could be called, "all imaginable knives". The "length" of men was relative to the known range of men's heights. It was even possible to make evaluations in terms of a set which included in its consideration the lengths of all the things normally found in the natural environment. The range of terms used in making all of these evaluations is shown in figure 2:1.

The normal approach taken by the Yolnu, even when unaware that I was about to ask what to them must have often appeared to be a set of irrational questions, was to give an item a classification of "moderately long" or "moderately short". This meant that no matter what followed, their first classification was always right, even if they changed it. That is, if the first item was classed as "moderately
long"the classifications above it and below it in the above figure were also being made. If an item was "moderately long", it was automatically also "moderately short", either classification being not a denial of the other but a matter of focus. Similarly by being "moderately long" on the level of specific classification it was also expressing the evaluation of "long" on the level of general classification. It was usually only after the expected set had been established that the "very short" and "very long" terms were used. If then additional extreme items were introduced, either the previous "very ..." classification could be shifted to the general class and the new item given its place, or the "very ..." evaluation could be given to the new one in such a way that the first syllable of
mirithirr (very) was emphasised. That would indicate that the new item was "extremely, very ...", linking it to the previous extreme like a sub-classification of it at an even more specific level, without needing to suggest that the previously made one was wrong in any way.

In this way the system is flexible, allowing for alterations to be made to given classifications without needing to consider the previous ones as faulty. The classifications if they can be said to have an abstract reference, are related to the contexts which set the limits to the set being evaluated. That is, the generally expected length of any item functions as a standard or ideal to which other items of the same category can be related.

iv: Classification in relation to ideals of length.

In the craft room over a period of time, there accumulate quite large collections of spears of various kinds; assorted hunting and fishing spears, decorated spears and spearheads. Ostensibly these were made for the tourist industry, but on various occasions different Yolnu men would come to buy spears for themselves, their sons or their friends. Whether the occasion was a weekend hunting or fishing trip, a ceremonial event or a coming long weekend sporting carnival with its spear throwing competition, the Yolnu customers always had a particular purpose in mind for their purchase. They also had a notion of the ideal spear to suit the purpose being considered. On occasion, choices were made very seriously, but at other time light-hearted banter flew quite freely. It was not abnormal for a very long spear to be offered to a very short man or a very short one to a tall man.
The ideal spear has a number of qualities by which it is assessed such as straightness, balance and length, all of which vary according to personal preference. A tall man finds a longer spear more comfortable to use and a short man by comparison prefers a short one. Thus the ideal varies from man to man. The spear with a length which approximates the ideal is manymak (*good or just right*). One which is considered to be the perfect example of the ideal is mirithirr manymak (*very good or excellent*). A spear which is at the limits of acceptability whether that is because it is too long or too short but still useable is märr manymak (*moderately good*). It could also be classed as märr yatjkurru (*moderately bad*), märr weyin (*moderately long*) or märr gurriri (*moderately short*), because the deviation from the ideal is a deviation in terms of length.

In this way, when length is evaluated in relation to an ideal, a second set of oppositions, "good" and "bad" is superimposed over those associated with linearity. Both systems are equally flexible and the relations between the two systems are also flexible. For example, in the evaluation of spears, "good" is not usually equated with either "long" or "short", but at some mid-point between them. There are however exceptions to this as I demonstrated in the earlier narrative of the turtle rope, where "good" was equated with "long". In the practical applications of these systems it is normal when an item does not meet the ideal for it to be evaluated by the qualities which cause it to fall short of the ideal rather than to classify it as yatjkurru (*bad*). This is so in relation to the creation of turtle rope where less than the ideal is classified as "short". "Long" was "good" but "short" was not "bad". For the Yolnu it appears that only the item which is not useable at all is "bad" and often items evaluated as far less than the ideal will be used, hence the tendency
towards a more descriptive evaluation. Judging from the way in which yatjkurru together with its modifications is used, it would appear more frequently a registration of the user's displeasure with the item than an objective evaluation of its qualities.

Figure 2:2. Potential relations between value judgement and length terms.

In figure 2:2, I have attempted to indicate the flexible relationships between the two systems. For example, when the "ideal" is related to a personal evaluation, then "good" will be neither "short" nor "long", as both these qualities are equated with the
category "bad". However, if "very good" equates with "very long", then "very short" and "very bad" can be equated. Thus while the relations between terms within each separate system remain fixed, the relations between the two systems alter according to the contexts of their use.

v: The relationship between qualitative comparison and quantitative measurement.

The last question to consider in relation to length is concerned with the Yolnu use of comparison in evaluating it, and the relationship between that and the process of measurement.

In narrating the turtle rope creation story, Galpagalpa compared the completed rope with the distance between ourselves and a grevillea tree. In comparing them he is not concerned with measuring one against the other, but he does have a perception of the lineal quality of the rope which he equates with the lineal quality of the space between the tree and us. I quoted Piaget earlier as asserting that, "if we quantify a quality we have to measure it sooner or later", (1941:viii). In the above examples the two items are compared and found to both express the quality of longness. However it is the quality of the items, and not the quantity of their lengths which is being compared in Yolnu evaluations.

From the perspective of quantitative evaluation, the English translations of the "not good" categories of linearity would be "too long", "too short", "very much too long" and "very much too short". These do not however form correct translations of the meanings of the Yolnu terms, as the Yolnu terms are not categories comparable to one another along a quantified continuum. They are
separate classifications in a finite set of classes with each class expressing specific attributes. The classes are compared as relative expressions of the quality. In this approach, the focus is on the quality of particular qualities, and it is this that I call qualitative evaluation. Using it, it is possible to make comparisons that are non-quantitative and hence not measurement.

**WEIGHT, TEMPERATURE, SURFACE TEXTURE AND STRUCTURAL STRENGTH.**

In the discussion of these four physical properties, I consider further aspects of the evaluative system not considered in relation to length. These demonstrate various amplifications of the basic evaluative system. One major contrast between the evaluation of length and of these four domains, is that in none of these is there a term which is used to identify the section of the evaluative system.

1: Terms used in evaluation.

There are three terms for weight. first there is a pair of terms in opposition, **jonu** (heavy) and **damba** (light), which are modified by the same words "very" and "moderately" as were used to modify length terms. These are shown in figure 2:3 above. **jonu** refers to all heavy things including small items of high density. **Damba** includes both large and small things which are light. It was defined by one man as "like cuttlefish bone or small dry wood". The third term **rurrwala** defined by the same man as, "very light like polystyrene foam, or as a leaf in the wind ... requiring no energy to move it". In this way **rurrwala** functions as a special classification of a quality of weight which is "beyond the expected limits of very light".
Gormur (hot) and guyinārr (cold) are the pair of opposed terms used in assessing temperature. In figure 2:4 I have shown the relations between these terms and their modifications. There are also two additional terms for particular qualities of cold beyond "very cold". These are dātimirr (brittle cold - so cold that it may break with a snap) a term used sometimes by a man to describe how cold he feels when coming in frozen from fishing, and nāyamunun (unnaturally cold to the touch, as a corpse).
Both weight and temperature are relative to many factors such as the expected quality of an item, its relation to other items in a set being evaluated, and to the emotional feelings of the person making the assessment. The "basic" meaning of the terms appears to be established in relation to the human body, temperature evaluations being relative to body temperature, and weight to the amount of effort required to lift or move an item.

The surface texture of objects or of large areas is evaluated in terms of "roughness" and "smoothness". It appears that while there is a commonly used pair of opposed terms which characterise these general qualities, the opposition is between two sets of terms. One of these sets of terms refers to a particular attribute of "smoothness", and the other to the attributes of "roughness". These are shown in figure 2:5. The smoothness terms are laparra, (smooth and flat like a cement floor or still water), buyuwuyu, (smooth, flat, glossy surface), gayakgayak (slippery), and rirriwiya (smooth and hard). Any of these can be opposed to any of the following roughness terms; dhirrkthirrk (rough), lulnyin'lulnyin (a pitted or potholey surface), and dunutunumirr (a lumpy surface). These last two

![Figure 2:5. Relations between terms used in assessing surface texture.](image)
terms are considered as opposite kind of roughness and hence as forming a supplementary opposition to each other as well as being opposed to the smoothness terms. Modifications "very" and "moderately" while they can be, are not commonly applied to these terms.

The relationships between terms associated with structural strength are shown in figure 2:6. There is a commonly used pair of opposed terms, yalgi (weak) and däl (strong) which are used with the modifications. Supplementary to this is a second pair of opposed terms which classifies material in accordance with the way it breaks. Thus yolu'mirr (soft and weak) describes wood which breaks easily without a "snap", or a person who is weak and flabby with no strength. Its opposite quality, dätimirr (hard and brittle) describes wood which breaks with a "snap". Each of this pair together with three other terms identify precise qualities of weakness or strength. These are

![Diagram showing relationships between terms used in evaluating structural strength.]

Figure 2:6. Relations between terms used in evaluating structural strength.
rirrikingin (*crumbly with a granular texture*), gakanjan (*crumbly with a powdery texture*) and belpil (*pliable*). In addition to these terms which describe precise qualities there is the word wundanjarr (*very hard/very strong, of exceptional strength*). This appears to describe a qualitative increase in strength beyond the intensity of "very strong" to the extreme where it classifies a quality which is beyond the limits of normal expectations.

ii. Further considerations related to the structure of the evaluative system.

In the assessments of each of the four properties of matter being discussed, a pair of opposed terms forms the basis of the evaluative system. These, operating on a general level, are then potentially added to by a set of modifications, which function at a more specific level. It is this pattern of classifications which forms the basis for the evaluative system shown in outline in figure 2:7, which can be used to evaluate any property of matter.

In this diagram, there appears to be a problem in the inclusion of the categories "quality A" and "quality B" in both the general and specific levels of classification. They do however operate on both levels. On the general level, a classification of "not quality A" is the same as a classification of "quality B". When the focus is on this general level of the system, any of the specific level classifications can be seen to be included within the general category. For example, "very A" and "moderately A" are both "quality A" though on the specific level they are in opposition to each other. When evaluation is focussed on the specific level, the "very quality A" and "moderate quality A" classifications are seen in contrast to that of "quality A" on the same level.
Further to the problem of the use of "category A" classifications, one of the younger men recorded information from Galpagalpa on the Yolnu use of medicinal plants. Briefly, the treatment for an injury by a stone spear was to bathe it with an infusion made from pandanus leaves. "He will become well by means of that medicine, pandanus and water, salt water or fresh water, gormur (hot) water, like that but not gormur (hot), just märr garga gormur (moderately hot) and treat it with that. That's the way to treat stone spear wounds".

In this passage, Galpagalpa is making a precise distinction between "hot" and "moderately hot". This is not simply a contrast between two levels of classification, but a contrast between two classifications at the specific level. Clearly this gives an indication that the "general" term can function on both general and

<table>
<thead>
<tr>
<th>General Classifications</th>
<th>Specific Classifications</th>
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<tbody>
<tr>
<td>quality A</td>
<td>very/intense quality A</td>
</tr>
<tr>
<td>not quality B</td>
<td>quality A</td>
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<tr>
<td>quality B</td>
<td>moderate quality A</td>
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<tr>
<td>not quality A</td>
<td>quality B</td>
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<tr>
<td></td>
<td>moderate quality B</td>
</tr>
<tr>
<td></td>
<td>very/intense quality B</td>
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Figure 2:7. Outline of structure of basic evaluative system.
specific levels of classification. Later documentation in successive chapters further supports the choice of this solution to the problem.

In the practical situation, when evaluations are being made, the initial choice appears to be between the pair of opposed terms at a general level. If the situational context demands it, supplementary evaluation will then be made at the more specific level. This indicates that qualitative evaluation is based on a two dimensional choice, the first being the assessment of the quality, and the second being concerned with the intensity of the expression of the attributes of that quality or perhaps, the quality of that quality.

Distinct from the basic evaluative structure are those aspects of evaluation shown in figures 2:5 and 2:6, in which a number of terms are linked to either or both of the general oppositions as referring to aspects of them. In that way, "weak/brittle", "crumbly/granular" "pliable" and "crumbly/powdery" are all more precise classifications of aspects of the general term "weak". Similarly, "rough/potholey" and "rough/lumpy" are subsidiary, more precise classifications of aspects of "rough". These terms represent more specific definitions within the general quality, and form a set of sub-classifications of it. They are not associated with the intensity of its expression but form the basis of a second classificatory process which is used in conjunction with the first. The first was based on the concentrations or intensities of a particular quality. This second system is based on the discrimination of sub-classifications or variations of the quality, and indicates the use of a second classificatory structure.
I have also discussed a number of terms which represent the evaluation of an increase in the intensity of the "intense quality" classification. These terms were rurrwala (weightless), which represents an increase in the intensity of the quality of "intensely light" beyond the boundary of the classification, wundanajarr (hard/strong), beyond the limits of "very hard/strong", and dätimirr (brittle/cold) and ɲayamunuŋ (deathly cold), both of which are beyond the limits of natural cold. These terms indicate particular perceptions associated with boundaries of qualities. There appears to be a notion that there is some sort of limit to increase in the concentration or intensity of expression of a quality. That beyond that limit something non-natural has happened. That point is indicated by a change in vocabulary which matches the beyond-natural intensity of expression of the quality. It is not that the quality is changed, but that its expression has undergone a transformation. This notion then links with the nature of the perceived relations between oppositions. In both the relation between natural and beyond-natural, and the relation between oppositions, there is a perceived change in the expression of a quality. When the Yolnu are evaluating items which express these qualities, there appears to be a choice possible between the "beyond natural" and the "very .... " classifications. That is it seems that either evaluation can be applied. This in turn appears to indicate that the item is in a transition state, partly "natural" and partly "beyond natural".
There appear to be two different quantitative approaches to the evaluation of substances which have an amorphous structure. The first of these establishes fixed standard units and uses these to measure the quantity of the substance. In the second approach, an arbitrary container is considered as a measure of volume, and the focus is placed on the degree of fullness or emptiness of it. For example, one may speak of a jug of milk, a quarter of a cup of sugar, or half a tank of petrol. Both approaches are measuring "volume", and both fit within Piaget's (1974:vii) discussion of the quantification of continuous quantity.

The second of these approaches is superficially very similar to that taken by the Yolnu in that they too use terms that are generally translated as "full" and "empty" in relation to arbitrary containers. Apart from these features, the similarity disappears. In the quantitative approach, evaluation is made within a continuum between "full" and "empty". The relationship between the substance and the container is one in which the container is used as a unit of measurement to assess the quantity, and the focus is on the quantity.

In the Yolnu (qualitative) approach, a relationship is perceived between the container and the contents, but the evaluation is concerned with the quality of that relationship. That is, it is focussed on whether there is or is not a relationship of "fullness" between the container and the contents. The container does not become a unit of measurement as it would from a quantitative approach and the terms used do not become measurement units.
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In this section I consider first the way in which the basic set of terms is used to assess volume, establishing something like a fundamental set of meanings for them. Secondly, I examine a number of ways in which these terms are used to convey different meanings in different contexts.

The evaluative terms and the relations between them.

Bumbatjun told me the story of two brothers and their uncle who went out in their canoe for turtle and fish. The brothers gathered bait crabs. One of them dhaŋŋŋunaŋal (made full) a billycan with crabs, the other dhaŋŋŋunaŋal (made full) a very small basket. They anchored over a reef and caught many fish. Then they saw a turtle and gave chase but it disappeared. They returned to fishing and dhaŋŋŋunaŋal the canoe with fish. After that the small brother caught a fish that was so big that the other two men had to pull it into the canoe. They again searched for turtles and again speared bDannyu (none). Then they returned home. When they reached the shore they called out to everyone, "Fish for everyone here dhaŋŋ (plenty) but turtle bDannyu (none). They all ate well and everyone was so happy that they told each other funny stories.

In the narrative there are four references to fullness, each of which refers to the same relationship, but in association with containers of different sizes. In each case the usage is consistent. The variations lie, not in relation between container and contents, but in their size. The brothers have two different containers for bait which they "make full". The men then "make full" the canoe with fish, and when they return to those waiting, they report that they have in literal terms a "fullness of fish", meaning, enough to fill everyone in the camp to the point of satiation. The first three
examples refer to the fullness of physical containers, the fourth to the fullness of a container which equates to the ideal of enough to fill every person in the community to capacity. "Fullness", as an evaluation of volume is thus referring, not to the quantity in the container, but to the relationship between the container and its contents. This discussion can thus be considered from either the second of the two quantitative approaches, or the qualitative approach. The difference lies in the interpretation of the word "fullness". In the former it refers to a "quantity of fullness", in the latter to a "relationship of fullness".

A woman collecting dirrpu (waterlily roots) evaluates the quantity in her basket in terms of the fullness or non-fullness of her basket. When she has lurrkun' it will probably be less than half full, and when she has märr lurrkun' it will be between one third and two thirds full. Märr dhanaj will be about the same, though lurrkun' refers to inadequacy or partial fullness and dhanaj to fullness. Once a quantity is evaluated as märr dhanaj, it is considered to be expressing the quality of fullness. Any quantity assessed as smaller than märr dhanaj is considered to be expressing the opposite of fullness, lurrkun' (smallness of quantity) as it would be in English. A basket with mirithirr dhanaj waterlily roots is full to the brim one with mirithirr lurrkun' has almost none. Where there was bäynu (none) turtle meat brought home, the hoped-for volume of meat had not materialised. It could have, if they had speared a turtle, and it certainly was in existence, but its expression had not been achieved. Where there were bäynu (none) waterlily roots in the basket, it was not that they did not exist, but that there was no expression of them in terms of volume in the basket.
These are qualitative evaluations, focussing on the quality of the expression of the attributes of volume. The attributes have not ceased to exist, they just have not been expressed. Figure 2:8 demonstrates the relation between the opposed terms and their modifications, in relation to the fullness or non-fullness of a basket. There is no overt category for this section of the evaluative system.

ii: Uses of volume assessment terms to convey meanings in different contexts

In the everyday situation, the assessment of volume is usually in terms of an ideal of quantity adequate to meet a need rather than a purely abstract consideration. Such an ideal may be the quantity of ochre desired for a particular ceremony. Similarly there may be an ideal of an adequate quantity of meat or fish to feed a particular group of people as was exemplified by a "fullness" of fish in the narrative. In each of these cases, the perceived ideal quantity is spoken of as if there was a container the size of the ideal. The adequacy of a particular quantity is then spoken of in terms of the "fullness" or "inadequacy of fullness" of that ideal quantity.

The social relationships between people involve a complex range of variations in the use of "volume" terms. While they cannot be fully discussed here, I introduce them to give an indication of their potential for influencing meaning. When a request for the supply of materials is answered in terms of the quantity of material available, the meaning communicated by the use of the terms may have nothing to do with any factual assessment of the volume available and a
lot to do with social relations. That is, there may be no relation between the quantity said to be available and the quantity actually available, for the communication has little to do with quantity. For example, if a supply of yellow ochre is requested, an answer may be given which purports to indicate the quantity available, but which actually states the relationship between the expressed need and the willingness to meet it. Thus:

Dhaŋaŋ dhuwal. Indicates a willingness to give all that is required.

Lurrkun' dhuwal. Indicates willingness to give a little.

Bāŋŋu dhuwal. Indicates a total unwillingness to give.

In addition to these straightforward meanings, there is potential for a considerable range of variations to be communicated by the use of the terms. For example, a respondent's generosity may be indicated by claiming to have only a small quantity and then giving an ample supply, or his disrespect for the one making the request may be indicated by the reverse of this, that is, claiming to have a large quantity and then giving little.

The meanings indicated by the use of the terms can be seen to be many and varied. Nevertheless they do not alter the basic meanings of the terms or the structural relations between them. In practice the Yolnu rely on the basic meanings for the effectiveness of their use in such communications. The structure of the relations between the terms used in assessing volume outlined in figure 2:8.
### General Classifications

<table>
<thead>
<tr>
<th>Specific Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>mirithirr dhanan</td>
</tr>
<tr>
<td>dhanan</td>
</tr>
<tr>
<td>nærr dhanan</td>
</tr>
<tr>
<td>nærr lurrkun'</td>
</tr>
<tr>
<td>lurrkun'</td>
</tr>
<tr>
<td>mirithirr lurrkun'</td>
</tr>
</tbody>
</table>

**Figure 2:8. Relations between terms used in the evaluation of volume.**

**SIZE**

Yuwuyuwutj lived at the beginning. He was an exceptional hunter always bringing back abundant fish and turtles, but he ate them all himself. As he ate and ate, his stomach became jutu (stout). Later the other Yolnu decided to retaliate because he did not give food to them. They lit the grass around him as he slept and burned him to death. Now he is dead because he was so greedy.

This little story told to me by Dhëggali and illustrated by Manydjarrri (figure 2:9) clearly indicates the quality of size associated with gandarr, one of the sections of the evaluative system.
concerned with size. Within that overtly labelled section jutu (thick/stout/solid) is opposed to barka (thin/skinny) while gandarr (literally middle or waist), then refers to a domain of size which, covered by the meanings of the oppositions, appears to include solidness. When gandarr is evaluated in relation to an ideal size for humans, as in the story of Yuwuuyuwutj, both the opposed terms have negative connotations as they indicate deviations from the expected normal size.

Figure 2:9. Yuwuuyuwutj who has eaten so much that he has become jutu.

The second set of terms used in evaluating size belong to a covert section of the evaluative system, concerned with general or overall size. Yindi(big/large) and yutjuwala (small/little) are used to evaluate the expressions of this quality, a conception which appears to be close to the English concept of size. Together with their modifications, the two domains form sets of evaluative classifications as shown in figure 2:10.

Size beyond normally expected extremes.

The limits of bigness associated with "very large" and "very thick" can be considered as the normal extremes to be expected for the particular set of items. The items assessed as being at those
extremes are at a point of entering into an expression of the quality which is "beyond the natural". Items at this point can potentially be classified as at the extreme of natural or expected size. Beyond this point of intensity of the quality, new terms are used to classify each of two different types of size. Beyond normal for "very large" is bathala (huge/enormous), and beyond normal for "very thick" is dumurr (exceedingly thick/stout).

To describe an expression of size which is so intense as to be completely beyond normal, and therefore having an aspect of the supernatural about it, new terms are used. Waŋarr, which normally means creative or ancestral spirit, and motj, normally considered to be the name of a particular ancestral being are used in conjunction with yindi (big) or bathala (huge) to produce descriptive phrases. Waŋarr is also used in this way in conjunction with jutu (thick/stout) to indicate a similar beyond-the-natural quality. In the expression:

\[
\text{jutu\text{-}yin\text{-}inan} \quad \text{mirithin\text{-}inan} \quad \text{waŋarryin\text{-}inan},
\]

\[
\text{thick\text{-}become} \quad \text{very\text{-}become} \quad \text{waŋarr\text{-}become},
\]

there is the indication that the thickness/solidness of a particular thing or person has become so abnormally big that it has taken on something of the all-pervasive nature of the creative ancestral spirits. This is exemplified clearly in an incident in the legend of the Wāgilak sisters as it was told to me by Galpagalpa.

"The two sisters made camp at Mirarrmina. They knew something was wrong when all their food ran out of the fire and into the billabong. The python, Wititj, had smelled them, and spoken from inside without them knowing. It was raining and the rain jututhinan waŋarrthinan (became thick/dense/solid, became the quality of waŋarr the ancestor). It was like that because of the words spoken from inside the billabong."
Figure 2:10. Terms used in evaluating two different qualities of size.

The narrative clearly indicates the relation between the ancestral world and the beyond-natural size of the rainstorm. Examples of other variations in the use of such descriptive phrases are as follows:

yindin, motjnha dhuwala waltjannha
large ancestral here/now rainstorm being
i.e. This rainstorm is not a natural one but supernatural.

waŋarrnha yindi nayi
spirit large it
i.e. Its size is supernaturally large.

bathalan waŋarrnha nayi
huge spirit it
i.e. Its hugeness is spiritual.

It appears from this that there is perceived to be a normal range of sizes of things which can be assessed using the basic set of evaluative terms. Items too big to fit within the normal range of sizes are classified then as beyond the normal boundary. Outside this boundary
of "normal" there are then two classifications of size. One of these is "beyond normal size"; the other is "supernatural size" (this latter being linked to the qualities of the creative spirits). These categories indicate not only a qualitative increase in the expression of bigness, but also a qualitative change in the dimension to which the item belongs. Thus it is perceived that the item in question has at least partially, and perhaps totally ceased to exist as physical matter and has entered into a state of existence as spiritual matter. The relation between the normal extreme and the extra-normal evaluations of size are shown in figure 2:11.

Figure 2:11. Relation between terms used to classify normal extreme size and extra-normal extremes of size.

CONCLUSION.

I have shown that the Yolnu evaluate each physical property by means of a pair of opposed categories, and I have argued that these categories are perceived to be in a discontinuous relationship with each other rather than being seen as particular points along a graded continuum of expressions of the property. I have also argued that each of the oppositions is perceived to exist in three forms,
and that each form expresses the one quality differently. I have suggested that for each quality, there are seen to be three forms or expressions. One form can be thought of as a natural expression of its quality, a second which is a supernatural expression of it, and that a third form, that which is a "non-expression" of the quality, is the form taken by its opposition.

The evaluation system itself appears to have two major levels of structure. The first of these focusses on the evaluation of the attributes of one only of the paired qualities in an opposition relationship. The second appears to focus on the attributes which unite the opposed terms.

I have shown that once an item has been classified as expressing one of the opposed qualities in a pair, there are potentially two ways in which subclassification may occur within the "natural" expression of that quality. These are shown in figure 2:12 in relation to the quality "Ql". One of these ways of subclassification has been shown to be based on more precise statements of the type of quality being evaluated. For example, "slippery" and "glossy" were shown to be subclassifications of "smooth". PQlA - c in figure 2:12 represents these more precise definitions of the quality.

The second way in which subclassification was shown to be used was that based on the evaluation of the intensity of the expression of the quality being considered. In this type of subclassification there were shown to be consistently three distinct categories, Ql, MQL, and IQL in figure 2:12. The central one, Ql, is used for an item which represents a sort of average expression of the quality. Of the others, one, MQL, is used to classify an item which shows a partial
or moderate expression of the quality, and the third, IQl, classifies one which is thought to be a very concentrated or intense expression of it.

There is some difficulty in analysis concerning the relationship between the classifications "quality Q" on the general level and "quality Q" on the specific level. In one sense it is the same classification being used on both levels. That is, a classification of "quality Q" identifies an item showing a generalised expression of the quality being evaluated, and it is used this way at both levels of the analysis. However, the "intense" and "moderate" classifications are related to it as subclassifications of its intensity when it is used at a general level, but when it is being used at the specific level, they are contrasted with it. It is because of these two different types of relationships, one at each level of classification, that I have chosen to consider it in both levels.

![Figure 2:12. Relations between terms used in evaluating one of an opposed pair of qualities.](image-url)
The boundary of the "natural expression" of any quality is related to the maximum and minimum limits of the intensity of any expression. Beyond each of these limits there is a point where an item can be classified as outside the natural expression. In figure 2:12, NQl represents the "non-expression" of the quality, a point beyond the boundary of minimal intensity of the quality, and as suggested earlier, it is also the form taken by its opposition. ANQl, almost non-quality, is an expression consistently used by the Yolnu. It conveys the idea that the quality being assessed is of lower intensity than the least that "moderate quality" would be applied to, hence I have placed that classification also outside the boundary of "natural". Outside the other extreme boundary I have shown that there are two evaluations which can be considered as beyond the extreme intensity of the natural expression of the quality. BIQl in the figure represents those superlative classifications such as "weightless", "huge" or "deathly cold", each of which represents an expression of the quality which is "beyond intense quality". The other category, SQl in the figure, is the natural extension of the first. That is, it is so far beyond the the natural as to express a supernatural quality. This classification was shown particularly in relation to evaluations of size, but I consider that the potential for it exists in all the other domains. This appears to be the way in which the Yolnu perceive the boundaries qualitatively. That is there is no quantitative assessment of quality/non-quality, but rather a perception of boundaries established at the limits of expected quality intensity.

The second major level of structure of the evaluative system has its focus not on one of the opposed terms but on the property of matter which is expressed by the oppositions. At this level, the category "non-expression of quality", NQl in figure 2:12, is replaced
by the new form in which the quality is being expressed, that is, its opposite, Q₂ in figure 2:13. This new figure represents the structure of the system at this 2nd level. There is a problem in figure 2:13, because there is generated a false impression by the structure of the figure itself. Q₁ is not the opposite quality to Q₂ as it appears in the figure, but the opposite expression of it. In Q₂ the Yolnu perceive Q₁ as continuing in existence irrespective of its external transformation. This means that each of the oppositions represented by the double-headed arrows in both figures, are oppositions not of kind, but of expression.

Figure 2:13. Structure of the evaluative system as it applies to the property "q".

In this second level of structure each pair of oppositions at one level of classification is subsumed under a single category at a higher level. Mediation occurs between the opposite expressions in such a way as to emphasise the singleness of the quality that they are expressing. In the two figures, the perceived continuum of the quality can be followed along the single lines which join categories across the two levels of classification. It is found in doing this that between any
two terms in opposition at one level there is a term on the other level which forms a mediation between them. Where categories are linked by double lines in the figure, these can be considered as alternative classifications of a single item, that is, an item expressing both qualities equally. Thus an item classified as MQ1 is automatically also expressing the attributes of the classification of MQ2. Similarly, an item classified as BIQ1 is also simultaneously expressing the attributes of IQ1.

In figure 2:13, I have included supernatural qualities at both ends of the quality continuum. This is a hypothetical extension of the structures based on the duplication of the structure shown in figure 2:12, and the logic of the system so far demonstrated. While I have been able to demonstrate this extension in at least one direction, I was not able to discover any documentation which would either support or refute the development of the extension in both directions.

NOTES.

1: gulu is the cotton tree (Bombax ceiba)
2: The canoe (see plate 2:1) was no closer to completion when I left Galiwinku three months later.
3: "Linearity" appears to be a poor translation of "length". However the term "length" comes out of a quantitative evaluative system and it cannot readily be divorced from it, therefore, rather than attach the wrong connotations to djaka I have chosen to translate it by the only slightly less loaded term "linearity".
4: mórr, mèrr gagga and gagga appear to be interchangeable ways of saying "moderately".
5: For more detailed description of the rope-making process see Rudder (1975) and (1980).

6: "long" is also relative to the species of snake or type of rope. e.g. "long" skipping ropes and "long" anchor ropes are different.

7: The meaning of weyin includes both "long" and "tall".

8: During my time in Arnhem Land I managed the craftroom at Yirrkala for eighteen months and later the craftroom at Galiwinku for a further eighteen months.

9: The original story was in the vernacular. For simplicity, I have retained only those vernacular terms necessary for the discussion.

10: The symbols used in figures 2:12 and 2:13 can be considered as abbreviations with the following meanings.

- \( Q \) = the quality expressed
- \( PQ_{a,b,c} \) = precise quality variations "a", "b" and "c".
- \( NQ_l \) = non-expression of \( Q_l \)
- \( SQ_l \) = supernatural expression of \( Q_l \)
- \( MQ_l \) = moderate expression of \( Q_l \)
- \( Q_l \) = general expression of the quality
- \( IQ_l \) = intense expression of \( Q_l \)
- \( ANQ_l \) = almost non-expression of \( Q_l \)
- \( BIQ_l \) = beyond intense expression of \( Q_l \)
- \( Q_2 \) = opposite expression of the quality
CHAPTER 3

CONCEPTS ASSOCIATED WITH THE IDENTIFICATION AND EVALUATION OF GROUPINGS OF DISCRETE ENTITIES.

In introducing the previous chapter I described a contrast between two kinds of physical materials. One of these was said to have a discrete structure, such as trees, implements, and humans. The other kind of material was that without a distinct structure, for example, water or sand. These latter were described as amorphous substances. In quantitative assessments, amorphous substances are evaluated in terms of numerical quantity. I have shown that the Yolnu perceive "volume" as an evaluation related to the "fullness" or "partial fullness" of containers. In this chapter I demonstrate how the Yolnu evaluate groupings of physical things which have a discrete structure, and I examine the structure of the evaluative system used in doing this.

When groupings of items are being evaluated by English speakers, this is normally done in terms of the number of items within the groups. It is common for the qualities of cardinality and ordinality to be considered simultaneously. According to Piaget (1952:viii) his results show that number (or quantification) is organised in successive stages of inclusions of the two aspects, and that the fusion of the two results in "the sequence of whole numbers which are indissociably cardinal and ordinal". Cardinality is the quality of sameness in sets or groups of items. For example, a classification which identifies five eggs, five fingers and five people as a single class, does so on the perception of the quality of "fiveness" displayed in each set. That is, the perception of its cardinality. Cardinality
refers to the related wholeness of any quantity or group of items such that the perception of it focusses on that quality which identifies a particular quantity as distinct from all different ones. It is possible to see relationships between pure cardinal numbers such that one can see that a whole two and a whole three when combined form a new quantity of five. A perception of serial relations is not necessary for this.

In contrast to this, the ordinality of number carries with it the perception of a serial relationship between the number terms. The process of counting is associated with the repetition of a series of such terms in a perceived order. It is the ordinal perception of number which is associated with the gradation of quantity, and it is this which is the foundation of quantitative evaluation.

In this chapter, I examine Yolnu perceptions of groups of items. From a quantitative approach, such groups would be evaluated in terms of their size, or the number of items within them using the process of counting. My argument is, that the Yolnu, when considering any group of items, take a qualitative approach to its evaluation. When this is done, they consider the group as a whole, they see that it is made up of a quantity of items, and then evaluate the quality of that quantity. Each group is seen to have a particular number of members and between the members of a group of a particular size, there is seen to be a particular type of structured relationship. While the quantity of members is recognised (in terms of cardinal number), groups are evaluated according to the type of structured relationship which they are seen to be expressing. The quality of the group is then evaluated in terms of a set of categories, each of which represents a particular structured relationship and hence a particular cardinal number.
The first section of this chapter is concerned with those terms used by the Yolnu to identify the different structural relationship types. That is, the different cardinal number terms. A problem arises if the Yolnu terms are translated by the English number names, for when these are used their reference includes both cardinal and ordinal properties, and hence, because of the quantitative perceptions which are linked to ordinal number, a completely wrong meaning is conveyed. For this reason, as these terms are discussed, I attempt to overcome the problem of description by referring to the Yolnu terms as relationship types. In the second section of the chapter, I examine the concepts of quantity as they are revealed in the forms and uses of pronouns, nouns and verbs. Thirdly I discuss some attempts that have been made to match the Yolnu categories with the English number system. Finally I attempt to demonstrate the structure of the system used in making the different evaluations.

TERMS USED FOR THE IDENTIFICATION OF DISCRETE QUANTITIES.

The Yolnu discriminate between two types of group, using as a basis for distinction the type of preciseness with which the structure of the group can be determined. In one kind it is perceived that the relationship between items can be precisely determined, and the terms used function as precise references to both internal structural relationship and quantity, and therefore as cardinal numbers. The other kind of group is one in which the definition of both structural relationship and quantity within the group is non-precise. I discuss the contrasting sets of terms as "precise" and "non-precise" relationships (or quantities).
Of the terms used to identify the precise kind of group, I consider that a small number can be considered as primary terms, and the remainder as being one or the other of two further types, secondary and derived. I examine the primary terms first, then the secondary and derived ones. Following that I consider how the Yolnu perceive groups of the non-precise kind and the terms used in evaluating groups which contain four or more items.

i: Primary terms.

In discussing the verb gulul'yun (to eat a purely vegetable diet), the definition was given:

Yaka eat bep,PATHA waggany luka.
Not eat meat, vegetable alone/ eat.
food separately

The word waggany, in this context, refers particularly to the qualities of separateness and isolation. These qualities can be seen again in the sentence:

Dharrwa muka walal gan d肥胖thurrnydja, yurr waggany
Many you know they. were sitting (plural), but solitary

yolnu marrtjinany, ustralian bala munhawu.
person went, on that night.

there is emphasised a sharp contrast between the group of people who sat in the camp, and a single person who went off on his own at night, alone. The word waggany, here refers to the isolation of an individual person, a solitariness, in contrast to a relationship.

Marrma', the second of the primary terms, has within its domain of meaning the concept of duality or pairedness. This can be seen in the following example:

Ga dhuwandja dhäwu, nhakun marrma' miyalk bala marrtjin
And this/now story, like duo woman away went

maypalwu, märi'manydji manda nunhi.
shellfish-for, that pair related as they(duo)there/ grandmother - granddaughter, then.
Here the word márrma', assesses the quality of relationship between the women in the group, as well as their quantity with a statement of their pairedness. This relationship is emphasised by the term märi'manydji, which identifies a particular type of pairedness, that is, the reciprocal kin relationship of grandmother - granddaughter pairedness, without losing sight of their discrete individuality. The third person dual pronoun, manda (they), then re-emphasises the quality of pairedness. The conceptualisation of márrma' is thus one of cardinal quality, the particular kind of relationship which exists between items in a pair.

Lurrkun', the last of the primary terms, describes a trio of items. An example of its use is found in the following introduction to a narrative:

nhakun walal lurrkun' marrtjin, bala räkunharaw.  
like they(all) trio went, away to fish-for.

Nhinan walal gan wägagur, nhakun gunhiny, mandany  
Stayed they(all) were place-at, like there/then, they(duo)

wäwa'manydji márrma' ga wanganydja mandaŋ  
pair related duo and single their(duo)  
as brothers
gawal'mirripu.  
mother's brother.

Lurrkun' here is shown to be clearly understood as composed of a pair of separate brothers together with their uncle. The apparent example of addition here, is simply an awareness that less complex relationships exist within more complex ones. Thus, "trio" can be considered as a complete relationship in itself, or it can be considered on the basis of the other relationships of which it is composed.

The meanings of the three primary terms can be summarised as, wängany: isolated, alone, solitary, the state of the individual
person or item prior to the establishment of a relationship
the cardinal number one.

märrma' : duo, clearly perceivable as a set in the form of a pair,
a precise relationship composed of two solitary items. The
cardinal number two.

_lurrkun' : trio, perceivable as a precise relationship and quantity
composed of a pair plus a single item, or of three separate
items, or of three separate items. The cardinal number
three.

Each of the terms refers to the perception of a precise relationship
between the items in a group, and simultaneously each of them focusses
on the uniqueness of that particular relationship as a precisely
perceivable unit. Each of them is thus describing cardinal quality only.3

ii: Secondary and derived terms.

I have named as a secondary term one which the Yolnu identify
lexically, but which, as I will show later, functions in a different
way from the primary terms. Unlike the derived terms it is not
developed from the primary terms. For the present purposes of
discrimination between the secondary term and the primary ones, it is
sufficient to note that it is not used to describe a quantity of other
sets or groups, though the primary ones are.

The word goŋ (a hand), describes a distinct set of items
equivalent in quality and quantity to the set of fingers on a hand.
They are a set, but a set of units which expresses the handness of a
hand, that is, the qualitative relationship of the set of fingers as
a single unit; that peculiar relationship which exists in a set of
five discrete items. An alternative term used instead of goŋ is the
word rulu. Rulu describes a particular arrangement used in heaping turtle eggs for distribution. Each of these heaps takes the shape of a square pyramid. Use of the term will be discussed more fully later, having no real relevance at this point save to note that it is used as an alternative term for gon to identify a discrete group of items.

The derived terms are märma'-märma' (duo and duo) and lurrkun'-lurrkun' (trio and trio). These are, as is obvious from their form, repetitions of the primary terms to cover a duplication of the relationship and a corresponding duplication of the quantity. That is, märma'-märma' describes a pair and a pair, and similarly, lurrkun'-lurrkun' describes a trio and a trio. Neither of these terms can be claimed to be equivalent to a whole number, though each classifies a particular set of items. In the past each has been taken to be identical to an English number as will be discussed later. They are used in a descriptive sense for the perceptual grouping of items into recognisable structured precise relationship patterns which match exact quantities.

After having completed the analysis for this chapter I was discussing it with one of the Yolnu primary school teachers. She indicated a number of different things that we could see two of; two pens, two pages in a book, two trees. "Look at these," she said, pointing to them, "when we think of two, we always think of chuway'manydji (husband and wife pair), or yapa'manydji (older and younger sister) or wäwa'manydji (older and younger brother) or lundu'manydji (a pair of friends)." She was demonstrating that any two items of any kind were thought of in terms of human relationships. Continuing on she said, "When we think of three we think of gändi'mirriju (actual mother) bäpa'mirriju (actual father) ga yothu
manda~ (and child theirs(dual)). When there are four or more we say märr dharrwa (moderately many)". In these comments emphasis is on an identifiably precise relationship perceived as analogous to categories of human relations. The focus is heavily on the quality of the relationships. The term for "moderately many" is discussed below.

iii: Categories of non-precise relationships or quantities.

Groups of items which are too large or vague to be perceived as expressing precise quantity relationships are classified using a different set of terms. The focus of this second set of terms is the quality which can best be described as contradictory to the quality of preciseness, that is, the terms are concerned with groups in which the relationship between items is non-precise, vague, or indistinct in definition, and the quantity of items in the group is not precisely determined. The central term, dharrwa, has been translated in the past from a quantitative perspective as "many" with a focus on the idea of "a large number". However, when it is considered from a qualitative perspective, the meaning emphasised is the quality of non-preciseness of relationship between items in a group, that is, one in which clearly distinguishable relationships have become obscured or blurred. Smaller precise groups can be distinguished within, or extracted from, the large group, but its precise confirmation as a unity is not clearly determined.

There are three terms used in describing these types of relationships. Märr dharrwa, defined in the above quote from the Yolnu teacher as "four or more", refers to a grouping more complex than those identified by precise relationship terms, and where clear relationships are therefore more difficult to identify. Dharrwa can be
used to describe any grouping of things in which there are more items than can be classified by precise relationship terms. It classifies any group of things which carries a generalised expression of the quality, "non-precise relationship" (non-precise quantity). Mirithirr dharrwa then refers to an intensification of that quality as it is expressed in a large group where precise relationships have been completely obscured by the large quantity of items. It classifies the group's quality as a "very much non-precise relationship" and as a "large indeterminate quantity".

As a generalised classification, dharrwa has a wide range of applications in terms of group size, as can be seen in the following examples. In the phrase dharrwa manda weti nhāŋal, 

many they(dual) wallaby saw,

dharrwa refers to a large, vague grouping of the animal "wallaby", where neither specific quantity nor specific relationships between the animals is distinguished. An example of a very small generalised grouping of items classified as dharrwa comes from another hunting story.

Dhuwandja mārrma djanda ga manymak, ga wan'kurra 
Here/now duo goanna and good, and bandicoot

lurrkun', ga dharrwan nhangu ŋunhi ... fivenha nhakun
a trio, and many his there/then..five-become like

maranhuny.

food.

In the context of the story dharrwa refers to "more than a precise relationship" or "plenty", however, as the narrator continues the story, he realises that he can extract a precise relationship from the group and gives it, albeit in English. I will show later that it is a normal Yolnu process (perhaps more so now under the influence of external pressure) to identify precise relationships from within larger groups where this is possible and considered necessary.
Nevertheless the example gives some idea of the lower limits in terms of group size to which it is natural to apply the term dharrwa.

In contrast to classifying a small group, it is common to use the term dharrwa in association with a long list of enumerated items, particularly of such items as might be gathered in a day's food collecting. For example:

Maypal galinyu bumar dharrwa; latjin, rāgudha, nyonda,
Shellfish we gathered many; species, species, species,
(dual exclusive)
niniku .... and so on to the end of the list.
species ..

In each of these examples, while dharrwa has been translated as "many", it is not just a conceptualisation equivalent to "a large number", but includes the notion of indistinct or vague relationship between the items in the group, and of non-preciseness of quantity. The focus in each of these examples is on the vague quality of a large group which makes it difficult to isolate precise relationships, hence the perception of the quality as one of non-precise relationship.

If the secondary and derived terms are temporarily excluded, we find two sets of terms. One set refers to precise groupings where the definition of the individual items is distinct, the members of the set are in an identifiably precise relationship, and the quantity can be classified precisely. The second set of terms refers to groupings in which the quantities represented by the precise terms have been exceeded, the definition of the individual items is blurred, and the relationship between the items is no longer precisely discernible.

When the two sets of terms are compared it can be seen that an analogous relationship exists between them. This is illustrated in
In each set of terms there is one term that can be considered as an "almost" category, a second that refers to a "general" category, and a third which classifies an "intense" expression of the quality being evaluated. In addition to being in an analogous relationship, the two sets of terms can be considered as being in a relationship of transformation, that is, it is possible to see the quality which is being described by the terms (the cardinal quality of quantity/the quality of relationship) as going through a transformation. This occurs as the quality changes through a progression of categories of increased complexity, to the point where it is perceived to transform into a different kind of expression of the the quality. That is, a change is seen to occur in the expression, from a state where relationship can be evaluated in "precise" categories, to a state in which relationship is expressed in, and and must be evaluated in terms of its "non-preciseness".

<table>
<thead>
<tr>
<th>No Relationship</th>
<th>bāŋu</th>
<th>(nothing/none)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precise Relationships</td>
<td>wangany</td>
<td>mārma'</td>
</tr>
<tr>
<td></td>
<td>(solitary)</td>
<td>(pair)</td>
</tr>
<tr>
<td></td>
<td>(part of quality of relationship)</td>
<td>(quality of relationship)</td>
</tr>
<tr>
<td>Non-precise Relationships</td>
<td>mārr dharrwa</td>
<td>dharrwa</td>
</tr>
<tr>
<td></td>
<td>(moderately many)</td>
<td>(many)</td>
</tr>
<tr>
<td></td>
<td>(moderately non-precise relationship or quantity)</td>
<td>(very much non-precise relationship or quantity)</td>
</tr>
</tbody>
</table>

Figure 3:1. Analogous structures of sets of terms used in evaluating relationships between items within groups.
CONCEPTUALISATION OF QUANTITY AS REVEALED IN THE FORMS AND USES OF PRONOUNS, NOUNS AND VERBS.

i: Pronouns.

In the various Yolnu languages and dialects, quantity reference in the pronouns is consistent for each of the different cases. It is therefore not necessary to examine examples from more than one case. As all the Dhuwal and Dhuwala language speaking groups use the same pronouns in the nominative case I have chosen to restrict discussion to that set. This separates into three groups of pronouns in accordance with their reference to quantity (or structured relationship type) as follows:

Those used to refer to a singular subject;

ŋarra = I  nhe = you
ŋayi = he, she, or it,

Those which refer to a duo or pair of individuals;

gal = you and I  manda = they (dual)
galinyu = he or she and I  nhuma = you

Those used to refer to a trio or more;

limurr = you all and I  walal = they (trio or more)
napurr = they all and I  nhuma = you (trio or more)

In the above it will be noticed that the same word, nhuma, is used for you (duo) and for you (trio or more). When it would otherwise be uncertain as to which meaning is relevant, this is clarified by the combined use of nhuma with either manda (they duo) or walal (they trio). Thus manda added to nhuma to produce the phrase nhuma manda (you pair) clarifies reference to duality. Walal added to nhuma produces the phrase nhuma walal (you all/you many) clarifying the reference to trio or more.

Distinction between the precise quantities and non-precise
quantities is not relevant to the use of nhuma in a general sense because it includes all the audience being addressed. The use of double pronouns, in that situation, as outlined above, appears to be as much a consideration of emphasis or style, as of quantity reference. Where it is relevant, distinction is made between "trio" and "more than trio". When the emphasis is on a "trio" specifically, then the quantity term lurrrkun (trio), is used in conjunction with the pronoun. Thus the expressions wala'l lurrrkun (they trio) and nhuma lurrrkun (you trio) are developed. It appears not to be necessary to be specific with the first person terms (limurr and napurr) to specify the "trio" quantity, as the structured relationship is usually known before the personal pronouns are used. When emphasis is placed on a particular grouping as being "more than a trio", this emphasis is conveyed by the use of the word, warrpam (all/the lot) or dharrwa (many), in conjunction with the third group of pronouns listed above.

In the above ways, the pronouns are used to distinguish between 'solo' and 'duo' reference, and between 'duo' and 'more than duo'. The distinction between "trio" and "non-specific quantity" is not displayed lexically in pronouns, but is made specific by the addition to the pronoun of terms which enable contrast to be established between a trio of persons, and all persons.

ii: Nouns.

In the reference to the types of structured relationships or quantities in nouns, there is a basic contrast between those representing non-human items and those representing human or humanised nouns. In the non-human nouns, all reference to the quantity
is carried outside the noun. The noun is then a classification of a class of item, and number is irrelevant to its form, all quantity reference being carried by additional terms used in conjunction with the noun. In human nouns it is often carried by the same methods as for non-human nouns. However there are two differences. First the pronouns are often used in conjunction with the nouns to carry the quantity reference, and secondly, when the reference is to more than three persons, a different form of the noun is often employed to indicate a non-precise quantity. In the discussion of quantity reference in nouns which follows, I have chosen to consider the reference to precise quantity first, and then to follow that with discussion of the non-precise quantity type.

With non-human nouns, precise quantity is communicated by using the terms described earlier which refer to precise quantity groupings. That is the three primary terms for cardinal number. In the non-verbal sentence, *Wēti ŋunhal*, reference is made to a named object, "wallaby", *Wallaby there* but no reference is made to quantity. The use of nouns by the Yolnu in such situations is a classification or an identification of an item, and can be used in reference to either precise or non-precise quantity. With the addition of a precise quantity reference, the above mentioned non-verbal sentence changes form to become:

*Mārma’ wēti ŋunhal.*
*Duo wallaby there.*

There is no change in the noun to indicate structured relationship type (or quantity). Any other precise reference could have been indicated by substituting different precise quantity terms in place of *mārma’* without effecting the noun structure.
With human nouns there are four ways of expressing precise quantity. First it may be through the same use of precise quantity terms as above. For example, Märma' miyalk bala marrtjin maypalwu. 

Duo woman away went shellfish-for.

Again, any of the precise quantity terms could have been used with the noun. Secondly precise quantity may be indicated by making use of a personal pronoun in conjunction with the noun. For example: Nyay yolŋu marrtji wandirri menguma weṭiwa

He/she person went running searching wallaby-for.

In this sentence the personal pronoun functions the same way as the precise quantity term. Thirdly, precise quantity is frequently expressed by using both a personal pronoun and a precise quantity in reference to the one noun. For example:

... märma' manda marrtjin gan miyalk godarr munhawumirr.

duo they duo went continued woman morning early.

Finally there is one set of nouns which expresses an exact duo quantity through precise paired kinship relationship terms. With each of these nouns a particular reciprocal relationship between a pair of kin is referred to. Thus:

wawa'manydji, is a pair of individuals related as an elder and a younger brother,

gawal'manydji, is a pair related as mother’s brother and sister's child,

bapa'manydji, is a pair related as father and child.

In each of these terms the stem (wawa, gawal, bapa), is the term used by the latter (junior) relation, to address the former. For our purposes here the significance lies in the specific reference to a particular precise quantity in the relationship which indicates duality or pairedness.
In the description of non-precise quantity, there is again distinction made between the treatment of non-human and that of human or humanised nouns. Non-human nouns are described by two terms, dharrwa (non-precise quantity) and mala (group). Dharrwa, as we have seen earlier, refers to the non-specific quantity (and relationship) in groups of more than three people or things. The stresses applied to words in speech appear to indicate that mala is an assessment of a group of a particular class of items, with more emphasis on a class of which there is a group, than of the grouping of a particular class. By contrast, dharrwa appears to place the emphasis more on the quantity than on the class it assess. For example, in the phrase, 

nquńhi mąypalnydja mala bórunguŋala, in its narrative

context, there is a contrast being made between the shellfish which were cooked, and the fish which were not. The emphasis is carried by phrase level stress on "shellfish". While there is a non-precise quantity, quantity is only incidental to the contextual focus. By contrast, in the following example, which I have requoted from the earlier section on non-precise quantity terms, the emphasis is reversed.

Maypal ḋalinyu bumar dharrwa; latjin, Ṛgudha,

Shellfish she and I gathered many: species,species,

nyonda, niniku ......,

species, species,......

The emphasis here is on the fact that there is a large group of items with a non-defineable relationship or quantity, than on the fact that these items are shellfish.

One further method was found for communicating non-precise quantity reference with non-human nouns. That was in the terminology associated with dugong, where three distinct terms were discovered.
Galangamirr (*dugong*) is a species name, which, as mentioned above, carries neither relationship nor quantity reference. A second term, djununguyaju refers to a small herd of the animals, a reference to the non-precise quantity in a small group. The third term, djinbaypay, was used to refer to a situation where the dugong were everywhere in what appeared to be unlimited and undefinable quantity. While it is quite probable that other examples of this type of quantity reference exist, in the collection and identification of between 800 and 900 names for natural specimens, (Rudder 1977), I discovered no other examples of a change in vocabulary which could be related to a change in quantity.

With human and humanised nouns, non-precise quantity is communicated in three ways, First, classifications in the form of human nouns have non-precise quantity indicated by either or both of the terms dharrwa (*non-precise quantity*) and mala (*group*) in the same way as has been demonstrated for non-human nouns. Secondly, as was the case with precise quantity human nouns, non-precise quantity may be indicated by the use of the appropriate personal pronoun. For example, walal (*they all*), in association with the "classificatory" noun. Also as was the case with precise quantity, the indication of quantity may involve the use of a pronoun and a quantity term in conjunction with the noun. For example:

\[
\text{Wagganymirr walal yolgu mala gan wakir'yurr gunhal} \\
\text{Once they all persons group stayed for a there/then night or two} \\
\text{... Dharrwa muka walal (yolgu) gan dāpthurmydjja.} \\
\text{Many truly they all(person)continued stayed.}
\]

Again in these two examples there is an emphasis difference indicated by the use of mala (*group*), and dharrwa (*non-precise quantity*). In the former the emphasis is on the people and in the latter, emphasis is on the quantity.
One final quite common way of indicating quantity in human nouns involves a change of form from that taken by the "classificatory" nouns already described. There are three ways in which this is done. The first involves the addition of a suffix. For example, diramula (man) becomes diramuluru (men). The second involves reduplication so that yolgu (person) can become yolgu'ylgu (people), and the third involves a change in vocabulary such that yothu (child) is replaced by djamarrkulja (children). These changes produce what have been described for the language as "plural" nouns (Lowe N.D.Lesson 83). However they do not have quantitative reference but are used to indicate non-precise structured relationship (non-precise quantity), and cannot be used with a pair or a trio of items. As a result, one cannot say lurrukun' yolgu'ylgu (trio, non-precise quantity of persons) as this is a contradiction in terms because lurrukun' (trio) is a reference to precise quantity and yolgu'ylgu (people) refers to non-precise quantity. The boundary of non-precise quantity reference in nouns is clearly set as "more than a trio".

Concepts as expressed in the nouns thus indicate two points concerning quantity. First, with non-human nouns, the general rule appears to be that quantity is not indicated within the noun, but by the use of additional qualifying words. These additional quantity indicators are used to communicate the same limited number of precise quantities as are conveyed by the terms used for precise quantity groupings. Secondly, with both human and non-human nouns additional terms are used to indicate quantity. However the contrast between the precise and non-precise quantity in the human nouns is indicated decisively by the use of the separate non-precise quantity forms of the nouns.
There is, revealed in the verbs, a conceptual distinction between action which is repeated an indeterminate number of times, (multiple action), and action which is repeated a precise number of times (precise action). This distinction is revealed in the use of particular verb forms. For example, barrtjun (to spear) refers to an indeterminate but multiple repetition of the action, while dharpuma (to spear) refers to action repeated a precise number of times. The structure of the multiple action form of the verb is frequently developed by a reduplication of either the stem of the precise action verb, or of its first syllable. Alternatively, as I showed above in relation to the verb "to spear", there may be no similarity between the two forms. For some verbs, there are two different words for the multiple action form. For example, there are two multiple action forms of marrtji (to go, come or walk), one of these is wângama, the other is marrtji'marrtji.

The contrast between the two types of action is clearly demonstrated through the contrasting meanings of the two forms of the verb "to hit", (wutthun and wutthu'wutthun). The former refers to the multiple repetition of the action of hitting, the latter to a precise repetition of the action. For example, in the utterance:

gayi gunhi wutthu'wutthunna dhâ bunbu
he/she there/then hit-hit door house
i.e. He knocked on the door of the house.

there is the notion of multiple hitting or striking (by a single subject on a single object). In contrast to this, in the example:

gayi wutthurruna yothunha
he/she hit child
i.e. He hit the child.

there is the notion of a child being struck a limited and precisely
determinable number of times (with both subject and object being single).

In demonstrating that the quantity reference in verbs is independent of subject or object numbers, I consider first a variety of examples of the use of intransitive verbs, and then further examples of transitive verbs. For the discussion of intransitive verbs I have chosen examples that use the verb "to return", which has both precise action and multiple action forms. In the utterance:

\[
\text{Bala rogiyinan marrtjin nayi,} \\
\text{Away returned went he/she/it,} \\
i.e.\text{He/she returned from here (back to where he/she came from).}
\]

the solitary subject performs a single action. In a second example:

\[
\text{Manda marrtjin rogiyinan, the verb is used in association} \\
\text{They(duo) went returned,}
\]

with the dual pronoun to describe a precise action by a pair of people acting in unison. In a third example:

\[
\text{Napurr marrtjin rulin rogiyirra} \\
\text{We(all) came towards returned,} \\
i.e.\text{We all came back (to where we had come from),}
\]
a precise action is carried out by a group acting in unison. In no case is quantity in the subject reflected in the verb. In each of these examples, the verb used has the precise action form although the subjects range from a single person to a large group. It is when an action is perceived to be repeated a multiple number of separate times that use of the multiple action form of the verb is indicated. For example:

\[
\text{Bala napurr rogi'rogiyirra, uses the multiple action verb} \\
\text{So we(all) returned}
\]
to describe a group of women returning from hunting, not moving as a unit, but scattered through the bush. All of them were moving, but each separately, so that there is the perception of the action occurring in many places at once.
This absence of concord in relationship/quantity reference between the verb and its subject and object continues in transitive verbs, as is exemplified by the two different forms of the verb "to spear". In the utterance:

Wungandja dhu dhuwal walal dharpum,
Dog will this/here/now they(all) spear,
i.e. They will spear dog(s).
Here, the object, "dog", is a general classificatory term which as I have already shown, contains no relationship or quantity reference. The verb is in the precise action form although the subject is non-precise quantity (trio or more). Statements which refer to a single subject spearing a species item are quite common as:

Guya gayi dharpujal.
Fish he speared.
In this sentence the object is a classificatory noun without quantity reference and the verb is the precise action form. A single person can carry out a multiple action in spearing a quantity of fish as for example: Narra gana guya barrtjurruna dharrwa. i.e. I speared many I continued fish speared-speared many. fish.
Alternatively the action may be multiple though both the subject and object are single as when a man spears another man many times.

Dharrwamirri ganya barrtjurruna gurinji yolguy
Many times him speared-speared that-did person-did
i.e. That person speared him many times.
The action is also multiple when both subject and object are multiple

Bunan walal... bala barrtjurruna marrtjin...warrpam'nha bumar.
Arrived they..then speared-speared went...all of them killed.
i.e. They arrived, then went spearing (and) speared them all.

This range of examples gives reasonable indication that the perception of multiple action is not dependent on quantity reference in either subject or object. That is a multiple action verb is not
multiple to agree with other parts of speech, but refers to a separate and distinct quality of the action. It is the action itself which is perceived as repeated an indefinite number of times, and the form of the verb is relevant to that alone. While there sometimes appears to be concord between such reference in the verb and in either or both subject and object, this does not control the verb form.

In an attempt to define the boundaries between the two qualities of action, I made use of the adverbs which qualify the repetition of action more specifically, obtaining the following examples of what were claimed by my informant to be correct sentences. It was emphasised to him that reference was to the spearing of one large fish.

Wappany mirr gayi dhuwali dharpugal guys.  
Single - having he there/then speared fish.  
i.e. He speared the fish once.

Marrma'mirr gayi dhuwali dharpugal guys  
Duo - having he there/then speared fish.  
i.e. He speared the fish twice.

Lurrkun'mirr gayi dhuwali dharpugal guys  
Trio - having he there/then speared fish.  
i.e. He speared the fish three times.

To this point in the increase in quantity the verb takes the precise quantity/repetition form. There appear to be no further adverbs with precise quantity reference. When I made the suggestion that it would be possible to construct them making use of the suffix -mirr (having/possessing), these were rejected by the Yolnu. When I used the precise action form of the verb with the adverb dharrwamirr (many having), the sentence was changed to the multiple action form as below:

Dharrwamirr gayi dhuwali barrtjurruna guys.  
Many-having he there/then speared-speared fish.  
i.e. He speared that fish many times.

It would appear from the above that the boundary between precise action is such that up to, and including a triple action is considered to be
precise action, and that multiple action refers to quadruple or more.

iv: Patterns of quantity reference in Pronouns, Nouns and Verbs.

Certain patterns have emerged during the discussion of quantity concepts in the forms and uses of pronouns, nouns and verbs. I have shown that there is a clear distinction made in the pronouns between "solo" and "duo" reference and between these and "more than dual" reference, these distinctions being contained in the internal structure of the pronouns. However the contrast between "trio" and "more than trio", while perceived, is made clear not by internal structure, but by the use of specific quantity terms in conjunction with the pronoun. The conceptualisation of quantity revealed by the structure of the pronoun system can be visualised as in figure 3:2.

Figure 3:2. Quantity reference in the structure and use of pronouns.

By contrast to the detailed quantity evaluation in pronouns, quantity reference in the structure of nouns is basically restricted to an opposition between precise and non-precise quantity. Though there are a number of dyadic kinship terms, the basic opposition is in certain personal nouns only (see figure 3:3.). Where a greater degree of precision is required, use is then made of precise quantity
terms, or of the pronouns to indicate definite quantity. When this is done, there is again the use of precise terms for single, pair and trio, and the pattern which develops is again as in figure 3:1.

![Figure 3:3. Simple opposition revealed in the noun structures.](image)

In the verb structures there is a simple opposition between precise action and non-precise, multiple action as in figure 3:4.

![Figure 3:4. Simple opposition revealed in the verb structures.](image)

When the modifications are considered, a precise boundary is established between these two domains of meaning as in figure 3:5.

![Figure 3:5. Boundaries of quantity reference as revealed in verbs.](image)
Throughout the structures of pronouns, nouns and verbs, there exists a consistent pattern in the reference to quantity. This demonstrates an opposition between precisely distinguished quantity, and generalised non-precise quantity. When the modifications are taken into consideration, it appears that the boundary in all three cases separates as precise quantities those which can be described as "single", "dual" or "trio", from those which involve a "greater than trio" quantity.

ATTEMPTS TO MATCH YOLNU QUANTITY TERMS TO WESTERN NUMBER SYSTEMS.

i: Interpretation of early attempts to discover a "Yolnu Number System".

Many attempts have been made to match the Yolnu precise quantity terms to the terms used in the Western number systems. For example, Chaseling (1957:53) asserted that,

"If a definite number is used at all, it is usually under five. Fingers are the theoretical basis for counting, and one is 'wonggain'; two 'marrama'; three is two plus one; four is two and two; five is known as a hand 'korng'. Six is hand plus one and so on to ten, which is two hands, 'korng marrama'. When pidgin is in use, the numerals are one to five, and after that it is 'big mob'". (His spelling).

Various non-Aboriginals since Chaseling's time in Arnhem Land (1934-1941), have recorded terms reputed to be numbers from one to twenty. These appear to use almost the same system as recorded by him. However one major variation in terms appears to be that lurrkun' (trio) is now the commonly used term for three.
In displaying the terms in figure 3:7, I have deliberately chosen patterns of dots to match the vernacular terms rather than use the English numerals. In this way the structure of the system is made more visible.

It appears at first glance that these terms do in fact represent a true counting system. However I will attempt to show that this is not so. Even though the system can be stretched slightly to reach as far as "thirty", it has not been generally accepted by the Yolnu. There is every likelihood that it was developed at the instigation of, and perhaps even by non-Aboriginals. I have not heard it used by the Yolnu except where they are working with Europeans in a non-Aboriginal context. For example, it may be used in "counting" small quantities of items in the trade store, in the fishing industry, in the school, or in attempts to translate numbers in various types of translation. Even in such contexts, the Yolnu almost invariably choose to use English numbers (often with the sounds modified to fit Yolnu phonology). It is my assertion that, while this to the western observer appears to be a system of counting, it is for the Yolnu, the development of a number of qualitative classifications for precise quantities and has then little to do with seriation and hence ordinal numbers. 10

An examination of the system as displayed in figure 3:6, leads to four points which support this assertion:

a: The first six items are those earlier discussed as primary, secondary and derived terms, which are perceived as precise sets or relationships, each with its own quantity.

b: The term goq (hand) represents a perception of a different kind from the primary terms. Its use differs in that
<table>
<thead>
<tr>
<th>Symbolised Quantity</th>
<th>Yolnu Term</th>
<th>Literal Translation</th>
<th>Supposed English Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>bàygù</td>
<td>nothing/none</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>*</td>
<td>waggany</td>
<td>solitary/single</td>
<td>1</td>
</tr>
<tr>
<td>**</td>
<td>mërrma'</td>
<td>alone</td>
<td>2</td>
</tr>
<tr>
<td>***</td>
<td>_lurrkùn'</td>
<td>trio</td>
<td>3</td>
</tr>
<tr>
<td>** **</td>
<td>mërrma' mërrma'</td>
<td>duo (and) duo</td>
<td>4</td>
</tr>
<tr>
<td>*****</td>
<td>gog waggany</td>
<td>hand solitary</td>
<td>5</td>
</tr>
<tr>
<td>* * * *</td>
<td>_lurrkùn' _lurrkùn</td>
<td>trio (and) trio</td>
<td>6</td>
</tr>
<tr>
<td>* * * *</td>
<td>gog waggany ga waggany bëythinyara</td>
<td>hand solitary and solitary left over</td>
<td></td>
</tr>
<tr>
<td>*****</td>
<td>gog waggany ga mërrma' bëthyinyara</td>
<td>hand solitary and duo left over</td>
<td>7</td>
</tr>
<tr>
<td>****</td>
<td>gog waggany ga _lurrkùn' bëthyinyara</td>
<td>hand solitary and trio left over</td>
<td>8</td>
</tr>
<tr>
<td>*****</td>
<td>gog waggany ga mërrma' bëthyinyara</td>
<td>hand solitary and duo duo over</td>
<td>9</td>
</tr>
<tr>
<td>*****</td>
<td>gog mërrma'</td>
<td>hand duo</td>
<td>10</td>
</tr>
<tr>
<td>*****</td>
<td>gog mërrma' ga waggany bëthyinyara</td>
<td>hand duo and solitary left over</td>
<td>11</td>
</tr>
<tr>
<td>****</td>
<td>gog mërrma' ga mërrma' bëthyinyara</td>
<td>hand duo and duo left over</td>
<td>12</td>
</tr>
<tr>
<td>****</td>
<td>gog mërrma' ga _lurrkùn' bëthyinyara</td>
<td>hand duo and trio left over</td>
<td>13</td>
</tr>
<tr>
<td>****</td>
<td>gog mërrma' ga mërrma' bëthyinyara</td>
<td>hand duo and duo left over</td>
<td>14</td>
</tr>
<tr>
<td>****</td>
<td>gog _lurrkùn'</td>
<td>hand trio</td>
<td>15</td>
</tr>
<tr>
<td>****</td>
<td>gog _lurrkùn' ga waggany bëthyinyara</td>
<td>hand trio and solitary left over</td>
<td>16</td>
</tr>
<tr>
<td>****</td>
<td>gog mërrma' ga</td>
<td>hand duo and</td>
<td>20</td>
</tr>
</tbody>
</table>

Figure 3:6. System purporting to enable counting from one to twenty.
unlike them it is not used alone but is always qualified by one of them. Any group of items larger than five is broken up into hand-sized units. The gog set then replaces the solitary item as the unit of classification and the precise relationship/quantity terms are then applied to gog as the new unit in place of the solitary items previously classified by them. When this is recognised, terms that were thought to be equivalents of ten, fifteen and twenty in the "Yolnu Counting System" are revealed as being sets of hand-sized units classified by the precise quantity terms.

c: The word bāythinyara is a nominalised form of the verb bāythirri which means "to miss out on something" or "to not be included". Thus each of the terms which use bāythinyara refers to a precise quantity of sets with a precise quantity of solitary items "left over". For example, gog märma, ga lurrkun' bāythinyara is a statement of the perception of "duo sets" with a "trio of solitary items left over", or "which miss out on being included in the set". This appears then not to be a conceptualisation of whole number, but the breaking up of a group of items into combinations of recognisable smaller relationship/quantity sets. That is, an attempt to distinguish precise quantities within a large group which would normally belong in the dharrwa (non-precise quantity) classification.

d: The terms märma' märma' and lurrkun' lurrkun' are reduplications sometimes separated by the word ga (and). The initial term in each of them is not modifying the other, that is, whereas lurrkun' gog is three hands, lurrkun' lurrkun' is not three threes, but three and three. In this way, each term in the reduplication retains its own value as a precise quantity perception and the reduplication functions as a pairing of those values.
The system then has only an apparent equivalence between its terms and English numbers. It is not a counting system, but gives a qualitative assessment based on the conjunction of two separate sets of terms available for classifying quantity. Thus the so called "system" is actually a list of terms ordered in sequence by a recorder. These terms enable a precise qualitative description of quantities which require only a cardinal perception of number. There is no necessity for any ordinal perception to precede its establishment, nor has its establishment generated such a perception.

ii: The distribution of turtle eggs, and an attempt to relate this to number.

A second system exists which the Yolnu use for visualising items in sets. This was originally used in the distribution of a nest of turtle eggs amongst a group of people. In the distribution of these, a "set" of eggs was put together using a precise pattern in which four eggs formed a base, and a fifth was sat on top of them to form a small square pyramid called a rulu (set or group). This produced a distinct set of precise quantity terms somewhat similar to the one I have already discussed which used a "hand" as its basis.
In 1975 a group of some of the most experienced Yolnu school teaching assistants under the leadership of Rose Guywana Gumbula, came together from all the major Yolnu communities for a weekend mathematics conference. The stated purpose was, "We want our children to learn mathematics in our own language so that we can recognise the numbers and shapes etc, and learn language English and our language" (Gumbula 1975a). During the conference an intensive and serious attempt was made to use the turtle egg distribution system as a basis for the development of a number system in the vernacular. (Which probably better than anything else demonstrates the non-acceptable nature of the earlier described system). This new system, based on the patterned layout of the turtle eggs, resulted in what appeared to be the achievement of a means of counting up to twenty objects, though it was not capable of generating terms to match quantities of more than twenty items (see figure 3:8).

In developing this system, the word **rulu** (*set or group*) was used in preference to the word **bukumirri** (*head-possessing*)
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<tr>
<td>solitary</td>
<td>duo left</td>
<td>over</td>
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Figure 3:8. Patterns and terminology used in a Yolnu attempt to develop a counting system.

to describe the sets of five items until the number twenty was reached. At that point it apparently became better reasoning from a Yolnu perspective to class "twenty" as shown in figure 3:8, than to call it bukumiriw rulu. Similarly it appears poor
reasoning to have rulu rulu (set set or set of sets), and it would seem that the two terms rulu and bukumiriw are classificatory nouns which describe particular relationships/quantities, but which are not thought of as belonging to the same category of quantity evaluation terms as the three primary ones, hence they do not fit into the category of words which can modify others.

There are two basic differences between this new system and the previously described one. First, marrma' marrma' (duo duo) has been replaced by bukumiriw (headless). With this change there has been a conceptual shift. Four items were earlier seen as the duplication of a set of two solitary items. Perception of the same quantity is now seen as a distinct set which, instead of being related to solitary items, is related to the rulu (set or group) as an almost complete group. Thus four items, a problem at the boundary of the two systems of classification, (i.e. by sets or by units), is treated in the first system as being "more than" the basic set of primary precise quantity units, and in the second system as "almost" or "not quite" one of the precise quantity sets. The second difference between this system and the earlier one is that reduplication as a means of describing a larger quantity has been dispensed with.

The system developed at the Yolnu conference, like the earlier system, is based on a shift in the classificatory unit by which items are being assessed. In this way the perception of precise quantity is transferred from a quantity of solitary items to a quantity of sets. This, while having the appearance of developing a set of ordinal numbers, has in fact developed an extended set of cardinal numbers. The relationship between
the conceptual structures associated with the perception of precise quantities of items and the perception of precise quantity of sets, one of reclassification is an analogous one rather than a contrastive one as can be seen in figure 3:9.

Figure 3:9. Analogous structures seen in qualitative perception of quantity of solitary items and of solitary sets.

iii: Summary of discussion of attempts to match Yolnu concepts to English numbers.

In the preceding discussion I have shown that the Yolnu systems developed do not require a perception of ordinal number. I have shown also that the two systems are composed of lists of classificatory terms which have been developed for the identification of precise quantities. In the second system, one which is known to be Yolnu in origin, I have shown that an analogous relationship exists between the terms used to classify precise quantity with individual items and terms used to classify precise quantity as sets.

The use of modification was shown earlier in relation to
the classification of dharrwa (non-precise quantity) using mārr (moderately) and mirithirr (very much). The classification of rulu (set or group) in the second system has a distinct modification (missing in the first system). The absence of the "head" item in the set provides the modified form bukumiriw (headless). The addition of extra items to produce a "set with x left over", produces a classification like "very much a set", the equivalent of an intensification. Each of the different "left over" quantities can be argued to fit this same category of intensification, so that there can be argued to be three categories at this set level of classification. At the same time each of the "left over" quantities are classified in accordance with the perception of their precise quantity.

There are then, in the supposed counting systems, three distinct levels of classification being used in conjunction. In the first, the individual items are classified according to a perception of them as a precise quantity of units, In the second, sets of items are classified according to a perception of them as a precise quantity of sets. In the third, the classification of the set and its modifications are used.

CONCLUSIONS.

In the preceding discussion I have argued that what may appear to be numerical quantity is evaluated on the basis of qualitative structured relationship which is limited to the cardinal quality of number. They are therefore not counting systems either, but systems for classifying larger groups in terms of the relationships.
identified within them. I have argued that while these systems allow
the identification of larger precise groupings, they do not require
the perception of a larger relationship/quantity term than "trio",
with the possible exception of the "hand set".

Following Levi-Straussian logic (1972), it is possible to
formulate two different arguments for the limitation of the
primary numbers to the equivalents of 1, 2 and 3. The first of
these would suggest that the Yolnu had no need for numbers
beyond this quantity, either for practical or intellectual purposes.
The second is that the quantities one, two and three are conceptually
and that four is not, therefore the cut-off point would occur at the
limit of conceptual importance. The relevance of both these
arguments is obvious in the light of discussion in the second chapter
and will become more clearly supported by the evidence in the
following chapters.

Psychology literature suggests another feasible
reason for the boundary which occurs between the quantities 3
and 4, and for the contrasting styles of perception of quantity.
Taves (1941) claimed that there are two mechanisms for the
discrimination of visual numerosness. A small quantity of things
from 1 to 7 or 8, are discriminated in one way and larger numbers
are discriminated in another way. Chi and Klahr (1975:438) carried
his experimentation further arguing that "In both adults and young
children, there appear to be (at least) two distinct
quantification processes. One process, operating almost errorlessly
on the range below n=4 is about 5 or 6 times as rapid as the other,
which operates on the range above n=3". Klahr(1973) had
suggested that the lower numbers were recognised by the process
of subitizing (instantaneous visual recognition) and that the second group of numbers was probably recognised by a process of subitizing sub-sets of dots while computing a running sum. This latter process he suggests, is what is conventionally called counting. It appears to me that the results of this experimentation form a significant correlation with my own argument that the Yolnu recognition of quantities is not achieved by counting. Significantly also the boundary between subitizable and non-subitizable quantities is in the same location as the boundary perceived by the Yolnu between precise and non-precise quantities. While it is interesting to note this harmony, I do not consider the primary basis for the limitation of precise relationships to the trio to be its subitizable size. In later sections of this thesis I will argue for a harmony between these classifications and metaphysical perceptions.

In the preceding chapter I argued that the Yolnu perceive a re-classification beyond the boundary of a category as being a classification into a new dimension of existence. I have shown that a similar transformation occurs between the sets of terms used for classifying precise quantity relationships and those used for classifying non-precise quantity relationships. I am now suggesting that the Yolnu use of analogous structures in the attempt to evolve a counting system (figure 3:9) follows the same structural pattern.

In figure 3:10 I have attempted to illustrate the Yolnu perception of a change in the state of existence, by making use of a spiral diagram in which the outer circle contains the transformation of the inner one. I have drawn it as a spiral rather than as two concentric circles, as this better conveys the idea of a link between the two dimensions of
existence. I also gives a better illustration of the perception that there is a continuation of the same quality in a new state of existence. Thus that which is a solitary item transforms to become a solitary "set". At this point it does not matter whether the "set" is called a "hand" or a "group of turtle eggs", the quality is the same in both states of existence, that is, "solitary". It is the change in the state of existence which is being classified, a change from existence as an item to existence as a set. In the same way "two items" is transformed into "two sets" (ten), and "three items" is transformed into "three sets" (fifteen).

Figure 3: Relation between quantity perceived as solitary items and quantity perceived in sets.

One other feature of significance in the figure is the transformation of what I have marked as "X" which, in the figure, takes the place of the word bāyu. This is normally given the literal translation of "nothing/none". In this case it refers to the absence of any established relationship, that is the non-expression of the quality "quantity", rather than being a reference to the non-existence of quantity. There is, associated with "X", the perception of
a condition of "pre-existent" or "other existent" state. In figure 3:11 the transformation of "X", has been indicated as "X!", denoting the transformation of the same quality to a new state. The position of "X!" in relation to the two dimensions of existence is an intermediate one, beyond the first state and "pre-existent" of the new state. This perhaps helps to explain the ambivalence with which it has been handled in the previously discussed systems. Thus the term märma' märma' (duo duo) focused on it as beyond the first state of precise quantity, while bukumiriw (headless) focussed on the pre-existence of the new state, that of relationship as "set". The transformation of "X!" to "X!!" marks the "beyond the 'set'" state. It indicates the end of the state of existence of "quantity" as relationships/quantities of "sets" and the "pre-existence" of a new state.

At the Yolnu teachers' conference it appeared that it was not possible for them to develop further terms using the same structure. It seemed also that they were unable to form another transformation in numerical terms. If the same logic were pursued, it would be possible to make transformations in a variety of different ways. For example, to larger precise sets or to non-precise categories. In terms of the logic revealed in the previous chapter, further investigation may find that when groups are perceived to transform beyond the presently established sizes, they could be seen as transforming from a "natural" category of quantity to a supernatural or spiritual one. Whether such was found to be so or not, the potential for such a transformation is available within the structures.
NOTES

1: Sayers, B.J. (1982:187) suggests that, "the Aboriginal not only doesn't see any value in precise counting, but, particularly in a more traditional Aboriginal environment, he doesn't understand the number concept basic to counting".

2: I have distinguished as "primary" those terms which first, refer to a precise grouping of discrete units and which secondly can be used to classify sets of other differently sized groups. "Secondary" terms are then those which refer to precise quantity groups but which are not used to categorise other groups. "Derived" terms are those developed through the alteration or redescription of primary terms.

3: Hallpike, C.R. (1979:242) is clearly searching for the notion of "number" terms being not quantitatively but qualitatively related to each other when he suggests that, "it is not at all clear that primitive enumeration, because it is so closely tied to action and graphic configurations, conceives the natural number series as the product of the successive iteration of the unit 'one', rather than seeing each number as a distinct configuration in its own right."

4: Rulu is translated by Jennison (1927) as "sheaf". He notes that items can be tied up into a rulu. In the contexts where I have encountered its use, it has been applied consistently to a square pyramid of turtle eggs.

5: This teacher had been one of those keenly involved in the maths conference discussed on pages 83 to 86.

6: In the narration of past events it is common to enumerate the individuals and their relationships at an early stage in the story.
7: By "human" nouns, I mean those nouns referring specifically to people. Humanised nouns refer to those items which are treated as having a human personality but which are named as non-human. Such items occur frequently in myths where distinction between animals and humans is blurred. Humanised nouns are used in conjunction with pronouns, but I have not discovered any multiple quantity forms of them.

8: In subsequent checking I found that these multiple quantity terms for dugong were not known by other Yolnu than the small group of fishermen who told them to me. They appear to be specialist vocabulary, and I have included them only for their value in indicating further areas for investigation.

9: Chaseling appears to have obtained the phrase "two plus one" by translating the Yolnu words märma' ga wangany (duo and single), giving in doing so the impression of counting when in fact it represents the separate classifications of the elements in the group.

10: There is always the possibility that such a system or the following one (see also note 13) could develop into a genuine ordinal system, but it would require a radical change from the qualitative to a quantitative perception of evaluation.

11: See note 4 above.

12: It would appear that whenever the term bukimiriw (headless) is used, its implied meaning is bukimiriw rulu meaning "a set without a head". To use that term as a translation of "twenty" would be completely illogical in qualitative thought structures.

13: In taking this approach, I am in conflict with Harris, J. (1982), not in his claim that Aboriginal people have numbers, but in his assumption that these mean the same as the numbers in our Western
quantitative systems. According to Harris (p169-173) quoting Sobek (1981), Galarrwuy Yunupingu has produced a number system which enables the counting of numbers up to 1250. However, Galarrwuy's ingenious effort is based on the use of quantitative thinking, and whether his system gains any widespread acceptance remains to be seen.

14: Levi-Strauss (1966:8) argues in fact that classifications are extended beyond the essential to meet intellectual requirements rather than, or instead of, satisfying needs. Assuming this to be true for the Yolnu, the limitation to such small numbers would appear to indicate is a relatively irrelevant concern, but that there is real relevance to them in establishing the limits of precise quantity at the number three.

15: It is possible to follow the same logic in mathematical terms. If this is done there can be a second transformation from a "set of five" to a "set of twenty-one" (one unit greater than the present limit), "ten" is then transformed to "forty-two" and "fifteen" to "sixty-three".
Considerable attention has been given in Anthropological literature to the number of "basic color terms" used in different cultures, to the status of those colour terms and to the concepts involved in the colour naming process. I consider some of these issues, but from a different perspective. For my purposes, the number of colours named, and the focal points of those colours are of secondary interest only. My concern is with the actual process by which culturally relevant colours are named, the structure of the evaluative system used in that process, and the perceived relationships between colours or colour classifications. That is, I am interested in what the Yolnu do conceptually with the colours that are apprehended with the physical senses.

In the approach to this subject I used a variety of materials. Three different colour charts with different arrangements of colour chips were discussed with different Yolnu, (one of these being the chart published by Berlin and Kay (1969) - henceforth B & K). In addition to these I used as a basis for discussion, a numbered set of pigment samples obtained from a variety of sources in Arnhem Land, together with photographs of bark paintings in various stages of production. Finally the use of colour terms in everyday situations was recorded wherever this was noted, though in practice, colour is rarely a topic of everyday conversations.
I have found it necessary to consider at some length a number of aspects of colour conceptualisation. In particular, the relation between concepts associated with colour and those concerned with the colour pigments. In the following discussion I demonstrate that the Yolnu do in fact apprehend with the physical senses the full range of colour across the colour continuum of the spectrum, and show how this is broken into bounded entities by the classificatory system.

I begin by discussing a number of ways in which colour terms are met with in conversational contexts, albeit ones which I partially contrived, and a general consideration of the Yolnu domain "colour/design".

i: Terminology associated with colour and design.

A single term is used to classify the section of the evaluative system concerned with colour. This is the word miny'tji which means both colour and design. In different contexts the focus tends to be more on one of these attributes than on the other. It appears nevertheless that neither is ever completely absent and that whichever attribute is emphasised, the meaning includes both.

In a corner of the Galiwinku craft room there were a number of buckets of pigments. These had been collected for the craftsmen to use in producing artifacts. In the buckets there were cakes of clay, crushed white clay and also pieces of red and yellow ochres. I asked one of the painters what was in the buckets. "Gamunungu miny'tjiw," he replied and then proceeded to separately identify various pieces
from the buckets. One was miku, a piece of local haematite-rich sandstone. Later he declared that, that had really been ratjpa (haematite), and showing me a piece of red ochre from the neighbouring centre of Yirrkala declared, "Dhuwal yuwalk miku," For him the second true red ochre. sample was real and the first one only a substitute. The next sample shown was a different piece of reddish ochre. This so he said was also miku but not real miku either, rather it was gangul (yellow ochre) which had been roasted in the fire until it changed colour to red. A bucket of white pipe clay was gamununggu, though he had earlier used that word with a wider reference to cover all the samples. This gamununggu he said was also watharr (white). I queried this, pointing to a large cake of pinkish clay amongst the white, but it was also gamununggu. Pushing this identification I asked him "Yow?" (Is it really?/Oh Yes?) as if doubting his answer. He broke the cake, and laughing at my ignorance displayed a streaky mixture of white and red clay. "See," he said, pointing to the white streaks. It was obvious that I was being shown that I didn't know everything, and that there was white on the inside even though not visible on the outside. He then explained that while it was gamununggu, it was not a first choice sample to use on the fine bark paintings, though it would be completely satisfactory for smearing over the body for general ceremonial uses. Later to complete my education, he showed me a piece of black stone which he declared to be mol (black). It too had come from Yirrkala, and it seemed that Yirrkala pigments were the only real ones. For him, a man more oriented towards Yirrkala than to Galiwinku, others were only substitutes.

This painter saw the colour terms as the names for the solid colours, that is, the ochres used in painting the designs on bark
paintings. Each colour was, for him, best exemplified by the ochres from particular sites with which he was associated. The meaning of the word miny'tji (design and colour) in that context focussed on design, with colour more a secondary attribute used in the creation of design

The leader of one of the local music groups showed me that miny'tji can be used in contexts where the pigments are not being considered and the only colours used are black and white. He showed me a copy of the cassette box label that his group had had printed, displaying the group's name and photograph, and asked me if I liked the miny'tji. When I asked the meaning of that word, he explained that he was talking about the photograph but that it also meant the writing and the overall design. His focus was not on colour, although the colours black and white were involved in the design being displayed.

On a different occasion I was sitting in the camp with one of the families discussing the work I was doing. I mentioned that I was learning the ways that Yolnu thought about miny'tji. One of the senior women immediately chose to show me exactly what the word meant by dramatising the thoughts and actions she would use in choosing a new dress in the local general store. As she did this she took advantage of the clothing being worn by members of the group sitting around us, examining a shirt here or a skirt there as if she was talking to herself about dresses in the store.

Nhä ɲarra dhu miny'tjiwa djälthirri girri'wa?
What I will colour-for desire clothes-for?

Mak mol? Gangulmirri ɲarra dhu mərrama, ga wiripu ɲarra
Maybe black Yellow-having I will get, and different I
Plate 4:1. Examining the colour chart published by Berlin and Kay.

Note the pattern of white lines separating the colour chips.

Plate 4:2. Examining the I.S.C.C. - N.B.S. Color Name Charts.
She explained that she was considering colour printed dresses and describing them to herself by the colour which in some way stood out. One dress had sections of black, another emphasised yellow while the third had white sections contrasting with a basically coloured dress. In this choosing of dresses, the focus of meaning is almost the reverse of that used by the musician and the craftworker. Colour has become the most significant attribute of miny'tji without design losing all relevance. The "yellow-having" or "white-having" refer to the dress which has that colour. "Black" refers to colour rather than to design.

The day following the above discussion I returned to the family camp to visit the husband. He had been involved in the discussion of colours and had listed the names he used at that time. On this second visit I was intent on recording his responses to the colour chips on the B & K colour chart. I showed the chart to him, pointed to it and asked, "Nhā dhuwal miny'tji mala?" His instant response to my poorly worded question was, Yirritja, giving the name of one of the two moieties. After some discussion of this response, he finally communicated to me that he had focussed on the white spaces between the colour chips. Looking diagonally across the chart he had seen the white spaces as white lines outlining a pattern of diamond shapes. As there are a large number of traditional designs used by the Yirritja moiety members which are based on such diamond patterns, (see plate 4:1.), he had thought in those terms. After a round-about discussion of other things, during which time he showed me that different colours were relevant to different designs, he then proceeded to identify on the chart the colours he had named for me.
on the previous day. Later in searching for an understanding of these responses, I discussed them with another man. The problem, he explained, lay in my poorly worded question. The word, mala, with its two distinct meanings (group of things, and clan group) would have caused confusion. Also it might have been thought that I had used the possessive form malaw with its almost silent final letter. While still confusing it could then sound as if I was trying to translate the English question, "What group's design is this?". As I had for a number of years regularly discussed traditional designs with the first man, this would have been a natural choice for him to make.

The situation in which I have found the focus of miny'tji to be most consistently on colour is in the discussion and description of natural species. Colour terms are then frequently used to discriminate between species which are otherwise almost identical. Two yams are distinguished by colour alone, different parrots have certain colours on different parts of their bodies and two different Eucalypts have, among other features, different coloured flowers. Such differentiations using colour terms as a basis are frequently used under the category, miny'tji.

Since traditional design is of great significance to the Yolnu it follows that the most general use of miny'tji focusses on design. However even when it is used to refer to the pattern of cross-hatched infill in traditional designs, the colour of the cross-hatching is relevant to the meaning. It can be seen in the above examples that while miny'tji refers to pigment, to colour and to design its meaning can be focussed almost completely on any one of them, the particular emphasis being conveyed by the context of its use.
Each pigment used by the Yolnu comes from a specific named location. Each has its own special significance in relation to the site and to the creative ancestor believed to have distributed ownership of the site (see table 4:1). I was also told that each of these pigments also has a secret name or set of names that refers to the pigment from that site only. The revelation of these names is restricted, generally being told only at the men's secret ceremonial grounds and they were not told to me.

The pigments from different sites vary considerably in both colour and texture. For example, yellow pigments may occur as a soft powdery clay, as a soft stone with sedimentary layers visible in it as a hard stone, or as in one sample that I was given, as a brittle hard stone composed of large, almost crystal-like sections. The place of origin of different pigments can often be identified by Yolnu on the basis of such features.

Though colour is a significant feature, the naming of pigments involves considerably more than their colour. A yellow pigment is not just a yellow pigment, but a particular transformation of a significant ancestral substance, associated with the activities of a known creative ancestor at a particular location. Thus pigments are not simply a source of solid colour, but the tangible presence of transformation of the ancestral world, and as such are considered to have both a physical and a metaphysical substance. One yellow pigment may be named as Dhondjipuy buthalak (*Dhondji*-belonging-to yellow), another may be called either Mirrnatjawuy buthalak (*Mirrnatja*-belonging-to yellow) or dhalwatpu djukurr (*Green Turtle fat*), thus giving a precise identification while avoiding the use of secret names.
<table>
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<tr>
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<th>Mythological Association</th>
<th>Pigment Colour</th>
<th>Transformation of</th>
<th>Moiety</th>
<th>Owned by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban'tula (Elcho Island)</td>
<td>mana (shark)</td>
<td>yellow</td>
<td>shark's flesh</td>
<td>Dhuwa</td>
<td>Liya-dhalinymirr and Buyu-djarrakmirr</td>
</tr>
<tr>
<td></td>
<td></td>
<td>red</td>
<td>shark's blood</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>white</td>
<td>shark's fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(djukurr)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warrgga (Elcho Island)</td>
<td>yarrpany (honey bee)</td>
<td>pale yellow</td>
<td>djukurr (fat of hive)</td>
<td>Dhuwa</td>
<td>Murrugun (bapurr) and Gumbirri (mala)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dark yellow</td>
<td>mapu (pollen balls)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirryatja</td>
<td>dhalwatpu (green turtle)</td>
<td>yellow</td>
<td>djana (fat of turtle)</td>
<td>Dhuwa</td>
<td>Marragathumirr and Liya-dhalinymirr</td>
</tr>
<tr>
<td>Miwatj</td>
<td>baru (saltwater crocodile)</td>
<td>yellow</td>
<td>djana (fat of crocodile)</td>
<td>Yirritja</td>
<td>Gumatj</td>
</tr>
<tr>
<td>Dhondjji</td>
<td>Ñaw (freshwater crocodile)</td>
<td>yellow</td>
<td>fat of crocodile</td>
<td>Yirritja</td>
<td>Bidigar (bapurr)</td>
</tr>
<tr>
<td>Balawalagur (Howard Is)</td>
<td>galangamirr (dugong)</td>
<td>bright red after roasting</td>
<td>feaces of dugong &amp; blood of dugong</td>
<td>Yirritja, Mandjikay (bapurr)</td>
<td></td>
</tr>
<tr>
<td>Yinitjuwa</td>
<td>manjan (cloud)</td>
<td>black</td>
<td>cloud</td>
<td>Yirritja</td>
<td>Maymurru (bapurr)</td>
</tr>
<tr>
<td>Yirrkala</td>
<td>warrara (red sunset clouds)</td>
<td>red</td>
<td>sunshine at sunset (?)</td>
<td>Dhuwa</td>
<td>Mārika (bapurr)</td>
</tr>
<tr>
<td>Galiwinku</td>
<td>wāran (sugar glider)</td>
<td>red-purple</td>
<td>not revealed.</td>
<td>Dhuwa</td>
<td>Gumbirri (mala)</td>
</tr>
</tbody>
</table>

Table 4:1. Location, Associations and Ownership of some pigments.
Beyond this use of unchanging locality-specific and secret names, there is considerable variation in the naming process. I used some twenty plus different pigment samples as a basis for discussion of and identification of the pigments and their sites. In these discussions it was common for a single term to be used as a general name for all the pigments of one basic colour range. Thus all yellow pigments could be named gangul or buthalak and all reds could be named miku, though there was usually a distinction made between the purple-red haematite and other reds. Some people would refer to the haematite as miku (red pigment), then alter their identification to ratjpa (haematite pigment), the common name for the ore from Elcho Island. An example of this is shown in the earlier described discussion of pigments with the craftworker. Another man suggested as he corrected himself that ratjpa could not be called miku, as they belonged to different moieties. It is possible that he was referring to the very bright red pigment from neighbouring Howard Island, when thinking of miku as the opposite moiety but there are pigments from both moieties known by that name. It appears that a number of different groups call their own red pigment miku, each declaring at least in private, that theirs is the true one. It seems also that there is general agreement concerning pigments that ratjpa (haematite) is distinct from miku.

Black pigments were given a variety of names. Mol and gurrjan are terms which appear to mean "black" in most contexts. Djunapal is a non-secret name for the black pigment stone, while gurrngitj and lirrgi, common names for charcoal,(also used as a pigment), are often used as names for the black stone. Apart from the name for the black stone, any of the other terms can be applied to any of the black pigments.
The white pigments had a similar variety of names. They were often simply called *watharr*, which appears to refer specifically to their white colour. Galkarra and *gapan* are names applied as general terms for any white pigment, though by far the commonest term used at Galiwinku was the word *gamunungu*. This word has an extremely diverse usage again varying in meaning according to context. The discussion with the craftworker (see page 91) provides one example of this diversity. In that discussion *gamunungu* refers first to the full range of paint pigments, as if it meant "paints". It was then used to refer to cakes of whitish clay as a specific pigment and then finally to speak of the streaks of white within a conglomerate of red and white. In the dramatisation of shopping in the store (see page 93), *gamunungu* is referring specifically to the colour white. On a different occasion I overheard a discussion between a Yolnu worker engaged in house painting and one of the non-Aboriginal staff;

Way galikali banyuthinan *gamunungu*!
*Hey subsection nothing* *gamunungu!*
*term become*
Lit: *Hey ..... (I've) run out of gamunungu!*

She asked: *Nhā gamunungu?*
*What gamunungu?*
Lit: *What is gamunungu?*

He: *Paint ..... white undercoat. (spoken in English)*

Here the aspects of being paint, and being white are both important. Another man called it the *bāpurru*, or collective name, which includes all white paints, both Yolnu and Western in origin.

Where the range of pigments was discussed in relation to traditional designs there appeared to be five general pigments. These were red, yellow, black, white and haematite. Whether the first four of these were collective terms for pigments of a single colour range or whether they are colour names in terms of origin is a problem I will discuss in the next section. There seems to be a general
consensus that ratjpa is a pigment, but there was confusion as to whether it was a colour or not.

iii: The naming of primary colours.

When the Yolnu are confronted with a wide spectrum of colours such as those displayed on a colour chart, they are clearly able to discriminate between very fine colour differences. An examination of the way they name the colours that they distinguish, indicates that they perceive certain areas of colour as centres of focus and adjacent ones as being related to these. These foci are what I have chosen to call "primary colours". The colours seen as related to these or as modifications of them I have called "secondary colours". This approach differs considerably from that used by B & K and those who have continued the discussion of "basic color terms",\(^7\) but it is more useful for the directions of structural analysis that I have chosen to take. This is because it enables a comprehensive discussion of the perceptions involved in the naming and evaluating processes and an analysis of the structures used in those perceptions.

In relation to the colours named in English, there are five colours consistently discriminated by most Yolnu; black, white, red, yellow and blue. However, in the areas related to red there are a number of other colour foci which are identified separately and which do not relate to English "basic color terms" at all. The number of these separately named foci varies from Yolnu to Yolnu and I will return to the discussion of those variations later. At this point I consider the various primary (or focal) colours named and the process by which they are named.
There was completely universal agreement with regard to the naming of the first four colours, the first two of these being names for colours only. The name for black as a colour is \textit{mol} and its use in reference to charcoal or to manganese ore is to their blackness only, each of them having more precise names. \textit{Watharr} (white), is used to describe the white of white clay, of paper, of feathers and other items referring consistently to the colour rather than any other attribute.

In the examples of the use of colour terms on pages 97 - 101, whiteness was described several times by the term \textit{gamunungu}. This term's use was discussed earlier in relation to pigments. It is used quite commonly as a classification of white on colour charts and in other situation, frequently enough to consider one of its meanings to be "white". However, it has other meanings whereas \textit{watharr} does not and as this latter term is the most commonly agreed to colour name for white I consider it to be the primary term and other words to be supplementary to it.

\textbf{Miku (red) and buthalak or gangul (yellow)} are names applied to both pigments and colours. They are used as common names for all pigments of the appropriate colour, irrespective of the site of origin. The names are also applied in a general way to the red and yellow areas of the colour spectrum, their domains being modified in relation to the number of colours named by a particular person. There is however fairly general agreement that the focal point of \textit{miku} on the ISCC Color Name Charts is on "vivid red", and "strong red" while \textit{buthalak} occupies the "brilliant", "strong", and "vivid" areas of four colours on the charts, "orange", "orange yellow", "yellow" and "greenish yellow".

The fifth of the generally used colour names is \textit{mulkuminy} (with its alternative pronunciation of \textit{milkuminy}) This was identified as
being best represented by the "brilliant", "strong", "vivid" and "light" areas of the "blue" and "greenish blue" colour charts. This term is also the name for the gall bladder, the contents of which is a bluish green in both animals and marine species. This organ is significant in that its contents are painted onto wounds such as those inflicted by stingray spines to both relieve the pain, and to heal the wound. One informant, speaking of the use of this name said, "We use mulkuminy as a colour name but it's not only a colour. We use it after it came from the mulkuminy inside fish or wallaby or turtle. We could just as easily say "sea" or "sky". Another man, while indicating the focus of mulkuminy on the colour chart, referred to it as the colour of deep water, contrasting it with green which he said was the colour of water over reefs. A third person said that he always called blue gäarak, which is the name given to blue sky clear of clouds. With these sorts of comments being made, and an awareness that the previously described colour terms were pigment names, I became dubious as to the authenticity of mulkuminy as a colour name of any antiquity. However it is known to have been in use at Elcho twenty years before the present settlement was commenced, as Jennison (1927) recorded its use during his time there (1921-23).

The name of the haematite ore, ratjpa, is also used as a name for certain colours quite distinct from those classified as miku. Generally these match with the "grey", "dark" and "very deep" areas of both "red purple" and "purplish red" on the charts. There appears to be some confusion among the Yolnu over the classificatory relationship between this colour and miku and a few people appear to treat it almost as a subclass of miku. There is however a strong possibility that English colour classes have influenced this. The English colour "red" is regularly translated as miku and I have heard ratjpa described in
English as a "red colour". It would seem that this could easily cause confusion in cross-cultural communications about meanings. The Yolnu have an awareness of this difficulty as shown by the comment mentioned earlier (page 104) where one of the men attempted to justify discrimination between the two colours on the basis of moiety ownership.

The other most common colour identified is brown. Labelled gundirr it can range in colour on the charts from "moderate", "deep", "brownish" and "dark reddish" oranges, through "deep", "moderate" and "dark" yellows to "light" olive brown. Primarily gundirr is the name for termite mounds. The name is used in a number of ways. It can refer to the broken lumps of termite mound used as a heat source in an earth oven. It is also the name for a paint made from the crushed clay from the mound painted onto the body as camouflage when hunting wallabies. In each situation where the word is used it functions as the name of the item rather than being a description of it.

Several other terms were encountered in the naming of colours. Some people referred to gulangulaj as a colour, though there was no uniformity in its identification on the colour charts apart from the fact that it was applied to some area of the reddish colour chips. gulaj is the common name for blood and it appears that gulangulaj is derived from it. One of the artists claimed that there were two kinds of red which could be named larrani, and that these corresponded to two other regular uses of the word. One of these is as the name of a red fruit, or as the name of the tree that bears it (Syzgium suborbicularis). The other is as the name for children of mixed parentage. This man saw these two different meanings given to the word as a basis for the identification of two different kinds of red. He distinguished them as larrani borum (red fruit) which ranged
on the charts from "deep", "strong" and "moderate" purplish pink to "moderate" yellowish pink, and larrani Yoljù (red person) which ranged from "dark" yellow to "moderately yellowish" brown.

In the above identifications of colours a particular naming process is involved. This is related to the Yolnu perception which appears to, in some way, equate part of an item with the whole item. Using that perception it seems that the name of anything can be used as the name for any of its parts, the name for any of its uses, or the name for any of its attributes. In each of these cases the meaning communicated is established by the context of its use. Thus gundirr is the termite mound, gundirr is the pieces of the mound, gundirr is camouflage paint made from it, and gundirr is its colour. Similarly clear blue sky can be gărak and clear blue colour can be gărak, a particular red fruit is larrani, a red person can be larrani and a red colour can be larrani. This I would suggest is a significantly different process from either the use of one name to describe another, or the metaphoric reference to one item in terms of the other. Rather it appears that one, in possessing attributes of the other, expresses something of the nature of the other. This is well illustrated in the uses of the word gundirr. It is fairly clear that the term originally was the name for the termite mound, but other things given the same name are not like gundirr, they are gundirr. That is they are in some way perceived to be essentially the same.

In table 4:2, I have attempted to show the relation between the pigment names, the colour names, and the identifications given to a number of pigments from different locations. It is possible to separate colour names from pigment names by recording responses to
<table>
<thead>
<tr>
<th>Specific Pigments</th>
<th>General Pigment Names</th>
<th>Colour Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ban'tulawuy gamunungu (belonging to Ban'tula)</td>
<td>gamunungu</td>
<td>watharr (white)</td>
</tr>
<tr>
<td>Yinitjuwawuy mol (belonging to Yinitjuwa)</td>
<td>djunapal</td>
<td>mol (black)</td>
</tr>
<tr>
<td>gunurru lirrgi (woolley-butt charcoal)</td>
<td>lirrgi</td>
<td>(charcoal)</td>
</tr>
<tr>
<td>mangu lirrgi (mango charcoal)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ban'tulawuy miku (belonging to Ban'tula)</td>
<td>miku</td>
<td>miku (red)</td>
</tr>
<tr>
<td>Yirrkalawuy miku (belonging to Yirrkala)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balawalangur miku (At Balawala)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>murungun (a weak form able to be crushed)</td>
<td>ratjpa</td>
<td>ratjpa (red purple)</td>
</tr>
<tr>
<td>ratjpa, däl (a hard form needing to be ground)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warrngawuy buthalak (belonging to Warrnga)</td>
<td>buthalak</td>
<td>buthalak (yellow)</td>
</tr>
<tr>
<td>Mirrnatjawuy buthalak (belonging to Mirrnatja)</td>
<td>or gangul</td>
<td>or gangul (yellow)</td>
</tr>
<tr>
<td>Dhondjiwuy buthalak (belonging to Dhondji)</td>
<td></td>
<td>mulkuminy (blue)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gundirr (brown)</td>
</tr>
</tbody>
</table>

Table 4:2. Relation between pigment names, colour names and specific pigment locations or varieties.
to the two questions, "What is this?", and "What miny'tji is this?". As the table shows, many, though not all the answers are identical. In normal practice a red pigment is miku and its colour is also miku, for the one word has both meanings.

From the foregoing discussion it appears that the lexicon of colour terms is not fixed, but open-ended. This allows for its expansion or contraction in relation to increased or decreased needs for differentiation. Whether individual Yolnu use a wider or narrower range of colours than others, each person appears to treat all the colours in their personal lexicon as being on the same level of classification. That is they do not generally recognise any of the terms described thus far as being subclassifications one of another. If there is an exception to this, it could be in regard to ratjpa (haematite), as there is some confusion concerning its position in relation to miku (red).

iv: The naming of secondary colour.

There appear to be two quite separate processes available for naming any colour sample considered as not truly matching any of the named primary colours. The first of these is the one already discussed, based on the use of the name of some other item the colour of which consistently represents the colour being classified. The other naming process appears to first focus on the identification of a set of named primary colours, (which, according to the individual may be from four to six or more in number), and then to evaluate the relationship between these and the colour sample being named. That is, any colour sample which is not one of the named focal or primary colours is seen as classifiable in relation to them. These "secondary" samples are able to be classified in relation to the primary colours in one of
three ways. First as a moderated form of the named colour, secondly as a modification of one colour in the direction of one of the other ones, or thirdly by a combination of the two names. Degrees of these modifications can be emphasised by voice inflection, but these do not appear to effect the above systems.

In earlier chapters I have discussed the use of two evaluative terms used to modify classifications. These were mirithirr (very) and märr ganga or märr (moderately/partially/almost). The use of mirithirr in conjunction with a colour term establishes a new classification which indicates an intense saturation/intense purity of the colour. For example the "brightest" red is mirithirr miku (intensely red) and undiluted black is mirithirr mol (intensely black) irrespective of whether the sample has a matt or a glossy surface. The use of märr or märr ganga with a colour classification indicates that the boundary of the classification is being stretched to include the particular sample. Thus the sample being classified is seen to have the attributes of the colour to which it is being related, but is considered to be only partially expressing them. In this approach to classifying colours there is thus included the notion of an ideal of each colour which then contrasts with samples that do not meet that standard. The result is the establishment of three classifications of each colour. That is, moderate colour (the colour term with a modifier), general colour (the colour term) and intense colour (the colour term with an intensifier).

The structure of this classificatory system is outlined in figure 4:1, using miku (red) to demonstrate the way modifications are applied to a primary colour term. The classifications are made on two levels, physical and metaphysical. On the metaphysical level, the
ideal miku is, in both colour and substance, considered to be a pigment formed as the metamorphosis of ancestral substance. There is then the colour expression of that pigment, which is also miku, forming a general central category, and potential for samples which do not express the colour at all, being classed as a type of pre-category. That is, being of ancestral substance, but not expressing the appropriate colour. Each of the three classifications at this level is thus considered to express the nature of the ancestor in some way. On the physical level of evaluation, the central (colour) category from the metaphysical level is considered in terms of the intensity of expression of that colour. Here the three classifications previously discussed are applied. Märr miku then refers to a partial or moderate expression of red, miku to a general concentration in which the colour red is dominant over any other colours or impurities, and mirithirr miku describes a specimen considered as pure colour of highest concentration.

<table>
<thead>
<tr>
<th>Metaphysical Level</th>
<th>Nature and Substance</th>
<th>Colour and Nature</th>
<th>Colour, Substance and Nature</th>
</tr>
</thead>
<tbody>
<tr>
<td>yaka miku</td>
<td>miku</td>
<td>miku (red pigment)</td>
<td></td>
</tr>
<tr>
<td>(not red)</td>
<td>(red)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>märr miku</td>
<td>miku</td>
<td>mirethirr miku</td>
<td></td>
</tr>
<tr>
<td>(moderate red)</td>
<td>(red)</td>
<td>(intense red)</td>
<td></td>
</tr>
<tr>
<td>miku</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(red)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4:1. Structure of evaluations used in assessing miku.

The second process by which secondary colours are named is a variation of the first. It is also one which enables reference to a precise colour not presently visible. In this approach a moderated colour classification is combined with the name of an adjacent colour, thus indicating the direction in which a colour has been
modified. Using this approach, a yellow which has been perceived as modified can be classified in a number of ways. For example, märr ganga buthalak, maŋutji mikutmirr, is moderate yellow, reddish (literally, eye red-having/red-eyed), märr ganga buthalak, gundirmirr is moderate yellow, brownish or brownish yellow, (literally brown-having) and märr ganga buthalak, mulkuminymirr is greenish yellow, (literally, moderate yellow blue-having). A variation of this second approach, one which appears to indicate a greater degree of departure from the focal colour uses a verbal form of the second colour term. Thus, a pure orange colour chip was described as miku märr ganga, buthalakthinya märr, (literally, red moderate, yellow-become moderately).

The third way in which I discovered secondary colours being classified was practised by two people only. One of these was an elderly man who spent many years of his life in a leprosarium where English was necessary for communication. He uses quite a few English words in his normal vocabulary. The other was a man in his forties with considerable experience over at least fifteen years with Western water colour and oil painting techniques and pigment names. The way in which they were naming modified colour was to use one colour name to modify another. The examples of this from them are moli miku (black red), and moli gundirr (black brown). Other Yolnu have insisted that moli cannot be used to refer to light values, or to modify other colour terms and that the expressions mentioned are not correct. On these grounds, I have chosen to ignore this method of description as not reflecting traditional practices.
Good and bad colour.

In discussing the naming of secondary colours, I mentioned in passing that the evaluations of intensity were based on criteria of saturation and purity. In the examination of pigment samples and of colour charts, these criteria emerged consistently as the basis of evaluations, although adherence to, or deviation from them was perceived to take a variety of forms.

Two separate assessments were made for me by different Yolnu who examined the B & K chart as a whole entity in contrast to examining and identifying the separate colours. Figure 4:2 records the results of one of these. He assessed the complete colour range, separating those colours which were considered mel darrtjalk (eye clean) from those which were not. Figure 4:3 shows the assessment made by a different man who separated those colours which he considered miny'tji manymak (colour good) from the rest which were described as yātjkurru (bad). though he did not name the colours he considered as "good".

Figure 4:2. Identification of mel darrtjalk (clean eye) colours on the B and K chart.
Both of these men made the evaluations spontaneously in an endeavour to help me understand Yolnu perceptions. In each case the colours selected were those which would be described as the most highly saturated. Black and white were not included in the choice of favoured colours, and this is almost certainly due to the structure of the B and K chart which has separated both black and white from the main chart. In contrast to this omission of black and white, the earlier discussed dramatisation of shopping in the store (page 100) indicated that both intense black and clear white are considered as good colours.

The Yolnu use a number of other terms to evaluate the quality of colour in addition to the above. For example, mārr gathirriyagu means "not good enough", "not a pure or representative specimen", or "not a true sample". It is used in the selection of pigment specimens when they are tested by rubbing on the surface of a rock. In that context it refers to a specimen which contains the required colour, but which is not considered pure enough. Such a specimen may be a reddish stone which is too brown or a yellow which is too red. The same expression is applied to fruit indicating that while it is...
not unripe, it is not quite fully ripe, and therefore the colour of
a perfectly ripe specimen has not been fully expressed. When the term
is applied to colour it thus is an evaluation which says in effect
that the item is usable when nothing better is available but not
really what is wanted and not the perfect example of a colour.

Colours may also be assessed as having another substance or
colour combined with them in some way which reduces their concentration
or purity. A colour may also be described as bulungga (dirtied), defined
as "like rainwater which falls clean but now lies in a puddle where it
is muddied"). There are a number of other words which describe a
similar perception of reduction in intensity through dirt or impurity.
Alternatively, what is perceived as an impure specimen of a colour
may be impure because of the intrusion of another colour. For example,
a yellow may be described as mikumirr (red-having) a description applied
to what in English would be considered as orange or orange-yellow,
or it could be mukuminymirr (blue-having) which would describe what
was in English a greenish yellow. Each of these evaluations indicates
the perception of ideals of colour which are represented by the named
primary colours with any divergence from that ideal representing a
qualitative reduction in both concentration and purity.

vi: Variation in the assessment of the Berlin and Kay chart.

In using the B & K chart, I used the same approach for
all eleven informants in that all were asked first for the names of the
colours, and were then requested to identify them on the chart. I was
not able, because of field conditions, to use a single recording
technique with all informants, but worked as opportunity presented
Figure 4:4. Discrimination of six colours. Colour (*) and Moderate colour.
A: watharr
B: buthalak
C: miku
D: mulkuminy
E: gapan
F: lirrgi

Figure 4:5. Seven colour named. Intense Colour (*) and Moderate Colour.
A: watharr
B: buthalak
C: miku
D: mulkuminy
E: gundirr
F: mol
G: gulugul

Figure 4:6. Five colours named. Intense Colour (*) and Moderate Colour.
A: watharr
B: gangul
C: miku
D: milkuminy
E: gurrgan
Figure 4:7. Five colours named. Colour (*) and Moderate Colour.
A: watharr
B: buthalak
C: miku
D: mulkuminy
E: mol

Figure 4:8. Four colours named. Colour (*) Moderate Colour
A: watharr
B: buthalak
C: miku
D: mol

Figure 4:9. Seven colours named. Boundaries are of greatest area
assigned to each colour. Focal point (0)
A: watharr
B: buthalak
C: miku
D: mulkuminy
E: gurrjan/mol
F: ratjpa
G: gundirrmirr
itself. Variations in the recording technique and the amount of information requested (see figure 15) did not effect the structures of the evaluations, but did cause variations consistent with the particular technique employed. These reveal some clear indications about the nature of Yolnu perception of colour that would not have been available without the variation.

With one man, all colours were identified in such a way that he could see all his assessments simultaneously (figure 4:4). He indicated no overlaps between colours, nor between two classifications within the domains of any one colour. In presenting this precise separation of classifications he was showing that for him they were perceived as being sharply divided and distinct from one another with definite boundaries between them. Four people had each colour with its modification recorded before proceeding to the next colour. Of these four, two were asked to indicate the zone of their colour then to indicate areas that were moderately that colour (figures 4:7 and 4:8). The other two (figures 4:5 and 4:6), were asked to indicate the intense examples of their colours and then the moderated form of them. None of these people made overlaps between the boundaries of the two assessments of each colour. (Though in the figures I have enclosed one within the other). Thus the four of them were also indicating that their classifications were sharply divided and distinct. However, the two elderly men responsible for the evaluations shown in figures 4:5 and 4:7 both remarked as they were assessing the moderate classifications that some of the chips were mixtures of two primary colours and could be classified both ways. For example, one colour chip could be classed as both moderate red and moderate white, and another one could be both moderate yellow and moderate white. In making these comments they showed an awareness that
Figure 4:10. Seven colours named. Intense Colour (●) and Moderate.
A: watharr
B: buthalak
C: miku
D: mulkuminy
E: mol/gurrnan
F: gundirr
G: gulaŋgulaŋ

Figure 4:11. Five colours named. Colour (●), Moderate Colour, and Focal Point (□).
A: watharr
B: buthalak
C: miku
D: mol
E: ratjpa

Figure 4:12. Eight colours named. Colour (●) and Moderate Colour.
A: watharr
B: buthalak
C: miku
D: mulkuminy
E: milkuminy
F: ratjpa
G: gundirr
H: mol
Figure 4:13. Eight colours named. Intense colour (§), and Moderate colour.

- Colour zone (more intense colour = •)
- Colour zone (more intense colour = ')

A: miku                  E: buthalak
B: larrani borum        F: gamunungu
C: yoljundyja larrani    G: mol
D: mulkuminy            H: ratjpa

Figure 4:14. Four colours named. Intense colour (•) and moderate colour.

A: watharr                  C: miku
B: buthalak                  D: mol
there were different ways of assessing colour. For example, it was possible to assess the colour of the chips, or alternatively, one could select the chips which represented particular colours. In the evaluation of the B and K chart they were being asked to follow the latter approach, therefore their evaluations showed clear boundaries between classifications of "colour" and "not that colour". As a result also, some areas of the chart were left unclassified, being considered as "non-relevant colour" or "unnamed colour" in relation to the colours being identified.

The remaining six people who examined the chart were asked to make each assessment of color, modified colour or intense colour separately. Each of these separate assessments was recorded and then erased before the next one was made. Two of these six, (figures 4:9 and 4:10) were asked first for the zones of their named colours, next to identify the areas of intensity of those colours and then finally the zones of moderation. In doing this I attempted to ask for the assessment of colours which were not adjacent to the one just completed. The next two (figures 4:11 and 4:12) I asked for the domain of each generalised colour named, for the moderation of each colour, and then for the focal point of each colour. The last two people were asked for the intensity of some colours, the general zone of others and the moderations of each (figures 4:13 and 4:14). One of these last two was then also asked to indicate the focal point of each colour.

Four of these last six people, in making their assessments, showed overlaps of the boundaries between primary colours and of the boundaries between the categories of each colour. One, (figure 4:12), showed no overlaps except between two categories of a single colour. The last of the six (figure 4:14), was a young well educated man with,
<table>
<thead>
<tr>
<th>Figure No.</th>
<th>Recording Procedure</th>
<th>Information Requested</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>All colours recorded on chart and all visible at one time.</td>
<td>Indicate colours named and then moderation of each colour.</td>
<td>six colour with no overlaps</td>
</tr>
<tr>
<td>5</td>
<td>Two zones of one colour on chart then erased before next colour started.</td>
<td>Indicate intensity of colour and then moderation of it.</td>
<td>Overlaps only between moderate of adjacent colours</td>
</tr>
<tr>
<td>6</td>
<td>Each assessment of any kind made separately and erased before next assessment made.</td>
<td>Indicate colour named and then moderation of that colour.</td>
<td>No overlaps</td>
</tr>
<tr>
<td>7</td>
<td>Each assessment of any kind made separately and erased before next assessment made.</td>
<td>Indicate general zone intensity and moderation of each colour</td>
<td>No overlaps between intense and moderate, overlapping of most adjacent moderations.</td>
</tr>
<tr>
<td>8</td>
<td>Each assessment of any kind made separately and erased before next assessment made.</td>
<td>Indicate general and moderate zones of each colour and focal point of each.</td>
<td>Overlaps of moderate reds only</td>
</tr>
<tr>
<td>9</td>
<td>Each assessment of any kind made separately and erased before next assessment made.</td>
<td>Indicate two zones of each colour</td>
<td>Small domains with no overlaps</td>
</tr>
<tr>
<td>10</td>
<td>Each assessment of any kind made separately and erased before next assessment made.</td>
<td>Indicate two zones of each colour</td>
<td>Much overlapping.</td>
</tr>
<tr>
<td>11</td>
<td>Each assessment of any kind made separately and erased before next assessment made.</td>
<td>Indicate two zones of each colour</td>
<td>No overlapping.</td>
</tr>
</tbody>
</table>

Figure 4:15. Variations in the approach to the Berlin and Kay Chart.
at the time, severe emotional problems. He found real difficulty making each of his assessments. The collation of these shows quite small domains of each category and no overlapping of boundaries at all. In each case where people were asked to indicate the focal points of colours these were located within the "intense" classification domains.

In these varied assessments there appears to be a definite correlation between the recording style and the results obtained. (see figure 4:15). Where classifications are recorded without reference to one another, there tended to be overlapping between adjacent categories, and sometimes overlapping of more distant ones. The type of relationship between categories produced by this recording approach is schematised in figure 4:16.

![Figure 4:16. Relationships between categories evaluated separately](image)

Figure 4:16. Relationships between categories evaluated separately

= "intense" colour  = "general" colour
/or = "moderate" colour. A, B, C, - F. = focal points of each colour.

Where the individual's assessment was visible on the chart in front of him, he gave no chip more than one classification, and there were therefore no overlaps between the boundaries of categories. This type of classification is schematised in figure 4:17.
The first of these two patterns appears to record what the Yolnu apprehend with the physical sense of sight. In this approach the person examines the whole of a continuum of colour in an attempt to identify every colour chip which can be considered as representative of a particular colour classification. This results in the indication of a domain of colour being identified which includes a range from the best examples to those which only partially express it. With different people there is variation in the extent of this range, but for each individual the process is the same. The result is that those chips which can be considered as representing a mixture of two or more colours will be given that many separate classifications. The overlapping of categories clearly indicates that the Yolnu both apprehend with the physical senses the full continuum of colour across the spectrum represented by the colour chart, and are able to verbalise it.

Figure 4:17. Relations between classifications when all are visible on the chart simultaneously. (Coding as for figure 4:16)

The second of the patterns, (figure 4:17) appears to indicate perceptions as they are constrained by culturally standardised classificatory principles. In accordance with these, the colour chips are allocated to distinct relational classes. The evaluations then
reflect the structures which exist at the cognitive level and they
demonstrate the way in which continuum is dealt with in the culture by
by classification into discontinuous classes.

In these assessments of the B and K chart, it is the contrasting
structures of the evaluations established in the two contrasting types
of evaluations which are significant for this discussion, not the
evaluations themselves. In the first type, the assessment is not
relational, and the results reflect physical perception. In the second
the assessment is constrained by culturally established criteria, and
the results reflect the imposition of the cognitive structures on
perception.

vii: Variations in the meanings of evaluations according to context.

I have shown in figure 4:1 the three part classification of
natural or physical colour and pigments from two different evaluative
approaches, physical and metaphysical. By establishing a hypothetical
set of five colours, and pigment samples representative of them, it
is possible to demonstrate the relative nature of the classifications
of them. I have schematised these relations in figure 4:18. At the top
of the figure, I have placed the hypothetical samples. The first line
of evaluations illustrates the classifications which could be made of
the pigment and colour samples from a metaphysical approach in which
the focus is on the purity and concentration of the "colour"
represented by the pigment transformation from a person's own site. In
that context, a really good pigment sample from another site is only
relatively good or average by comparison. The second line of the
figure illustrates how the evaluations from the same metaphysical
perspective are likely to be applied when there is an absence of the
"better" (one's own) pigments. This could apply particularly if there is a situation of urgency in the need for a particular coloured pigment as when painting a corpse or preparing for mortuary rites. The bottom line of the figure represents how the evaluation is applied where the focus is on the colour and the approach to evaluation is in terms of physical properties. Thus while the structure of the relations between the evaluations remains consistently three part, the meaning of each evaluation remains relative both to the other evaluations and to the perspective from which evaluations are made.

viii: Conclusions.

In this chapter I have discussed in detail, various aspects of Yolnu classification and conceptualisation of colour. Examination of the material reveals that the Yolnu have developed solutions to two different kinds of problems. The first of these is related to pragmatic issues.

---

<table>
<thead>
<tr>
<th>Perspective of focus of Evaluation</th>
<th>Different Colour or Pigment</th>
<th>Mixed Colour or Pigment</th>
<th>Average Sample Colour or Pigment</th>
<th>Concentrated Colour or Pigment from other site</th>
<th>Pigment from own (sacred) site</th>
</tr>
</thead>
<tbody>
<tr>
<td>In terms of &quot;ideal&quot;</td>
<td>Not&quot;x&quot;</td>
<td>Moderate &quot;x&quot;</td>
<td>&quot;x&quot;</td>
<td>Intense&quot;x&quot;</td>
<td></td>
</tr>
<tr>
<td>Absence of better samples</td>
<td>Not&quot;x&quot;</td>
<td>Moderate &quot;x&quot;</td>
<td>&quot;x&quot;</td>
<td>Intense &quot;x&quot;</td>
<td></td>
</tr>
<tr>
<td>In terms of &quot;colour&quot;</td>
<td>Not&quot;x&quot;</td>
<td>Moderate &quot;x&quot;</td>
<td>&quot;x&quot;</td>
<td>Intense&quot;x&quot;</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4:18. Relations between classifications made in different contexts.
concerning the classification and evaluation of colour. These involve answering such questions as, "What colour is this?", "Is this red?", and "What quality of red is this?". The second is related to metaphysical issues concerning the innate nature of colour and of pigments and the relations between them. It involves answering such questions as "What is colour?".

I consider first Yolnu solutions to the pragmatic problems restricting the discussion at this stage to considerations related to colour only. Issues concerning the relation between colours and pigments are dealt with in association with the metaphysical problems. The pragmatic issues can be divided up into roughly three areas each of which can be linked to one of the three questions used above as examples. I use these questions as a focus in discussing each of the respective problem areas.

The first problem area concerns the identification of the colours with which the Yolnu are confronted. It relates to the question, "What colour is this?". In confronting this problem the Yolnu have divided up the colour continuum in relation to identifiable colour referents as I have shown, these range from the colours of four or five pigments to the colours of fruit, sky, or other objects. The result has been the establishment of an open-ended lexicon of colour terms under a general category "colours". Structurally this solution can be considered as being composed of a class, colour, which has a number of members. The number of members appears to be irrelevant beyond the fact that the current minimum is four. On this basis, the members of the minimal lexicon can be listed as; "a", "b", "c", "d" and "n", where "n" represents not a category, but an open end to the lexicon through which other items may be added. The thought behind such an addition appears to be not that the item is new in terms of existence, but that it is new in terms of
recognition and of being separately distinguished. Any colour, for example "a", is perceived to have its own distinguishing features which are characteristic of its identity. Its identity is then represented by the expression of those features, while the contrasting features of any other colour, for example "b", are those which distinguish it from "a". The structure of the relationship between class and classmember and and between the members themselves can then be represented as in figure 4:19, by a simple taxonomic-like tree diagram.

![Figure 4:19. Structural relations within the class "colour".](image)

The Yolnu who use additional colour terms simply add them at the same level without considering this as altering the structure. For example, "x". Where they distinguish what appear to be "varieties" of red such as miku (red-ochre red), larranji (apple), gulangulan (blood) or ratjpa (haematite), these are used, not as sub-categories of red, but as separate and distinct members of the class "colour" on the same level of classification as each other. This was shown particularly in the responses recorded on the I.S.C.C. charts of colour chips. Where each separate "red" was named there was then a reduction in the range of colour assigned each of the adjacent colours. Confusion comes where the Western term "red" has been consistently translated as miku (red_ochre red), and attempts have then been made to force the other terms into a sub-category level where they do not fit.
The second pragmatic problem area considered by the Yolnu relates to the boundaries established for the members of the colour lexicon. The simple question "Is this 'b'?", indicates an assumption that an ideal for the colour "b" has been established, and can be recognised by the presence of certain attributes. The Yolnu answer to the question is either "Yes" or "No", and the structure of the solution is that of the binary opposition between "b" and "not 'b'". There does not appear to be any assumption that "not 'b'" will be a particular opposite colour. That is the colours are not paired in oppositions, but each is contrasted against all others in the lexicon.

It appears that in the establishment of boundaries for particular colours such as miku (red-ochre red) or gangul (yellow), precise colour foci have been selected, and then all colours which could be considered as in any way representing its attributes have been classified with it. This has resulted in each colour term being used to classify a wide section of the colour continuum. It has also raised for the Yolnu the third problem, that of the evaluation of the relations between the colour foci and particular colour samples which, while falling within a general colour classification, may not match its focal point.

The Yolnu have chosen to relate these non-focal colours to the foci of the colour lexicon through an evaluative frame which appears to be inevitably composed of three categories. Each of these maintains a consistent relation to the others irrespective of the Yolnu vocabulary which is used to describe or classify them as shown in figure 4:20. The classifications are often given in answer to, or as modifications of the answer to the first question. In fact they are answers to the (covert) third question, "What quality of 'x' is this?".
These three categories are relational statements, relative to each other and to the perceived nature of "x" as determined by the solution to the yet to be discussed philosophical problems.

The second kind of problem considered by the Yolnu is concerned with the nature of colour and of pigments, and with the relations between them. Linked with the consideration of these issues are the Yolnu metaphysical investigations into the relationships between the tangible elements of the physical world and the intangible elements of the supernatural. In simple question form the problem area is confronted by asking, "What is 'x'?", where 'x' can be either colour or pigment. The varied answers given by the Yolnu enable an exploration of their assumptions concerning the nature of colour and pigment and an analysis of the structures used in framing those answers.
In the ethnographic sections of this chapter I have demonstrated that the Yolnu do perceive relationships between the colours of pigments and the colours of other things. They have also been shown to see relationships between the coloured pigments and the supernatural dimension of the creative beings. In relation to this latter, they appear to have assumed that, that which exists, is in essence unchanging, and perhaps unalterable, although the external appearance or form may change or be changed. This notion is perhaps best exemplified in the red pigment from Balawalanur on Howard Island (see page 103). In its natural state this is a greyish-white clay which has to be roasted before it turns red. Before roasting it is referred to as miku (normally red, or red pigment) without being visibly the colour miku. After roasting it is miku and its colour is also miku, a colour which can be rubbed off onto other things making them also miku. In each of these forms, the grey clay, the red colour, and the red pigment, it is known to be simultaneously the actual faeces and blood of an ancestral dugong. Its essential nature is thus perceived to be all of these things irrespective of the external appearances of the current transformation.

This notion was further demonstrated in the earlier craftroom discussion (page 96) where a piece of red-coloured pigment was described as really yellow that had changed its outward expression of colour. It is known that heat will change the colour, but for the Yolnu, this change is considered to be in outward appearance only. Although the outward appearance was red, the pigment was gangul (normally yellow or yellow pigment) from a particular site at Mirrnatja, and was the yellow fat of an ancestral green turtle. The essential nature of the substance, linked to yellow was unchanged, and still called gangul irrespective of the red outward appearance. The consideration which is in focus then, is neither colour nor pigment but the essential nature of the supernatural which is expressed in each.
From the metaphysical approach there are three forms in which the essential nature is expressed. In the first it is present in a tangible form, but not expressed. This is exemplified in the mikü which is an unroasted grey clay, or the "yellow" ochre which looks red. The second expression of the essential nature is that of colour. It appears that the colour of the pigment, the colour of things coated with it, and it seems that of any item which is naturally or even artificially that colour can be perceived as being an expression of the essential nature. The third and most intense expression of the nature is that in the pigment form. This last expression is both the colour and the essential nature of the ancestral item transformed, and has in some way the power to transform other items into its likeness. 12

The relations between these three forms are analogous to the relations between the three categories of physical colour. The first form of the essential nature and the first category of colour represent partial or incomplete expressions of the particular focus of classification. The second classifications are analogous in that they represent generalised expressions of the particular qualities in focus when these are compared to the third classifications which represent the "ideal". The "ideal" in each case can be considered as equivalent to an absolute representation of the quality being considered. The relations between these classifications are compared in figure 4:21.

In addition to the analogous relations between the two three-part structures, the Yolnu perceive a continuum to exist between them as outlined in figure 4:22. Because the same classifications are made at more than one level, it is possible for the Yolnu to answer the question "What is 'x'?" at more than one level. The classification of "not
colour 'x'" on the physical line becomes identified with the classification of "non-expression" of "x" on the metaphysical line, enabling the Yolnu to consider that "not colour" does not mean the same as "non-existence". That is, existence is able to be considered as continuing even when not visually apparent. The second or central metaphysical classification of "x" has meaning as, "generally expressing the colour of 'x'" and as "generally expressing the nature of 'x'". In either case, "x" can be considered as a pigment, its colour, or the metamorphosis of a particular ancestor.

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>moderate, impure, diluted &quot;x&quot;</td>
<td>ordinary, average &quot;x&quot;.</td>
<td>concentrated or pure &quot;x&quot;</td>
</tr>
</tbody>
</table>

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<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>expression or non-visual expression</td>
<td>partial</td>
<td>general physical expression or visual expression</td>
<td>solid, concentrated or pure expression.</td>
</tr>
</tbody>
</table>

Figure 4:21. Comparison between classifications of colour and of the "essential nature" of pigments.

The use of the one name for the pigment, for its colour, and for the other differently coloured forms in which it occurs, is an expression not of the use of the name of one to name the other, nor is it a metaphoric reference from one to the other, but the use of one name to identify related expressions of the one essential nature. Thus when a blue coloured chip is related to the colour of sky or water, what is perceived is an expression of the essential nature of these things.13
When other previously unnamed colours are named, they are seen as I argued earlier, not as named after some object but as expressing something of the object and thus as being a different expression of its nature. Jones and Meehan (1978:34) suggest for the Anbarra that there is "the implication that the actual pigment is within the entity that has that colour". I would argue that for the Yolnu, the essential nature of any item of a particular colour is potentially identifiable as expressing the essential nature of any ancestral being identified with that same colour.

NOTES.

2: For example, Berlin and Kay (1969), and Witkowski and Brown (1981).
3: For example, Jones and Meehan (1978), Hallpike (1979) and Turton (1980).

<table>
<thead>
<tr>
<th>Non-colour expression of nature of &quot;x&quot;</th>
<th>General Physical Colour &quot;x&quot;</th>
<th>General expression of nature of &quot;x&quot;</th>
<th>Pigment &quot;x&quot;</th>
<th>Nature &quot;x&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Physically colour &quot;x&quot;</td>
<td>Partial &quot;x&quot;</td>
<td>Generally &quot;x&quot;</td>
<td>Pure &quot;x&quot;</td>
<td>More than physically colour &quot;x&quot;</td>
</tr>
<tr>
<td></td>
<td>Physically colour &quot;x&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 4.22. Relations between physical and metaphysical classifications of the colour "x".
4: The other two charts were made up from ISCC-NBS Centroid Color standard colour chips. One of these was the set of ISCC-NBS Color-Name Charts, The other a freely arranged spectrum of the chips. All three charts were covered with clear celluloid enabling responses to be recorded with chinagraph prior to transfer to record sheets.

5: The correct wordings for the different questions were as follows:

   Nhā dhulanydja mala miny'tji?
   What this group colour/design?
   (asking about the multiple items).

   Nhā dhulanydja miny'tji?
   What this colour/design?
   (asking about the item as a whole).

   Yolku malaw miny'tji?
   Whose group's colour/design?
   (of people)
   (asking about the design ownership).

6: Morphy (1977:92-93) discusses other examples of the use of the word miny'tji.

7: See notes 1 and 2 above.

8: It is this process which I have shown to be the means of increasing the colour lexicon.

9: I investigated whether there was any difference between the perceptions of colour with matt surface and that with highly reflective surfaces such as coloured aluminium foils. Discrimination was made between the shiny and dull surfaces but the colours were treated as unaffected by these.

10: This perception appears to be very closely linked to the perceptions of transformations of creative beings, a view which holds that a transformation is essentially the creative being in a different form. This notion appears to be relatively widespread throughout Australia.

11: The Yolnu do have sub-categories of some classes as I show in Chapters Two and Five. There is therefore a cognitive level structure which exists for sub-classification. The evidence from my field investigations however is overwhelmingly in support of the argument that in the domain of colour, all terms used as primary terms in the sense that I have described are treated as on the same classificatory level.

12: In certain situations, particularly related to ceremonial, the object thus painted, instead of being seen as symbolic of the essential nature, is seen as possessing and expressing and perhaps even as being transformed into that nature, thus causing the intangible ancestral being to become tangible in a new metamorphosis.

13: In the next chapter I show that both sea and sky are perceived to have or express life. Thus there appears to be a link between the essential nature of all things and some attribute of life.
CLASSIFICATIONS OF LIFE AND EXISTENCE.

The classifications applied by the Yolnu to living and existing things are many and varied. My concern is to identify the different systems used in these classifications and to discover the structures of those systems.

The following discussion falls into two main sections. In the first I consider Yolnu categories of life and existence, and various concepts associated with the allocation of items to those categories. In the second I examine different systems of classification applied to one of these first Yolnu categories, that of "Naturally Living Things". The second section contains the main body of data, which is dealt with from three different perspectives. First I consider matters relevant to species and sub-species levels of classification. Subsequent to this I examine a range of classifications applied to the species and thirdly the types of variations encountered in the classifications made by different Yolnu.

1: Categories of Life and Existence.

The Yolnu have divided what they perceive to be the total environment of existing things into five categories. Each of these is distinguished from the others by the mode in which they express the characteristics of life. These categories include all things which have a physical form and which are able to be apprehended with the physical senses. They also include those things of an intangible nature which are
understood to have existence, but which cannot normally be considered to have a physical form. I discuss first the attributes by which these five categories are distinguished and then examine the structural relations between them.

Figure 5:1 gives an outline of the simplest of these distinguishing features, with reference to a representative item from each category. There is seen by the Yolnu to be a contrast between the physical things which are *walgamirr* (*life-having/life-expressing*) and those which are *walgamiriw* (*life-without/life-not-expressing*). Those which are "life-having" are considered to fall into different categories each of which expresses a qualitatively different attribute of "life".

<table>
<thead>
<tr>
<th>Category</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Example</td>
<td>rock</td>
<td>sun</td>
<td>animal</td>
<td>man</td>
<td>spiritual</td>
</tr>
<tr>
<td>Physical</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Life-having</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Moving</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+ or-</td>
</tr>
<tr>
<td>Breathing</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+ or-</td>
</tr>
<tr>
<td>Law-keeping</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Abnormal (Law status)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

Figure 5:1. Basic attributes of five categories of existence.

In the category "life-without" are those thing which do not move themselves and those things which have had life in some way and now are dead. Rocks, sand and earth are included, as are the ochres (in the sense of being physical materials), and the whole of the physical landscape. The dead wood of trees, the empty shells of shellfish and the bones of animals of all kinds including human, are remains of items
which have had life and now do not. Implements such as canoes and spears do not move themselves, so they are included in this category. Fresh water which has become stagnant or polluted, such as rain water which has become muddied in a puddle is also considered to be "non-living".

The first of the categories of living things includes things which move themselves and those which have an effect on others. This latter may be by causing them to change in some way, by actively changing them or by causing them to move. At this point Yolnu perception is quite different from that of Western society, which would place all the items in this category into a Western "non-living" category.

For the Yolnu, the sea or salt water is "life-having". Two People gave different justifications for their assessments of it as belonging to this category. The first said it was because "You can see it moving, the second said,"It drowns people". Fresh water is "life-having" when it is still fresh and drinkable as"when it has fallen into a clean rock hole. It also has the capacity to "refresh the life of plants". Rain fits this category for the same reasons. I was told that clouds move, and change in shape, size and colour, "so they must be alive". Fire is alive, "touch it and you will find out". The sun gives light "for Yolnu and trees and what all else", so it with moon and stars which also move across the sky, is "life-having". Trucks and cars are also "life-having" whether they are actually moving or not, as long as the engine will work. Once a vehicle breaks down it "dies" and hence no longer belongs to this category but transfers to the category of "life-without" things.
While it was movement or the potential to change or cause change which most characterised the first category of "life-having", the second category is characterised by the ability to breathe or to reproduce. As one person observed most of them are yanaramirr (tail-having), yanara being the tail of animals and birds, fish and stingrays, a part of the fleshy structure of shellfish, and the trailing or climbing stem of many root foods. All of these things then fall into this second category of "life-having".

The characteristics of this group which exemplify "life" are not always easily visible, but a number of justifications were given for each of the above-mentioned items being included. Shellfish which are attached to rocks, "squirt when you touch them" and that shows that they are breathing. The opening and closing of bivalves and the retraction of univalves into their shells was also seen as breathing. All plants are known to grow from seeds, "You can see that because when you pull up the prickly grass from round the camp and burn it, other prickles grow up again from the seeds". Similarly the cycad palm is observed to drop its seeds and the various stages of their transformation into new plants are known and named. Animals of all kinds and marine vertebrates and crustaceans are all in this group as they all have all three of the above-named characteristics.¹

The third category of "life-having" things is the only one which is lexically marked. It is the category Yolŋu (human or person). There are a number of features which are seen to distinguish humans as a category from all others. Largely these are described as the presence of those features absent from the previous categories, or the absence of some of those present. For example, humans don't have tails as the members of the previous category do. In contrast, they do have ŋayŋu
(the location of the emotions), so they are able to forgive others and to contribute to the well being of others, while as one person suggested, using kangaroos as an example of the "naturally living" things, "it is characteristic of kangaroos that they do not forgive one another. Humans have and keep laws while animals do not, and humans are also djunjynmírr (with understanding) so that, unlike animals, when they have experiences they learn from them. Finally, humans have spirits which continue to exist after death, whereas the members of the other two "life-having" categories do not.²

The final category is one basically concerned with "spiritual" existence, and is established as a category through the Yolnu metaphysical approach to existence. It includes the non-physical remains of humans after death, as well as a number of other things. There is considerable variation between Yolnu as to what items do fit into this category, and where there is agreement as to the inclusion of an item, there is often some variation in the perception of its nature or its definition. It appears that anything in any way spiritual or supernatural can be included in the one classification. If there are any subdivisions, these did not appear in my discussions with the Yolnu. Into the category come the creative ancestors (wajarr), who were physically alive in the distant past. These beings are now non-physically present, though they have left physical manifestations of themselves in ceremonial objects and in many transformations in the physical environment. These transformations are able to be perceived from two different perspectives. Viewed with the focus on their spiritual attributes, things like pigments, landforms and man-made objects which are normally in the "without life" category are all considered to have non-physical or supernatural attributes and to belong to the category of "spiritual" things.³
There appear to be two aspects of the after-life existence of humans which also belong to the "spiritual" category. First there is the birrimbirr which appears to be an after death transformation of what the Yolnu see as the normal non-physical part of humans. Secondly there is the mokuy, a term with a number of distinct meanings. One meaning of the word is the after death transformation of the physical form of a person, a transformation which appears to express the less pleasant characteristics of the deceased. When there is a death, the dead person is referred to as mokuy. In that context, the reference is to both the physical corpse, and to the person who has died. In addition to those uses of the word, there are a number of named and distinct spirit beings which are collectively given the name mokuy. These are associated with particular clans and believed to dwell in particular locations in the clan territory such as in a named section of rainforest or of the open Eucalyptus forest. Each of these is known to carry on activities similar to humans but in an exaggerated form.

The relationships between the meanings associated with the members of this "spiritual" category is complex and cannot be fully explored in this thesis. It is sufficient to state that the members of the category are perceived to exist, and to recognise that together they fall into a single generalised category which can best be described as "spiritual" existence.

The Yolnu have been able to establish the five categories of existence by focussing on the attributes as described above. It is now possible, having discussed each of them separately, to consider the relations between them. In their discussions of these categories the Yolnu frequently combined a physical perception of them with a metaphysical perception. For the purpose of examining them I will attempt to separate the two and then to show their inter-relations.
All physical things are included in the first four categories. The vernacular terms *walŋamirr* (*living/life-having*) and *walŋamiriw* (*life-without*) indicate a basic dichotomy between those things which have or are expressing some attributes of the quality "living", and those which are not. Each of the three categories of "life-having" things forms a part of one side of this dichotomy, and each of them separately is able to be seen as structurally in opposition to the category of "non-living". Each of them is also seen as containing items which in varying degrees express attributes of the quality "life". The first of these categories includes those things which least express "life". The second, that which includes animals and plants, expresses a more intense quality of life and the third or human category, the most intense expression of life. I have, for the sake of clarity, chosen to identify the first category as "expressing life", the second as "naturally alive" and the third as "human life", as these terms convey something of the Yolnu perceptions of the categories. The categories of physical things can thus be considered, as shown in figure 5:2, as lying along a continuum from less to more intense expressions of life, from non-living to human.  

![Figure 5:2. Relations between categories of Physical Things.](image-url)

The Yolnu metaphysical approach adds a further dimension to each of the first four categories and then includes a fifth category, "supernaturally alive". "Living" things become not just "living", but
"physically living" things which are both physical, and express the quality of "life". "Non-living things are then perceived not as "not alive", but as being "physical" and as "not expressing" the quality "life". Thus there is a continuum maintained, but along it an emphasis shift occurs such that there is a progressive transformation from physical to non-physical and from a non-expression of life to a supernatural expression of it.

Different attributes of some items enable them to be included in both the polar categories so that the qualities of these items can be seen as in a relationship of opposition to the categories at both ends of the "living" continuum. In this way the continuum is able (from a metaphysical approach) to be bent into a cyclical pattern with the same items at both ends. The category

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Figure 5:3. Metaphysical relations between categories of Existence.
"not-living" becomes instead of a non-existence of life, a phase in the cycle of life. Simultaneously it can be considered that the life which exists in items in this category is in an opposite form or state such that the category represents a phase of non-expression rather than being a category of non-existence. Because of the contrast between the two sets of attributes in the items which fall into the two polar categories, there becomes not a completely circular continuum but a spiral structure in which a form of parallel or analogous relationship is perceived to exist between the two polar categories. I have attempted to illustrate the structural relations of this continuum in figure 5:3

2: Living Things.

i: The Species.

a. The Recognition of Species

The Yolnu consider that living things exist as a wide range of species, with each member of a species having the same kind of existence as every other member of it. There is no attempt to be exhaustive in the naming of species and while there are over six hundred named species, those that are named are the ones which are significant in some way or another. Unnamed species are known to exist. While these are generally ignored as insignificant, in a number of generic groups all small species are grouped together under a single term that appears to mean, "all small species of this class". For example, laŋlaŋ are all small lizards, djikay are all small birds, and nyiknyik are all small marsupials.

There is generally a direct correspondence between the Yolnu classifications of species and the scientific ones, though there are a number of variations from this. A number of scientifically separated species with very similar characteristics may be classed as a single
species by the Yolnu. For example the yam bwaŋ represents two scientific species. In contrast to this, two Yolnu species, genydpija and djan'pa were given the one scientific classification of Ficus virens. In terms of the analysis of classificatory structures, it is not important whether there is direct correspondence between the two systems or not and I include these examples only to show that there are variations.

**i:b. Discrimination Between Species.**

There appears to be no consistency in the choice of features by which species are distinguished. Rather it seems that discrimination is

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>DISTINCTIVE FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>garriwa</td>
<td>diltji bilkpilk</td>
</tr>
<tr>
<td>Chelonia depressa</td>
<td>back flat</td>
</tr>
<tr>
<td>Flat-back Turtle</td>
<td></td>
</tr>
<tr>
<td>birrgarr</td>
<td>body like garriwa but diltji gurriri and lays little eggs</td>
</tr>
<tr>
<td>Lepidochelys olivacea</td>
<td>back short</td>
</tr>
<tr>
<td>Pacific Ridley</td>
<td></td>
</tr>
<tr>
<td>guwarrtji</td>
<td>garrupumirr</td>
</tr>
<tr>
<td>Eretmochelys imbricata</td>
<td>having back covered with plates of turtleshell</td>
</tr>
<tr>
<td>Hawksbill Turtle</td>
<td>nyumukuniny gurrru</td>
</tr>
<tr>
<td></td>
<td>little nose</td>
</tr>
<tr>
<td>dhalwatpu</td>
<td>marr mol mulkurr</td>
</tr>
<tr>
<td>Chelonia mydays</td>
<td>yindi diltji, mol</td>
</tr>
<tr>
<td>Green Turtle</td>
<td>moderately</td>
</tr>
<tr>
<td></td>
<td>big back, dark.</td>
</tr>
<tr>
<td></td>
<td>dark head</td>
</tr>
<tr>
<td>gärun</td>
<td>mulkurr dumurr</td>
</tr>
<tr>
<td>Caretta caretta</td>
<td>head large</td>
</tr>
<tr>
<td>Loggerhead Turtle</td>
<td></td>
</tr>
</tbody>
</table>

Figure 5.4. Distinctive features of five marine turtles.
on the basis of whatever features are prominent. Each species within a
class or subclass may be distinguished from the others by a different
characteristic. For example, there are five species of marine turtles
in the region and each of these is described (as in figure 5:4) by its
most prominent features.

As can be expected from the descriptions of the first two of the
above species, many of the Yolnu who now have limited hunting experience
fail to distinguish between them. In contrast, the more experienced older
men have no difficulties with identifying them even from photographs.
The features described above concentrate mostly, though not exclusively
on shape. The precision with which they can also be explained visually
by some individuals is shown in the following drawings (figures 5:5.a,
and 5:5.b) which were done for me by the senior Golpa clan man.
Neither of his drawings were ever miss-identified by other older men.

![Diagram of turtle species](image)

**Figure 5:5. Two turtle species and a composite drawing.**

In addition to shape and surface appearance, other attributes such
as colour and habitat may also be significant as in the descriptions in
figure 5:6 of three distinguished species of dolphins.
yinydjapana ɲurr ɭewɛn nhakunã warrukuy - lirra ɭewɛn
nose long like barracuta teeth long
yellow/white on underside, purple-brown body.

buku-yulgu dhumbul ɲurr ɭurr rumbal balanya bili yinydjapana
short nose but body just the same as "
light yellow-brown body - short teeth, galki manijur
(lives) close river-at

dhawulunjaniŋ ɲurr ɭewɛn, ɭurr yindi - black, swims in deep water
nose long but big

Figure 5:6. Distinctive features of three dolphin species.

Habitat is frequently referred to in the description of species other than dolphins. For example, the only distinction made between two edible insect larvae was that one, ɡamuruj, is found in the swamp rushes and in the rotting timber of particular trees, while the other, gunana, is found in termite mounds. Other features referred to in discriminating species are, the style of locomotion the sounds made, and behaviour patterns. Thus some pigeons have distinctive flight patterns, some hawks are distinguished by their calls, and some snakes by their placid nature in contrast to the fierceness of others.

In practice, the recognition of species is learned, not by the memorisation of distinguishing features, but by the identification of specimens in the field. Recognition of a person's authority in identifying specimens is based not on a knowledge of the distinguishing features, but on recognised status within the community as a person of seniority and therefore of knowledge. When two informants of relatively equal status disagree in the identification of a specimen, they may resort to pointing out particular features in support of their opinions. If relations are
amicable agreement may be reached in this way. In general, distinguishing features are resorted to in the description of absent species, rather than being consciously used in the identification of specimens. In teaching another person, or in emphasising the correctness of an identification, a person in a teaching role may use them in a context such as, This is garriwa. See, its back is flat.

i:c. Intraspecific Classifications.

Once a specimen is identified, there are various other factors which may or may not be taken into consideration. For some species there appears to be no concern at all with intraspecific classifications, for others a considerable amount of interest is shown. I list six areas in which intraspecific classifications are made and discuss the first four of these in an attempt to indicate the scope of interest shown, and the structures used in making them. The areas are sexual classifications, observations of anatomical variations, naming of anatomical parts, variations in maturation/size, and the use of kinship terms and personal names for family pets.

Sex, at least in larger species, is a matter of general observation and comparison. There is nevertheless considerable variation in the degree of lexically marked discrimination in the different species. In some species where the sexual features are easily observed, separate names may be given for the male and the female in addition to the species name. For example, in the species *weti* (*agile wallaby*), a large male is called *balkitj* and a large female *djarrwutu*. In the species *mitiwiiri* (*brush-tailed possum*), the male is *gapadi*, and the female is *marrgu*. In other species, one sex will be given a discrete name while the species name is used for the other. For example, the species name *garrtjambal*
(antilopine kangaroo) used in a general sense can refer to either male or female. However in some contexts it appears to be used specifically of the male in contrast to the female which is then named gandalpurru. Similarly dhalwatpu (green turtle) refers to the species male or female while the female may be specifically called wayapa. The female when ashore depositing eggs is called dhalaluwa in a classification which combines both sex and action discriminations.

Where the basis of discrimination is restricted to sex alone, then the potential structure for sub-classifications is as shown in figure 5:7. It is possible for either or both sexes to be left lexically unmarked. When discrimination is then desired it can be made by applying the general term for woman (miyalk) or man (dirramu) without altering the structure.

![Figure 5:7. Structures used in discrimination by sex.](image)

I did not discover a great deal of interest in morphological variation, though there is one definite example related to one of the turtle species. Amongst the dhalwatpu (green turtles) there is apparently the regular appearance of specimens with a shallow depressions up the centre of the carapace. These specimens described as jaraka dhukarrmirr (carapace having a road or path) are separately named wol.

The structure of the system available for such subclassification can be represented as in figure 5:8. The difference between this
structure, and the preceding one is that neither the potential number of variations nor the basis for discrimination is fixed.

Figure 5:8. Structure used in discrimination of variations from an expected standard.

The naming of anatomical parts can only be briefly considered. Body parts are highly significant and a very large vocabulary is used. For example, there are over eighty named parts of the human body and many of these have two or more alternative names. In classifying these parts, the Yolnu divide the body into a number of major sections, (head, chest, stomach, legs, arms) and each of these is then further subdivided into their various parts. Where there is a perceived analogy between the human body and the structural parts of a natural species, the analogous parts are usually given the same names. Nevertheless there is considerable vocabulary which is species specific, and some which is applied only to a group of related species.

One example of the analogy drawn between human body parts and parts of other species is found in the application of body part names to parts of trees. Some of these are shown in figure 5:9. However there are other named parts of trees which are quite distinct from any analogy to the human body. For example, wurrki (flower), dhaparmarr (roots which are exposed or growing above the ground), and merrku (small twigs or branches).
<table>
<thead>
<tr>
<th>Name</th>
<th>Body Part</th>
<th>Part of Tree</th>
</tr>
</thead>
<tbody>
<tr>
<td>makarr</td>
<td>thigh</td>
<td>main below-ground roots</td>
</tr>
<tr>
<td>rumbal</td>
<td>trunk/body</td>
<td>main trunk of tree</td>
</tr>
<tr>
<td>wana</td>
<td>arm</td>
<td>branches</td>
</tr>
<tr>
<td>marra</td>
<td>hair</td>
<td>leaves</td>
</tr>
<tr>
<td>gurrkurr</td>
<td>veins</td>
<td>secondary below-ground roots</td>
</tr>
<tr>
<td>dhakal</td>
<td>cheek</td>
<td>fruit or seed pods</td>
</tr>
<tr>
<td>manutji</td>
<td>eye</td>
<td>seeds</td>
</tr>
<tr>
<td>barrwan</td>
<td>skin</td>
<td>bark</td>
</tr>
</tbody>
</table>

Figure 5:9. Analogous names for human body and tree parts.

Some anatomical terms have a very wide usage, in particular rumbal (trunk/body) and manutji (eye). Rumbal is not only the trunk of a tree, but the trunk or body of all types of animals, birds, fish, reptiles and even shellfish. It is also the main root of a yam, and appears to refer to the body without appendages. Manutji is the eye of all biological specimens which have eyes, the operculum of shellfish, the hole made in the sand by some shellfish and also the seeds or nuts of plants. Wambal or yagara (tail) is a common feature of all the above named animals and also refers to the climbing stems of root foods. Naraka (bones) refers to the hard skeletal remains of all animals, the shells of shellfish and crustaceans and sometimes also the wood of dead trees.

Particular groups of species are perceived to have specific named body parts in common. For example fish have djimi (Dorsal fins), binbin (scales), budidi (gills) and wuduy (pelvic and anal fins), while all birds have binbarr (wings) and bulpul (feathers) and some have a gungun (crest).
In contrast to this generalised type of anatomical term, there are many names which apply only to one part of a single species. In particular, many fruits and flowers have separate names distinct from the name of the plant on which they occur. For example ḍhīluk is the fruit of gunga (pandanus), though the general name for fruit is dhakal, and wākwak is the flower of dirrpu (a water lily) though the general name for flower is wurrki.

Figure 5:10, illustrates the structure of the relation between a tree and its anatomical parts. The significance of this structure is that it is fundamental to the notion that any classification can be divided into a number of recognisable parts, being based on the perception of discernably different units within an item. In this case, the notion has been applied to anatomical parts, but the same idea is reflected at other levels of the classificatory system. This anatomical structure I distinguish from the taxonomic structure in that each appears complementary to the other, the former being based on the discernment of difference, the latter on the discernment of similarities.
In examining classifications related to maturity/size, I did not discover any way of separating the two attributes and it would appear that the Yolnu consider them simultaneously. The contrast between this system and the preceding intraspecific ones is that they were applied to separate elements within a species, while maturity/size classifications are applied to a single specimen.

The most complete lexicon of terms that I have yet discovered for different sized specimens is that applied to the various turtle species. As I was given the different names I was also given a description of the comparative sizes of the different specimens. This was made in relation to the number of men needed to carry a turtle from the boat to the cooking place. This relationship is shown in figure 5:11. Of greater

<table>
<thead>
<tr>
<th>4 or 5 men</th>
<th>2 or 3 men</th>
<th>1 man</th>
<th>tiny</th>
</tr>
</thead>
<tbody>
<tr>
<td>dhalwatpu</td>
<td>rrew</td>
<td>walangu</td>
<td>walangu</td>
</tr>
<tr>
<td>(Chelonia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mydas)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>garriwa</td>
<td></td>
<td>daytay</td>
<td>bandamirr</td>
</tr>
<tr>
<td>(Chelonia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>depressa)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>birrgarr</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lepidochelys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>olivacea)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>guwarrtji</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Eretmochelys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>imbricata)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gärun</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Caretta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>caretta)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 5:11.** Identifications of different sized turtle specimens, size being expressed as the number of men required to carry one.
significance however for structural analysis is the fact that in each of the species where immature specimens are named, there are perceived to be three stages of maturity. These three stages, as can be seen from the figure are relative to each other within a single species and not relative to their overall size.

I did not discover a lexically marked discrimination between the sexes of the emu (wurrpâñ), but there are separate names for the stripey chicken (gadarrkadârr) and for the immature bird (marrwawul) which is described as whistling instead of drumming like an adult. Again there are three marked stages of maturity. There appears to be a tendency to observe and label stages of maturity among the plants also. This was noted particularly with plants which have a cyclical availability of their edible parts.

One plant with an edible root (Gardenia megasperma) has three different names for different stages of maturity. A specimen with very small leaves is called dhunguruk, one with middle sized leaves is djalpinyju, and one with old leaves and a very big root is dilkurrugu. Warraga the cycad palm (Cycas media) has a fruit which used to provide the only carbohydrate food available in any quantity at one particular time of the year. Three stages of maturity of the fruit on the plant are recognised and named, then after it has fallen to the ground, three stages of the fruit's transformation into a plant are also recognised and named.

In each of the preceding examples there are three stages of maturity/size observed. In addition to this there is a constant relation between these stages in that the first named or smallest specimen is immature, the second is considered as mature and the third or largest
seems to represent the notion of ideal or absolute maturity. In the stages of the above mentioned cycad fruit these three stages apply to each of the two different phases of its existence. The three part classification's structure can be illustrated as in figure 5:12, which uses the stages of the green turtle as an example.

![Figure 5:12. Relations between maturity/size classifications](image)

The Yolnu extend these maturity/size observations in relation to their metaphysical perspective. First there is the notion that there is a pre-existent stage for each species. This notion is supported by their observations of developments from the eggs of turtles and birds, the seeds of plants such as the cycad and the coconut, and the embryo of various marsupials. Secondly there is the normal physical form of the species as discussed above. Finally there is a further stage which, while not being lexically marked is commonly referred to. This is observed particularly in the larger species of animals and turtles, but also in some of the smaller ones, in trees and in some vegetable food species also. An abnormally large animal may be either killed in the hunt, or may approach a man or group of people without showing the normal fear of man, or a woman may dig up an unusually large yam. Such an occurrence is instantly recognised as not normal and the specimen as something more than normal. It will be considered that the specimen has been transformed in some way such that the specimen has become the embodiment of a human spirit or is actually the transformation of a
human spirit. Various interpretations appear to be possible as to what this beyond-the-natural specimen is. It may be considered as the spirit of a child coming to its parent(s) thus indicating that the wife is or will become pregnant. If there has been a recent death it may be thought of as a visit from the deceased in which case the animal may be spoken to and even offered food. In addition to these occasional experiences there are abnormally large trees known to exist permanently in various places throughout Arnhem Land. I have been shown such trees in the Wessel Islands and Keen (1978:163) also reports them in other parts. These are perceived to be not only trees of a particular species, but to be transformations of the creation ancestors or to be associated with some artifact or action of theirs.

It is in these ways that the Yolnu are able to approach the phenomena around them from a metaphysical perspective and make a second three part classification of the species as in figure 5:13. In this system the first stage is seen as one of pre-existence, the second as physical existence, and the third as in some way supernatural or transformed and thus representing the ultimate existence.

Figure 5:13. Observed stages of a species "x" from a metaphysical approach.
The Classification of Naturally Alive Things into Categories.

In forming the hundreds of natural species into groups, the Yolnu have established a number of different classificatory systems. Each of these is based on the selection of a different set of attributes from which discriminations of similarity and difference may be drawn. I discuss the systems established on three different bases, life-form, function and habitat, and attempt to show the structures of each and some of the relations between them.

The first system of classifications corresponds to what Berlin et al. (1973) describe as "life-form taxa". That is, the species are grouped together on the basis of perceived similarities in the type or quality of existence or life-form. The second system groups items on the basis of their function, or the use which is made of them. A variety of such potential functions are listed such as, foods, medicines, implements and others. I have linked these together under the category of "use" classes for the purpose of discussion. The third system links together species found in the same ecological habitat.

2:ii.a. Life-form Classes.

The Yolnu universally distinguish nine life-form classes as follows;

1: dharpa, plants with definite stems,
2: mulmu, plants without a definite stem,
3: warrakan, includes all animals, birds and reptiles with the exception of the next two taxa,
4: bāpi, all snakes, legless lizards and worms,
5: miyapunu, marine turtles and marine mammals
6: maranydjalk, stingrays and sharks,
7: guya, fish,
8: maypal, shellfish, crustaceans and some insect larvae,
9: guku, native bees and bee products.

In addition to these nine, many people will also add some or all of another four classes, usually naming the class by the name of one common member of it. These additional classes are:

10: galkal, ants,
11: gundirr, varieties of mound producing termites / their mounds,
12: wurrulul, flies and perhaps some other flying insects,
13: garkman, frogs.

There are a number of other species which appear to be ungrouped in any way, and to be known by their species name only. For example, centipedes, spiders, trepang, sea urchins, and insects other than those included in classes 9 to 12 above. A number of whole groups of insects are known by single terms only. That is, there is one term for each of; cicadas, grasshoppers, fleas and lice, butterflies and moths, mosquitos, and sandflies. Some groups of insects are separated into distinct species without being seen as belonging to groups in any way. For example there are several different named species of wasps. For the Yolnu who do not recognise any or all of the last four of the life-form classes, the members of those classes also join the large number of ungrouped separate species.

Only four of the life-form classes are genuinely divided into sub-classes at a level equivalent to that discussed by Berlin et al. (1973) as "generic taxa". These are warrakan, miyapunu, maranydjalk and maypal. To subdivide the other classes the Yolnu make use of "use" or "locality" categories, I have omitted them here as they are not established on the same basis. Warrakan, as a class, is divided into three sub-classes on
the basis of the style of movement. These are;

- **warrakan butthunamirr**: those having flight. That is, bats, birds that fly, and possums that glide.
- **warrakan marrtjinyamirr**: those having upright movement. That is, the remaining land animals and the emu but not the echidna.
- **warrakan gal'yunamirr**: those that drag. That is, lizards, goannas, goannas, crocodiles, tortoises and the echidna.

**Miyapunu**, as a class is divided into two sub-classes. These are;

- **ŋarakamirr miyapunu**: those having shells. That is, turtles.
- **balawalamirr miyapunu**: those having twin horizontal flukes on tails. That is, dolphins, dugong, and whales.

Alternatively this sub-class is named, **yanaramirr** (having tails) or **barrwamirr** (having skin).

**Maranydjalk**, as a class is divided into two sub-classes. These are;

- **maranydjalk**: stingrays, mäna: sharks

**Maypal**, as a class is also divided into two sub-classes. These are;

- **maypal**: molluscs and some insect larvae
dhungalmirr/gorgmirr maypal: those having hands. That is crabs, shrimps and crayfish.

These sub-classes, apart from those of **maranydjalk**, are obviously labelled with descriptive terms. Nevertheless they can be described in Berlin et al. terms as secondary lexemes. They suggest (page 218) that the fact that they are not primary terms does not prevent them from being used as generic taxa. The fact that they are so obviously descriptive in derivation not detracting from their use at this particular taxonomic level to identify an otherwise unlabelled grouping which has been made.
The structure used in these classifications is represented in figure 5:14. In this there are nine obligatory classes (some of which have sub-classes) and a number of optional classes ($n = 0$ to $4$). The system is apparently open-ended with the potential existing for the inclusion of still further classes were this to be considered relevant. In the figure "s" represents "species of any quantity," and "x" represents ungrouped species.

![Diagram](image)

Figure 5:14. Structure of classifications of Life-form categories.

Where additional species are grouped into new life-form classes, these appear to be taken from the ungrouped species. There appears to be potential for extension at three levels. Previously unnamed species (such as imported trees) may be incorporated in groups, or be left among ungrouped species, new sub-groups may be formed within classes and new classes may be established.

2:ii.b. Use Classes.

The second system of classification, that of grouping things according to similarity of use or function produces a potentially unlimited variety of categories. The Yolnu label some of these with what Berlin et al. (1973) would consider as primary lexemes, and others
with descriptive terms which the same authors would categorise as secondary lexemes. Still other classes have their foundation in the Yolnu discussions of their function, and are simply labelled with a description which explains their use.

In the largest of the use classes, maranhu (food), there is repetition of much of the terminology used in labelling the life-form classes. This use of them as sub-categories of food causes some alteration in their meanings. "Food" is divided into two major sub-classes, gonyil (meat foods) and murnyaŋ (non-meat foods). Each of these is then further subdivided into a number of smaller categories. Thus murnyaŋ (non-meat foods) as a class, is subdivided into borum (edible fruits), guku (bee products), jatha (root foods and the growth centres of palms) and manutji jatha (nuts and edible seeds). Gonyil (meat foods) as a class is subdivided into warrakan (animal, bird and land reptile flesh), miyapunu (marine turtle, dolphin and dugong flesh), guya (fish), maypal (shellfish), maranydjalk (flesh of only those stingrays and sharks considered edible), and mapu (eggs). Some of these categories of gonyil (meat foods) are then subdivided further with the same categories as discussed under existence classes. One important exception to this is that those snakes which are considered as edible are included as a sub-category of warrakan, that is, warrakan djuryunamirr (those that slide). In diagrammatic form, the relations between the classes and sub-classes of food can be considered to be as shown in figure 5:15.

A second lexically recognised "use" class, one without any sub-classes is man'tjarr. Man'tjarr are small leafy branches of a specific group of trees. These are held in a fire until scorching and then used to drive away from a living person or an object, the influence of a person who has recently died.
In addition to the traditionally established "use" classes, potential exists for the development and lexical recognition of new ones. I noted two examples of this, both of which are labelled with terms derived from English words. In each case the meaning of the English word has been changed with its adaptation to a new use. The first of these, **guluw** is not used by all Yolnu, but was used by a number of craft workers to classify all varieties of adhesives and caulking substances. It included the sap of two trees and the juice of the dendrobium orchid.
bulb. Other things included were the dark wax from the native bees, and such modern substances as; PVA woodworking glue, two-part epoxy resins, caulking compounds, and common liquid gum.

The second of the newly established "use" classes mirritjin\(^\text{19}\) (chemical) appears to include all things which have a useable chemical property. It includes all plants used because of their medicinal properties, together with those plant and animal materials used as fish poisons.\(^\text{20}\) Those Yolnu developing agricultural skills use the class to include chemical sprays and fertilizers, and the hygiene workers include disinfectants. Sub-classes of mirritjin are developed by using either the name of the sickness/injury to be treated with a particular group of items, or the purpose for which the item is to be used, with the addition of the suffix -puy.\(^\text{21}\) For example, where a particular item is used for poisoning/stunning fish, it may be described as:

\[
\text{muyunu gayi, mirritjin guyapuy.}
\]

\[
\text{muyunu it, chemical fish for the purpose of.}
\]

That is, "It's muyunu, a fish poison.

While such subdivisions are not lexically marked, they have a definite function in the structure of the classificatory system, and are treated as definite subclassifications.

There are many other sets of items established as groups on the basis of their common function or use. The Yolnu identify these groupings with descriptive terms. These are developed by adding the suffix -wu, (for the purpose of / for) to the name of the thing that the set of items is used to produce. For example, a group of tree species which can be used in the production of gara (spears) can be classified as garaw (for spears, or for making spears). In this way the Yolnu are able to establish classes in relation to any purpose at all. Thus while there
are a restricted number of lexically recognised "use" classes, the potential for establishing such groupings under secondary lexemes is almost limitless.

The structures of the different "use" classes range from the relatively simple ones of figure 5:16, to the more complex one of the food classes shown in figure 5:17. Of the classes with the simpler
structures, only one (man'tjarr) appears to have a fixed number of species. In all the others it appears that there is potential for the inclusion of any new or additional items which may be relevant. It appears also that some of these "use" classes may function at a level other than that of subdivisions of "naturally alive" things, though I have included them in this general discussion.

2:ii.c. Locality Classes.

The division of species into groups on the basis of a common environmental habitat has been developed into a third and completely different system of descriptive classifications. While these divisions are descriptive ones, they identify definite classifications. They then match the notion of secondary lexemes discussed by Berlin et al (1973:218) as I mentioned earlier in relation to life-form classifications.

The names of the locality classifications are developed by adding the suffix -puy (belonging to/ associated with) to the names of the localities in which items occur. Thus if a species is perceived as characteristically being found in association with gathul (mangroves), it would then be described as gathulpuy (belonging to/associated with mangroves). By applying the same suffix to each of the other major environmental divisions, there is then established a set of descriptive classes and sub-classes to which all "naturally alive" species can be allocated.

The degree of subdivision into categories and sub-categories varies from habitat to habitat. It also varies according to the type of item being classified. For example, one of the fishermen, in listing
off the names of the fish, (guya) did so in locality groups using the different classes as memory aids. In this way he divided the species into into five classes according to the recognised fish habitats. The classifications that he used were;

- **garrwarpuy guya**: fish that live near the surface,
- **goypuy guya**: fish that live near the bottom,
- **gundapuy guya**: fish that live among rocks and reefs,
- **mayanbuy guya**: fish that live in the rivers,
- **raypinybuy guya**: fish that live in fresh water.

The structure used in this classification is as shown in figure 5:18.b.

The most intense use of subdivision that I was shown was in the groupings of sixty-six different species of maypal (molluscs, crustaceans and certain insect larvae). Ten separate localities were specified and of these three were further sub-divided. These were;

- **gundapuy maypal** (those associated with rocks and reefs) which were divided into four groups,
- **munathawuy maypal** (those associated with sandy beaches) of which there were two sub-groups, and
- **gathulpuy maypal** (those belonging to the mangroves) which were further divided into eight smaller categories. The structure of these classifications and their various subdivisions can then be considered as outlined in figure 5:18.a.

The uses of the location classes can be distinguished as being of two distinct types. The first type is that shown in figure 5:19, in which all different types of species of living things are class together according to the environment in which they are habitually
Figure 5:18. Structures used in grouping members of a particular life-form by means of categories of habitat.

located. The second type is that shown in figure 5:18.a and b, where particular life-form or food classes are divided into sub-categories according to environmental groupings.
2:ii.d. Problems associated with relations between systems.

There are problems for analysis in the relations between the terms used in the life-form and food classes. The first of these relates to the fact that while the Yolnu use quite different terms for the grouping of plant species into life-form and food categories, there is considerable overlap in the terms used for the non-plant species. All the items listed as primary classes of meat foods have the same names as a number of the life-form classes. It appears at first that they should be analysed as belonging either to life-form or to food categories, but not to both. However the Yolnu choose to use them in both systems, and overlap their usage to such an extent that it is frequently difficult for the external observer to differentiate between the
alternative meanings. It is in fact the separate terminology used for the plant species which gives the most indisputable indication that the two systems are distinct. In both systems non-plant terms are treated as on the same level as, and contrastive with, the particular terms applied to plants. This I take as evidence to support my analysing the non-plant terms as being used with different meanings in the two domains. That is, in one domain they refer to the animal species, and in the other to the meat of the species.

The second problem for analysis relates to the sub-class level categories, and whether they should be assigned as life-form sub-classes or food sub-classes or both. *Warrakan marrtjinyamirr* (animals having upright movement) is a category difficult to assign definitely as a food and not as a life-form category. Both dog and horse are included in the category while it is known that they can be eaten and that they have been in the past, both are considered to be non-food. This would appear to give some limited support to an argument in favour of assigning the style of movement categories as life-form sub-classifications.

In contrast to this, the classifications of snakes and snake-like things would appear to give support to the opposite argument. All snakes are fitted into the life-form class of *bäpi* (snakes and snake-like things) and not the life-form class of *warrakan* (animals). When the same group of species is considered from the aspect of food classes a division is formed between edible and inedible species. When this is done the inedible species appear to be consistently labelled *bäpi*, and the meaning of the term then changes to "inedible snakes". This contrasts with the treatment of the edible species which are then called *warrakan djuryunamirr* (animals that slide). Then we find a movement based classification functioning as a food sub-classification. I have
chosen simply to indicate that this problem exists rather than attempting to conclusively solve it. For the purposes of my analysis of the systems of classification and sub-classification, it does not effect the results whether these are subclassifications of food or of existence classes. What is of significance is the fact that sub-classifications are formed within some classes.

In each of the three different systems used in grouping species, the structures used appear to be variations established on a single taxonomic framework. That is a framework where separate items are linked together in a single category on the basis of perceived similarities. This underlying framework facilitates a dynamic system which enables variation to the basic structure in three ways. First there appears to be no limit to the number of items which can be included in a category, except for the limits imposed by the attributes of the category and no restriction on new items being added to a category. Secondly there is the potential in the underlying framework for the grouping of lower level classes into higher level ones, in a continuing process which allows for at least five levels of class and sub-class. Thirdly, at all levels of the taxonomic hierarchy there is open-endedness as to the quantity of items which may be included in a category.

2:iii. Variation in classifications within the category of "Naturally Alive" things.

Wide variation occurs from person to person in the knowledge of and application of the classificatory systems applicable to living things. These variations were observed at most levels of the system, from the identification and classification of individual species to higher levels
of the system, and this extended into variations within the structures at the higher levels. It occurred more frequently where the items under discussion were not common, or where the categories involved were not of significant importance to the particular individuals.28

A range of factors appears to contribute to the variations at all levels. Where possible I attempted to eliminate some of these in the original stages of research, but it became apparent that if I was to discover the deeper levels of structure, I would have to recognise that part of those structures would be the facility to incorporate both variation and change. Thus I encountered variation which I considered due to differences in experience such as were generated by age differences, by the sexual division of labour, and by differences in domicile such as the contrast between the coastal people and those from the more inland regions of Arnhem Land.

An example of the types of variation in the classifications made at species level comes from attempts to record identifications of the different species of shellfish. I used a collection of seashells to ask about their identity, first as foods or non-foods, and secondly as specifically named items. The women asked were mostly from coastal groups and reasonably similar in terms of their experience and of their contact with shellfish. While there was enough consistency amongst their responses for me to be able to assign names to most of the specimens, there was a wide range of variation. There were a number of specimens where edibility was claimed by some and denied by others. In addition while there were a number of specimens of the more common species given the same name by all the women, showing a core of agreement, there was a tendency among about a third of them to link several morphologically similar species under a single name, often the name of
the commonest of the shells in the particular set. In this it appeared that the naming of particular species was neither of significance or interest to some women nor would it detract from their ability to gather adequate supplies of shellfish to feed their families.

Variations of the above types occurred at species levels in all the life-form classes. There was also, as mentioned earlier, variation from person to person as to the actual number of life-form classes that were recognised. This applied only to what might be called fringe classes after the universally acknowledged core of classes had been named. Thus it was the inclusion of the fringe classes of "ants", "frogs", "termites" and "flies" which varied from individual to individual.

In the sub-classifications of non-meat foods there appeared to be an alternative available between two generally accepted structural variants. The simplest structure was that which I have outlined in the section on food classes, the relevant section of which is shown in figure 5:20.a. This contrasts with the alternative structure shown in figure 5:20.b. While the variations are only minor they are consistently used and serve to illustrate that within the deeper level structures

<table>
<thead>
<tr>
<th>Structure a.</th>
<th>borum (fruit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>guku (bee products)</td>
</tr>
<tr>
<td>murnyaj (non-meats)</td>
<td>natha (root vegetables)</td>
</tr>
<tr>
<td></td>
<td>manutji natha (seeds and nuts)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure b.</th>
<th>borum (fruit)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>guku (bee products)</td>
</tr>
<tr>
<td>murnyaj (non-meats)</td>
<td>natha (root vegetables)</td>
</tr>
<tr>
<td>natha (vegetable foods)</td>
<td>manutji natha (seeds and nuts)</td>
</tr>
</tbody>
</table>

Figure 5:20. Comparison of variations in Classifying Non-meat Foods.
there is potential for the accommodation of variation in the surface level structures and for the acceptance of variation as normal.

The differences between the two systems are entirely dependent on the variations in meaning applied to the word ḫatha. In "Structure a" of figure 20, the word is used exclusively to apply to all root vegetables and only to them. In "Structure b" the word can be contrasted with fruit, and with bee products, while including seeds and nuts so that its reference is to starchy vegetable foods. The two alternative structures do not appear to be consciously distinguished. I have outlined them that way to emphasise the potential for variation which is available within what is really one system.

Conclusions.

In the preceding sections of this chapter, I have discussed three distinct classificatory systems, each discernible as such on the basis that it has been shown to use a fundamentally different structure from the others. One of these systems is concerned with the organisation of items into groups on the basis of perceived similarities. The structure employed in this classificatory process, I have discussed as being "taxonomic". The second system appears complementary to it in that it commences with a single entity and classifies its various parts on the basis of discriminable differences. I have referred to that structure as "anatomical". Thirdly there is a system of classification applied to different expressions of a single quality or entity. This system has been shown to consistently use a three part structure.

In addition to these three structures there is perceived in each of the three systems a fourth set of structures concerned with relations
between pairs of items or qualities. These have taken the structure of oppositions, though I will briefly show that these are not all of the same kind. Finally it has been shown that the meanings of classifications can be influenced by whether the Yolnu are or are not consciously applying metaphysical considerations in their use.

In establishing the category of structures termed "taxonomic", I have linked together a variety of structures, which appear to be founded on a common notion. That is, each structure is composed of a number of items on one level, grouped into one or more higher level categories on the basis of some perceived similarity. The notion can be demonstrated in the simplest structures such as shown in figure 5:16, or in more complex multi-level ones such as shown in figures 5:14 and 5:17. The structure of the classification of life form categories as shown in figure 5:14, would appear to agree with the suggestions of Berlin et al. (1973:240). They claim that "there are at least five, perhaps six, taxonomic ethnobiological categories which appear to be highly general if not universal in folk biological science". However in searching for a cognitive level of taxonomic structure, I have had to pursue the analysis of structures to a different analytical level. To do this it has been necessary to consider more classificatory systems than the one applied to life forms and to include both classifications of varying depths and the potential for variation within each level of them.

The classifications of species have the semblance of rigidity but as I have shown, they are open to considerable variation. Any new item can be fitted into the system, as a number of exotic plants and animals have been. Similarly, whole new classes and categories can be added or old categories removed or lost without the system itself
failing, as I have shown. The Yolnu attitude to this is very neatly
summed up by one Yolnu man when speaking of someone's attempt to
distinguish between two items not previously separated. "Well we can
try, for new generations to get words for these. I think words often
get left out. Yolnu used to speak lots of matha (words) but every
time some old person dies we lose a lot of words."

In this statement and the juxtaposition of the thoughts
expressed, is an indication of the Yolnu metaphysical notion that
anything "new" is not really new, rather it is the re-expression of
something that has existence but which may have been for some time
unexpressed.

A number of problems are raised by the suggestion of a
"taxonomic" structure. Firstly, is there such a thing as a fundamental
taxonomic structure or is it just an artifice of the external
observer? Secondly, are the various "taxonomic" structures discussed
variations of this fundamental structure, variations of each other,
or totally independent? Finally, if there is such a structure, what is
it, and how is it able to incorporate variation and change? These
problems will be considered in the next chapter in relation to the
comparison of structures of the classifications of living and
existing things with the classifications considered in the three
preceding chapters.

The second category of structures that I have established, the
"anatomical" structure is related to the "taxonomic" structure as I
mentioned earlier in that it appears to be established by a
complementary process. When the two are illustrated in diagrams, the
visual pattern gives the impression that they are identical. However
the "anatomical" structure (figure 5:10) appears to be developed on
the basis of the discrimination of differences in contrast to the
"taxonomic" one which appears to be established on the basis of the
discernment of similarities. Thus the process of establishing them
appears to proceed in opposite directions. It is upon this contrast
that I have relied in distinguishing between them as in each there is
a relationship between items grouped in single categories.

Metaphysical considerations related to the "anatomical"
structures enable the perception of particular relations between
anatomical elements of different entities. The perception of an
analogous relation between these structural elements of different
items has been demonstrated in the use of a single term for the
related parts. While the relation between such items may be treated
as analogous or even as one being symbolic of the other, it appears
possible that the Yolnu metaphysic enables a perception in which each
of the items with the one name is seen to express something of the
nature of the other.

The third structure discussed was that consistently made up of
three evaluative categories which I have simply referred to as the
"three part" classification. It was shown that this structure can be
used as a frame for classifying either the quality of life exhibited
in a range of different things, or the stages of maturity in single
entities. In each case it was shown that the three classifications
used were relative, both to each other and to some ideal expression
of the quality or the entity that they evaluate. The first of the
three was shown to be equivalent to a pre- or partial expression of
the ideal, the second, a generalised expression of it, and the third
to be the ideal itself. These three basic classifications were shown
to be applied to physical attributes when the ideal was a physical quality or entity.

When the items being classified were considered from a metaphysical, instead of a physical approach, a second three part structure was shown to be superimposed over the first. When this was done, the "ideal" classification was seen as in some way a spiritual transformation of the physical entity or quality. The generalised or second classification was then applied to the physical entity or quality, and the first classification of the three to any item which can be perceived as a pre-existent or an incomplete expression of the ideal.

The fourth structure, that concerned with the relation between pairs of items or qualities has been presented in the data in a number of places. In the discussion of life and existence categories, there was shown to be a basic dichotomy between things which were considered to have physical life and those considered to be without that life. Similarly a dichotomy exists between those things having physical life and those having spiritual life.

Throughout the range of paired items certain elements can be isolated as common. First there is a basic "binary" opposition in which the two elements of a pair are related through the possession or non-possession of a particular quality. Secondly in this paired relationship the focus is on the quality of one of the paired elements. The second element of the pair is then considered as having or expressing the contradictory quality to the focal element, Thirdly the relationship is considered as being between the attributes or qualities themselves and not between the items.
When the paired relations are considered from a metaphysical approach, it is again the attributes or qualities that are being contrasted, but the focus is on spiritual or supernatural attributes or qualities. When change is seen to occur, the Yolnu, by using this focus, are able to consider the change as occurring in the quality being evaluated and not in the item expressing it. In this way they are able to consider the item itself as being unchanged.

In the discussion of these different systems and structures a variety of problems is raised. Some of these were outlined in relation to the "taxonomic" structure. There are problems in the relations between "taxonomic" and "anatomical" structures and in the relations between "physical" and "metaphysical" approaches. There are also problems associated with the nature of oppositions and their perceptions from the different Yolnu approaches. These and other associated issues I will discuss in relation to "cognitive" structures in the next chapter.

NOTES

1: It is interesting to note that none of the many people who discussed these categories mentioned either blood or body juices as an indication of life.

2: Dogs in the camp all have their kin terms, and their relationships to one another are known. However it is noted that they do not keep the appropriate laws and copulate with their sisters and mothers-in-law. This is a source of much hilarity, proof that they don't keep laws, and therefore are not in the same class as humans.

3: One man gave this as the reason that it was right to eat animals and plants for food but not right to eat humans.
4: I did not obtain statements to the effect that these were "alive" but it appears certain that they are considered to embody the life of the creative being.

5: In the contrast between Yolnu categories and English ones, there are serious implications for such studies as Nurcombe (1973:109-112). The assessments made of children's responses may have been quite different in his study if the culturally correct answers had been considered.

6: There is no complete agreement amongst the Yolnu about these two names. Some claim them to be two names for one species, others that they are definitely distinct.

7: The original drawings for figures 5:5.a, and 5:5.b, were done for me to use as illustrations in a literacy programme. I was attempting to obtain the response of the life-form term miyapunu (turtle), in response to them. In every case, the older men responded to them with the precise species name. Not until I drew a composite picture (figure 5:5.c) combining the features of several drawings was I able to get the response I sought.

8: I was not able to obtain scientific classifications of these larvae, but for the purpose of their inclusion in this section, this is not significant.

9: Schebeck (1978:169-177) discusses a wide range of Yolnu names for body parts and their alternative uses, with specific reference to one of the Dhaqu dialects. Some of these terms differ slightly in use in the Elcho Island region.

10: Two of the three stages of the fruit on the plant were named with descriptive terms, while the three stages on the ground were lexically marked. The names appear to be known by very few senior people. I did not discover whether the names were part of the restricted body of ritual terms or whether their use is dying out...
with the replacement of the use of warraga by wheaten flour.

11: The descriptions I was given of such occurrences were often ambiguous, and I am not certain whether the Yolnu were making a distinction between the two alternatives or not.

12: The use of a variety of terms for the sub-groups of miyapunu lends support to the argument that in spite of the fact that these are descriptive terms, they are definite categories as far as the Yolnu are concerned.

13: Species used for man'tjarr are; gawatjark (Drypetes lasicogyna), gaypal (Acacia auriculiformis), gadayka (Eucalyptus tetrodonta), and maypiny (Erythrophleum chlorostachys).

14: By using the scorched leaves in a sweeping action over a person or object they are "made free". The action is not considered effective unless carried out with the leafy branches of this specific group of plants.

15: In this context, a specimen of the "naturally alive" class which is considered as inedible is classified by the term nhincerely, meaning "useless as food" or "not belonging to this class". An item classified in this way is considered to have the outward appearance of food in a way that is contrary to fact. The term thus acts structurally as an opposition to the category "food".

16: This word has been developed from the English word glue, perhaps with the addition of the suffix -wu (for the purpose of) (see note 22)

17: The two trees are mupan (Terminalia carpentariae) and maypiny (Erythrophleum chlorostachys).

18: The orchid is djalkurrk (Dendrobium dicuphum)

19: Mirritjin, a derivative of "medicin" covers a wider concept than the original English word.
20: Examples of animal materials are a species of sea slug and possibly also soft coral.

21: There is a range of forms of this suffix as -buy, -puy, -wuy, (see Lowe N.D. Lesson 39).

22: There is also a range of forms for this suffix as -wu, -w, -wa, -gu, and -ku, (see Lowe N.D. Lesson 13).

23: Similar species used as fibres for raki (string) or for bathi (baskets) can be grouped in accordance with their use for rakīw (used for making string) or bathīw (used for making baskets).

24: This is based on the fact that certain commercial items of unknown origin and some "non-living" items are able to be included.

25: See Note 21 above.

26: See Rudder 1979:356-357.

27: See Rudder 1977: Section 2:3.2.4.


29: It appeared that most of this type of variation was related to the degree of personal interest taken by particular women in the accumulation of knowledge.

30: When I attempted to cross-check identifications without identifying my sources of particular names, there were two common types of response. One was a blunt, "Wrong it's ....", and the other was "I don't know that name. Maybe it's a .... name. (naming an adjacent linguistic group). On only rare occasions was an admission of incomplete knowledge made.

31: Berlin et al. (1973) include intraspecific levels of "variants" within species in their hypothesis of a universal depth to taxonomy. I have described these separately, but the Yolnu facts coincide to a reasonable degree with the hypothesis.
CHAPTER 6.

COGNITIVE STRUCTURES.

In the preceding ethnographic chapters, I have examined various aspects of Yolnu classifications and evaluations. I have discussed the classifications of a wide range of items and properties, and the evaluations of these in relation to notions of their identities. In doing this I have demonstrated that there are a number of structures used, both independently and in conjunction with each other, in making the classifications and evaluations. At this point I draw together the patterns of the various structures discussed and attempt to demonstrate that the surface structures as used in the various domains are indicative of underlying cognitive structures.

There have been four kinds of commonly occurring structures in the data thus far discussed. These I have labelled as taxonomic structures, anatomical structures, three-part structures and the structures of paired relations. I discuss each of these separately, attempting in doing so, to examine those notions about the world and its composition which are relevant to each.

1: Taxonomic structures.

In three of the four preceding chapters, I have isolated structures in which items were linked together into sets, each of which was perceived by the Yolnu, to be formed on the basis of features held in common. In Chapter Two I showed that there were a number of domains in which there could be identified groups of attributes linked
together under a single category. For example, there were shown to be sets of similar terms linked together in classes under each of the categories, smooth, rough, weak and cold. These terms within each category were not synonymous with either the category into which they were gathered or with each other. In Chapter Four, it was argued that each of the colour terms was treated as if it was on the same classificatory level as each of the others. These then were considered as being able to be linked under the single category of "colour", again demonstrating the grouping of items into sets on the basis of perceived similarity.

In relation to the classifications of living and existing things, I showed in Chapter Five how the Yolnu group items at a number of different levels of inclusion. These ranged from intraspecific classifications of species, (at the levels of greatest specificity) to the grouping of higher level categories (at the level of greatest generalisation) to form the "unique beginner" categories. At each level these categories were established by means of perceived similarities in their life form. In addition I have shown that the same items can be grouped differently if the basis of perceived similarity is changed from "life form" to "use" or "function". Further, that there can be different uses or functions such as food, medicine, or ceremonial, each of which forms a different basis for the observation of similarity and the establishment of categories. Thus it is possible to show that grouping of items into categories on the basis of similarity is a feature of Yolnu classifications which is found in a wide range of applications.
In the preceding chapter I raised the question as to whether the "taxonomic structure" actually exists. It is my premise that the possibility of identifying the process of classification which groups items on the basis of perceived similarities does in fact indicate its existence. That, if the various factors of the different examples of classifications of this type are examined, it will be possible to isolate the structure as it exists at a cognitive level.

There are certain minimum constraints on the form which such a structure can take. First there must be a minimum of two items having a particular feature in common, less than that being a logical impossibility. Such minimal sets are spread throughout the material presented. For example, the category of "sex" has two members, male and female, and the category "plant" has two members, grass and tree. Secondly, the cognitive structure must function in other domains than that associated with the life-forms of the natural species. I have already shown that this is the case in classifications of various types. I have also demonstrated that the same principle operates at different hierarchical levels of classification. For example, sets of categories such as, animals, fish, crustaceans, and plants are linked in a higher level classification in that they are all categories of "living things". Thus it can be argued that a Yolnu "taxonomic structure" exists at different levels and in different domains with a minimal number of two items included in a higher category. This structure can be illustrated as in figure 6:1.

![Figure 6:1. Minimal taxonomic structure.](image-url)
In this figure "f" represents the common feature in two items, \( \text{i}^{fa} \) and \( \text{i}^{fb} \). "I" represents any item being classified. "a" and "b" represent features not held in common and which establish the separate identities of the two items. \( \text{C}^f \) then represents the category "C" formed on the basis of the common feature "f".

This minimal taxonomic structure is inadequate in that it does not have capacity for the inclusion of variation, two types of which have been described. Firstly there are quantitative variations in the system. That is, the number of items included in different categories on any one level is not consistent. For example, there are five species linked under the category "marine turtles", while there are more than fifty species grouped in the category, "shellfish" and several hundred "flying animals". Similar, though not as diverse, variations are found in the classifications of physical matter.

There are also quantitative variations in the number of hierarchical levels of inclusion through which different species are gathered into the higher level category of "naturally alive" things. For example, there are two intermediate categories in four of the life-form classes, five of the classes have one intermediate category, and there are some separate species which have no intermediate categories and are included directly in the highest level "naturally alive" category without even an intermediate life-form class.

The second type of variation demonstrated is that within single categories. I have shown that this type may be due to a range of factors but that it is a variation not just between classifications made by different individuals but also includes changes in those made
by different individuals over a period of time. For example, some individuals were shown to identify four colours, others five of six, and one identified eight. Similarly different people identified nine, ten eleven or even more life-form classes. In addition to being able to cater for these variations, the cognitive level structure must be open to allow the continuous addition of new items at all levels as they are learned from childhood on.

A further problem exists for the analysis of the cognitive level structure. In a number of the categories I have shown that there is an "obligatory" minimal set of items. Beyond this minimal set there are other items included by some but not considered acceptable for inclusion by all. Each person considers that the ones he or she includes are correct whether they are equivalent to or more than the basic set. That is, there is a notion that appears to be held by every Yolnu, that there is a "correct" set of items which should be included in each category.

The number of "universally accepted" items varies from category to category. In addition to them there is apparently room within the structures for the inclusion of items not previously considered. These then appear after inclusion, to be treated as if they have always existed and have simply not been experienced prior to the point where they are incorporated into a category. This fits with the Yolnu notion that nothing changes. It enables new items to be considered as not new, as always there though not experienced, as existing in a state of pre-recognition or pre-relevance. In this way there is an explanation for the variation from person to person in the number of items included. Those recognised by all are relevant
to all, whereas those only recognised by some are relevant only to them, unless they become more widely accepted.

The Yolnu taxonomic system thus has the potential to produce open-ended classifications, and to enable individuals to vary the numbers of items identified in any category (within certain constraints). In order to allow for this, the model of the underlying cognitive structure must be modified to incorporate both the core distinctions and individual extensions or variations over time.

Figure 6.2. Taxonomic Structure.

In figure 6.2, I have outlined what appears, on the basis of the above constraints and in line with the evidence, to be the shape of the Yolnu "taxonomic structure" at cognitive level. This figure represents an extension of figure 6.1, to incorporate all forms of "obligatory", "optional", "variant" and "potential" requirements. In this figure \[ I^{fa} \] represents the first obligatory item, \[ I^{fn} \] represents further items (whether obligatory or optional) to any number, and \[ I^{f?} \] represents the potential for extension to include any other (variant, optional, or new) item. It is a part of the structure which, rather than being a position which can be filled, operates as a continually open category through which any item, once acknowledged, is automatically transferred to become part of the person's \[ I^{fa} - I^{fn} \] set. In this structure the item \[ I \] represents
any item which may be included in the category whether it is an individual item or a lower level category functioning as an item for inclusion in the next higher category.

This cognitive level structure is compatible with all of the taxonomic structures discussed in earlier chapters. For example, those structures represented by figures 4:19, 5:7, 5:14 or 5:17. It is also capable of variation in any way without losing its fundamental form. Thus it has the potential to be the framework from which any other taxonomic structures are or were generated.

2: Anatomical Structures.

In the preceding chapter I isolated a system of classification which I argued was generated by the notion that an entity could be divided into a number of discrete parts. The structure of this system I labelled as the "anatomical structure". It was shown to be used in the naming of human and animal body parts, and in the discrimination of the various parts of plants. It is also possible to find the notion operative in the identification of particular features of inanimate objects. For example, the edges, outer surfaces, undersides and interior of rocks (Rudder 1977:2:3.4.2.4.). In Schebeck (1978:168 - 177), the data given indicates that the notion is also to be found in the identification of the various elements of the landscape.

In its most simple form the notion results in a structure which may be illustrated as in figure 6:3. Here there is a single entity considered as being able to be divided into a number of elements, all of which are classified as belonging on one level of discrimination.
The structure is not limited to use on a single taxonomic level but is found in more complex arrangements as, for example, in the classification of the parts of the human body. In figure 6:4, a highly abbreviated outline of the body shows the potential for a number of levels of classification. I have not discovered more than the four levels shown here, though there is a much wider use of division within the categories than I have indicated.

In each of the above domains in which the notion of dividing an entity into parts is applied, there is variation. For example, not all Yolnu use the term "body" to include the head and limbs. Some include only the chest and lower trunk. There is also variation in the number of terms known and used in each category. These variations indicate that the structure is not only flexible in width and depth, but flexible in the shape it assumes in any context.

To this point, the examples have all been related to the classification of the elements of physical structures. There is a second somewhat different area in which the notion is applied. This is in the subdivision of categories of ideas. For example, the subdivision of the category, "description of an entity" into the "descriptive domains" which outline its distinguishing features. Thus any specimen (such as a bird or a fish) is described by its features, but the features
themselves belong to a set of descriptive categories such as, colour, life-form, habitat, voice, movement, and these can be considered as subdivisions of the category "description". The structure of the classification used in this example is still based on the notion of an entity being divisible into its parts, but the entity here is an idea, not a concrete object. It is the notion of "description" that is being divided. The structure, as illustrated in figure 6:5, appears to function on a single level. All the elements here form part of the notion, "description".

Figure 6:4. Partial outline of the classification of the parts of the human body.
Assuming that there is a cognitive level structure related to the idea of an entity being divisible into a number of parts, there are a number of constraints that are imposed on its form. First it must have potential for expansion, or it could not be applied in any context where the parts of an item are learned over a period of time. Secondly it must remain continually open-ended in order to allow the discovery or inclusion of previously unrecognised elements. Thirdly, it must be capable of including potential for classification on one or more levels. Figure 6:6 gives an indication of the shape of such a structure, one which will meet all of the above requirements.

In this figure, \( E \) represents the individual entity. \( I \) is then the identifiable element within the individual entity, and \( I^a \) the feature by which the first element is discriminated. \( I^n \) then represents one discriminated element, \( I^n \) represents any number of distinguishable features by which other elements are able to be separated as contrastive at the same level, and \( I^? \) stands for an open space.
This represents the potential for the inclusion of additional items if they become recognised by features which have not previously been distinguished. Any element on one level of division can function as an entity which is then able to be divided into its components.

In diagram form the cognitive level structures of the anatomical and taxonomic types appear very similar to each other. There are however, definite contrasts in the meanings of the elements of the structures, which are related to the notions on which the two different structures are founded.

3: Three-part Structures.

Through all four of the ethnographic chapters one structure is constantly apparent as a framework for evaluation. This is the structure consistently made up of three related classifications. As I have demonstrated with a variety of different materials and situations, each of these classifications is relative to the others and to the context of its use. I have also shown that there appears to be a recognisable quality constantly perceived in each of the classifications in relation to the others with the relation between them being qualitatively assessed.

I have shown that the structure is applied in both pragmatic and metaphysical contexts while also identifying contexts where it appears to be used in a pragmatic sense without any essential implication of the metaphysical. It is my assertion that there is a very strong relationship between the three categories and the Yolnu perception of the nature of existence, and that it appears that the structure is integrated with this perception.
In the earlier discussion of the evaluation of properties of physical matter, I demonstrated that these normally appear to be based on the material properties of the things being analysed. I also demonstrated that such evaluations were made using the three-part structure, with each of the three parts representing a different expression of the quality being evaluated. These were; first, a moderate or partial expression of the quality, secondly a generalised expression of it, and thirdly a more intense or ideal expression of it. The use of this structure was demonstrated in relation to the pragmatic evaluation of most of the properties considered. For example, an item could be seen to moderately express the quality "big", to express the quality "big" in a general way, or to express that quality in a very definite or intense way. When considered this way it can be seen that it is the physical expression of a particular quality which is being evaluated, and not the item itself. This distinction is critical in understanding the evaluations being made.

The same relationship between categories was also argued for in Chapter Three, in the Yolnu approach to the assessment of relationships between items in sets or groups. There were shown to be three distinct ways of classifying these relationships. There was the classification of precise relationships between individual items, of precise relationships between sets of items, and non-precise relationships as perceived in larger groupings of items. In each of these ways of classifying relationships there were three classifications used with each of them in a constant relation to the others. The central classification in each case was shown to express the general characteristics of the quality being evaluated. The first classification was shown to identify a partial or pre-expression of
that quality and the third to demonstrate a qualitative intensity of
the relationship type such that it could be seen as the completion
of, or perfect example of, the type.

Again, in relation to colours and their pragmatic evaluations
a three-part evaluation structure was shown to be used, with each
colour being evaluated in terms of, a moderate expression of its
quality, a general expression of it and an intense expression of it.
Each evaluation of any one colour was shown to be relative to the
other ones of it and to the context in which it was made.

Discussion of the classifications of living and existing things
revealed three different classifications of the quality "physically
alive". Each of these was shown to be in the same constant relationship
with the others that has already been already been described. Similarly
a number of different natural species were recorded as having three
stages of physical life, notably the emu, four species of marine turtles,
turtles, and two plants, one a yam, and the other the cycad tree.

The relation between the structures of the three-part
classifications as used in different domains can be illustrated as
figure 6:7. The constant relation between the categories in each of
the classifications is also clearly seen.

In the discussions of the cycad tree and its classifications, a
second notion associated with the three-part structure was illustrated.
This was the idea that if a quality increases in intensity in some
way beyond the intensity of the ideal for a particular classification,
it can transform in such a way as to enter a different or alternative
### Partial Expression | General Expression | Ideal/Intense Expression
---|---|---
**Size** | moderately big | big | intensely big
**Relationship**
- between items: solitary item | pair | trio
- between sets: solitary set | pair | trio
(almost but not yet a relationship) | (relationship) | (complete or intense relationship)
**Non-Precise Grouping**
moderately non-precise grouping | non-precise grouping | very much non-precise grouping
**Red (or any other colour)**
moderately red | red | very red
**Living Things**
movement and power | breathing and reproducing | having and keeping laws
**Emu**
emu chicken | young bird | mature bird
**Turtles**
hatchling | young turtle | large adult (mature)
**Yam**
small leaf | large leaf | old leaf

Figure 6.7. Comparison of three-part classifications made in different domains.
dimension of that same quality. The tree and its fruit were shown to
go through three stages in its life cycle of these, two and possibly
also the third of these stages were shown to go through three
separate classifications of maturity. In each of the stages or
transformations the essential nature or quality of "cycad" remained
unchanged while the expression of that nature was seen to assume a
different form.

A comparable type of transformation between dimensions occurs
in the classification of relationships between items within groups.
In these a transformation was shown to occur from classification of
precise relationships between items to classifications of precise
relationships between sets of things when the size of the group
went beyond certain limits. Transformation also occurred
between classifications of precise relationships and those of
non-precise relationships. Used in this way the transformation at the
point of greatest intensity enables the Yolnu to have means of
assessing what could appear as a continuum in such a way that the
continuum can be broken into units, each of which can be perceived
as a different expression of a single identity. Thus the continuum
was shown to be removed by classifying it out of a lineal
progression into a repetition of existence in different expressions
of the one quality. The structure of these classifications with their
relation to transformations is shown in figure 6:8. Whether the
transformations formed a cyclical pattern or not they appear to be
transforms between dimensions which are perceived to be in an analogous
or potentially analogous relation to each other.
Figure 6:8.a. Reclassifications of Cycad tree as transformations reach classification of maximum intensity.

Figure 6:8.b. Reclassification of relationships at boundary of classifications of maximum intensity.
In three of the ethnographic chapters (two, four and five) I have shown that the Yolnu also superimpose a metaphysical three-part evaluation over the pragmatic one. These metaphysical evaluations clearly express the notions that entities, properties or qualities which exist in the physical dimension also have a spiritual existence, that there are transformations from one to the other, and that the spiritual existence is both the ultimate reality and the source of the physical.

The quality "big" was shown to be assessed using the metaphysical evaluations of "not big" (the non-expression of the quality), "big" (a physical expression of it), and "supernaturally big" (beyond naturally big). This last classification is both the ideal category of the metaphysical evaluation, and a classification of "beyond natural limits" of the pragmatic evaluation (see figure 6:9.a.). The perception of a transformation into a supernatural quality of size, when an item was perceived as bigger than the natural expected limits, was supported by later evidence in relation to naturally alive things. Animals of beyond normal size were shown to be thought of as transformations in such a way that they still expressed the original nature while having entered into a spiritual dimension of that nature. For example, a transformed kangaroo or turtle could be perceived as a "spirit being" kangaroo or turtle, expressing something of the spiritual in the new transformation.

The Yolnu have been shown to apply the metaphysical classifications to colour and particularly colour in relation to pigments. Thus they are able to perceive a pre-existence of red colour in a grey clay which was a supernatural transformation of an ancestral substance. They were then able to produce a physical transformation in that substance.
as they heated it, such that they obtained a physical manifestation of it in "red colour". This in its solid form as pigment was then able to be perceived as the transformation into solid colour as a supernatural or spiritual substance.

In each of these cases where the metaphysical classification is applied, there is a constant relation between the classifications of a pre-expression (in contrast to non-existence), a general expression, and then a perfect expression which has a supernatural or spiritual form. This metaphysical evaluation is then in an analogous relation to the classifications of the physical entity. The relations between the pragmatic and metaphysical classifications as revealed in different domains are illustrated in figure 6:9.a-d.

<table>
<thead>
<tr>
<th>pre-expression of big</th>
<th>physically big</th>
<th>supernaturally big</th>
</tr>
</thead>
<tbody>
<tr>
<td>not physically big</td>
<td>moderately big</td>
<td>big</td>
</tr>
<tr>
<td></td>
<td>very big</td>
<td>not natural</td>
</tr>
</tbody>
</table>

a. size

<table>
<thead>
<tr>
<th>existence before birth</th>
<th>physically turtle</th>
<th>supernatural turtle</th>
</tr>
</thead>
<tbody>
<tr>
<td>not turtle but turtle egg</td>
<td>hatchling</td>
<td>immature turtle</td>
</tr>
<tr>
<td></td>
<td>fully adult</td>
<td>beyond natural size</td>
</tr>
</tbody>
</table>

b. animal

<table>
<thead>
<tr>
<th>pre-expression of colour</th>
<th>physically colour</th>
<th>supernatural colour (pigment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>not colour (different colour)</td>
<td>moderately colour</td>
<td>colour intense colour</td>
</tr>
<tr>
<td></td>
<td>solid colour (more than just visually colour)</td>
<td></td>
</tr>
</tbody>
</table>

c. colour

<table>
<thead>
<tr>
<th>not expressing life</th>
<th>with physical life</th>
<th>supernaturally alive</th>
</tr>
</thead>
<tbody>
<tr>
<td>not alive</td>
<td>movement and power</td>
<td>beyond physical life</td>
</tr>
<tr>
<td></td>
<td>breathing and keeping laws</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6:9. Relations between metaphysical and physical evaluations.
When the four structures illustrated in figure 6:9 are compared, the common features are able to be isolated as in figure 6:10. The upper classifications in both figures representing the metaphysical evaluations and the lower ones the pragmatic or physical evaluations.

<table>
<thead>
<tr>
<th>pre-existence of quality (existing but not expressed)</th>
<th>physical expression of quality</th>
<th>supernatural expression of quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>not expressing that quality</td>
<td>moderately quality expression</td>
<td>intense expression of quality beyond physical Quality</td>
</tr>
</tbody>
</table>

Figure 6:10. Schematic representation of the relationship between the three-part classifications operating on pragmatic and metaphysical levels.

In the comparison of the two levels, it can be seen that there is an analogous relation between the evaluations made. The pre-existence category of the metaphysical evaluation can be seen as a minimal classification of the quality, an identification of the fact that the quality is there but not fully revealed. This is comparable to the the moderate expression of the physical classification, in that it too represents an incomplete or "partially expressed" manifestation of the quality. The central category at each level is analogous to the the other in that each is a classification of a generalised expression of the quality being assessed. The third category of the physical level is that of the ideal, perfect, or most intense expression of the quality in its physical form. At the metaphysical level, the third category is of the spiritual state or expression fully entered. Each then represents
an expression of the ultimate or ideal of the state of existence of a quality at the particular level of evaluation.

4: The Structure of Paired Relations.

Because the structure of paired relations is linked to the three-part structure it is found with the same wide distribution as it. My reasons for not identifying paired relations as complementary terms, as antonyms or even as oppositions will become apparent as their structure is discussed. The paired relation is the relation that the Yolnu perceive as existing between any pair of terms used in evaluation. Each of the terms in a pair is potentially subject to evaluation using the three-part structure. Included in the category are such pairs of terms as, long and short, or big and little, but also any two adjacent colours such as red and yellow, red and black, or red and white. The "moderate" and "intense" categories of any three-part classification also appear to function as paired relations. The difference between Yolnu pragmatic and metaphysical perceptions of the paired relations are found, not at the level of classification, but at the level of interpretation of classifications made.

When the relations within this structure are examined from a pragmatic approach, they can be equated reasonably well with the relations between complements as discussed by Lyons (1977:272). That is, in the paired relations established by the Yolnu, there are no gradeable items, each member of a pair being contradictory to the other, and not contrary to it, to use Lyon's terms. In no situation did I find a pair of terms which could be discerned as varying from that pattern. Even such pairs as big and small, hot and cold, heavy and light followed the contradictory and non-gradeable pattern of relations.
In figure 6:11, the structure of the paired relation is illustrated. At the general level there is an opposition between small and not small, and again between red and not red. The position of the contradiction of the term is then filled by the second term in the paired relationship. In some situations the contradictory term is an automatic choice, but in situations where a choice exists, the position could be filled by any of the alternatives, without denying a paired relation between them. For example, "not red" could be identified with any of the other colour terms.

Figure 6:11. Structures associated with terms in paired relations. (Paired relations indicated by arrows)

The relation between the terms used for the two extremes of quality at the specific level is seen to be analogous to the relation between the paired classifications on the general level. That is, either of the classifications within the pair at the specific level equates with the position filled by the negative of the other, and hence each can be seen as the contradiction of the other. This set of relations is then as shown in figure 6:12.
It is at this point that the Yolnu metaphysical interpretation of the evaluations starts to become apparent. The observation is made that within the category "red", there are two terms which appear to be opposed, but which are in fact referring to items which are both red. That is, in spite of the outward appearance of contradiction between the terms "very red" and "moderately red", the inner reality is that they are both expressions of the same quality or identity. This same observation is then transferred to the analogous relation between the structures at the more general level. The result is that any pair of items can be considered as being a pair of different expressions of a single identity. They are contradictory expressions at one level but are, at a different level of classification or identification, found to be the same. For a very few pairs this higher level is overtly identified. For example, "shortness" and "longness" are in a paired relation, but are identical in that they are both expressions of the quality "linearity". Similarly, "red" and "yellow" or "red" and "black" are paired relations seen as a pair of expressions of a single identity "colour/design".

This same logic can be seen in a number of other situations.

Figure 6:13, illustrates with four basic colours the range of paired
relations in the domain of colour. In this figure there is illustrated the idea that a paired relation can be seen to exist between any two colours on a general level of classification. A further paired relation exists within each colour at the more specific level, with the intense category (inner circle) being contradictory to the moderate category (outer circle). At each level, the paired relation is seen to be a pairing of expressions of a quality which at a higher level of classification expresses a unity or singularity of identity.

![Diagram showing paired relations in the domain of colour.](image-url)

Figure 6:13. Paired relations in the domain of colour.

When interpretations are made at a metaphysical level, there is a switch from perception of identity as physical, to seeing identity as being spiritual. The three part structure with its focus on the third classification as the ideal then implies that that which appears physical is only an expression of an identity which is in reality spiritual, as the physical is only the second of the three categories of which the third or ideal is spiritual.
When we examine the metaphysical level of the three-part classification, we again find a paired relation between the categories at the poles of the evaluation. In figure 6:14, the "pre-existent" category is in a contradictory relation to the "supernatural" category yet they are united in the perception of the totality of the existence of that which is being classified. That is, the pre-existent state can be perceived as equal in identity to the supernatural state in that they are both spiritual.

<table>
<thead>
<tr>
<th>pre-existent expression</th>
<th>physical expression</th>
<th>supernatural expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>not physical</td>
<td>moderately physical</td>
<td>very much physical</td>
</tr>
<tr>
<td>physical</td>
<td>physical</td>
<td>physical</td>
</tr>
</tbody>
</table>

Figure 6:14. Schematic representation of paired relations in physical and metaphysical levels of three-part classifications.

Using the same logic it is also possible to see a common identity (as I demonstrated in discussing colour evaluations) in red and yellow transformations of pigment and in red and yellow colour. These are in paired relations in different ways, but following Yolnu qualitative logic they are able to be perceived as identical in an inner spiritual reality even if different in expression. In each of these paired relations, either of the pair can be considered as the non-expression of the other. The one considered to be expressing the inner nature appears to be able to be established arbitrarily, but once established is justified by some perception of the expression of a supernatural or spiritual identity. Thus as I have shown, the non-expression of the spiritual nature of a red pigment may be in the form of a greyish clay, or a supernatural deposit of yellow ochre may be transformed
at the colour level to a non-expression of its inner nature by heating it until it turns red. This, which has no contradiction for the Yolnu, is a logical structure, being based as it is on a qualitative rather than a quantitative mode of thought.

Conclusion.

There appear then to be four fundamental "structures in the mind" used by the Yolnu in framing the structures of their evaluations and classifications. Taxonomic structures are used in the perception and classification of similarity in diverse elements. In this they provide a framework for the perception of unity and harmony in the diversity of the world around them. Anatomical structures complement the taxonomic ones. They are used in classifying perceptions of the variety of elements which make up each unified whole. The question remains as to whether these two structures are in fact one, or whether, at the level of cognition they are distinct. It is my argument that they appear to be distinct, this position being supported by the notions on which they are founded and the meaning loads which their elements carry.

The three-part structure evaluates diachronic change and synchronic variation in such a way that it can be seen as matching qualitatively the assumed three dimensional expression of existence. By evaluating the successive stages of an entity as different expressions of a single quality across time it also provides support for Yolnu perceptions of changelessness. The simple fact that the three-part structure is everywhere observable in the physical world forms an intellectual justification for the metaphysical assumptions.
The relations between the three classifications at all times supports the perception of spiritual reality as ultimate. That is, in the classifications applied to the categories of life and existence, this support is clearly displayed. The pragmatic classification of the world enables the perception of three different categories of the quality "life". Superimposed over this the metaphysical classification enables the perception of the ultimate reality to be displayed as self evident, supported at all points by the evidence of the classifications of the physical world with its identical structure.

The paired relation seen as a pair of inverse expressions of a single reality enables an apparent conflict to be classified out. While the elements of these paired terms appear superficially to be antonymic, it appears that they function in quite a different way, because Yolnu use them as qualitative evaluations whereas antonyms as normally described appear to be perceived as quantitative oppositions.

It appears that the four cognitive structures are all able to be applied to the same entities as the Yolnu see the relevance of doing so. The first two of them are used primarily in the classifying and ordering of identity, while the last two, each appearing to automatically imply the involvement of the other, are used primarily in the qualitative evaluation of identities.
NOTES

1: I did not discover any Yolnu classification where more than a single common feature was essential for its establishment. Thus in Needham's (1975) terms, each class was monothetic.

2: The coinciding of the absence of grading with the absence of quantitative evaluation matches very well with a comment made by Sapir (1949:122) that "judgements of quantity in terms of units of measure or in terms of number always presuppose, explicitly or implicitly, preliminary judgements of grading".

3: I have not discovered any paired relation where both terms were considered simultaneously as transformations of the supernatural. Red and yellow could appear to be such a pair, but the two are considered separately as they are transformations of different ancestral substances. Following Yolnu logic, the second term of any pair apparently automatically has the potential for classifying the form taken by the pre-existent or non-expressed supernatural quality.

4: It was this type of "contradiction" which Levy-Bruhl in his earlier writing considered as indicative of the mode of thought which he called "prelogical" and which later in his "Notebooks", he refers to as "incompatabilities" in which the "primitive" mode of thought attaches more importance to the affective meaning of symbols and concepts. The perceived relationships within the paired relations he (1927:250 - 254) describes as unity-duality.
BIBLIOGRAPHY


