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THE STRUCTURE OF SOLIDARITY AND ALLIANCE ON NAMOLUK ATOLL

by

KEITH MACDONALD MARSHALL

A dissertation submitted in partial fulfillment

of the requirements for the degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF WASHINGTON

1972

Approved by Vern Carroll
(Chairman of Supervisory Committee)

Department Anthropology
(Departmental Faculty Sponsoring Candidate)

Date May 22, 1972

UNIVERSITY OF WASHINGTON

Date: May 4, 1972

We have carefully read the dissertation entitled
The Structure of Solidarity and Alliance on Namoluk Atoll
submitted by
Keith MacDonald Marshall in partial fulfillment of
the requirements of the degree of Ph.D.
and recommend its acceptance. In support of this recommendation we present the following joint statement of evaluation to be filed with the dissertation.

This is an important study which operationalizes the notion of "social solidarity" by applying measures from directed graph theory to key transactions (land transfers, marriages, and adoptions) between Namoluk descent groups (lineages, clans, and subclans). It is at once a contribution to theoretical social science, to anthropological methodology, and to Micronesian ethnography.

Apart from the rich detail of data and discussion, there are two main empirical generalizations which have been discovered to apply to this society, and which deserve testing on a larger sample: (1) the greater the inclusiveness of the descent unit, the greater the degree of its connectivity with like units; (2) the connectivity of the alliance system is weakened as weaker bonds between lineages are eliminated. The connectivity of the societal alliance system is assigned a well-defined ordinal measure, allowing comparison with alliance systems in other societies.

Also of note in this dissertation is the analysis of the role of cross-cousin marriage (uncommon in Crow-type kin-classification systems) — along with leviritic and sororal marriage — in maintaining the alliance (or, exchange) system. This leads to a particularly useful discussion of (intra-group) "sharing" as a structural principle which is complementary to (inter-group) "exchange."

DISSERTATION READING COMMITTEE:

Doctoral Dissertation

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Signature Keith Marshall

Date 5-25-72

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ACKNOWLEDGEMENTS

Acknowledgement of help from everyone who has aided this research would be very difficult since so many people have contributed to its completion in one way or another. Therefore, I shall mention only those whose assistance has proved especially significant.

My intellectual debt to three men is apparent in the pages that follow. Vern Carroll ushered a somewhat skeptical novice into the ranks of "students of kinship," converted me, and ended up with a zealous evangelist on his hands. Throughout my graduate studies he has been everything an advisor should be: professional example, encouraging friend, helpful critic, and source of all manner of support. John Atkins first exposed me to qualitative mathematics and specifically to graph theory. He has tolerated patiently my sometimes bumbling efforts to master these tools, and if I have misused these approaches in the pages to follow, this in no way reflects the quality of his teaching. Finally, Jim Nason has been a ready friend and fellow graduate student to whom I owe most of my knowledge of Micronesian history.

The four months of research on Moen, Truk, were made much easier as a result of the comfortable quarters and constant hospitality so generously provided by the faculty of Mizpah High School. Special thanks must go to Jack and Mary Carter, Pete Calhoun, Tom and Monika Chilton, Rev. Steve and Totte Evans, Bob and Margaret Fincke, Harry and Phyllis Hochstetler, Edison Kojjo and Dick Reynolds. Likewise, our good friends in the Catholic Mission, Truk, provided stimulating conversation and otherwise aided the study on numerous occasions. Thanks particularly to Fran Hezel, S.J., Ken Hezel, S.J., Paul Horgan, S.J., and William Rively, S.J.. The door was always open and help of any sort was always offered by our close friends Dr. Charles and

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Bruce and Joan Kidman--Peace Corps Volunteers on Namoluk from 1968-1970--warmly opened their Namoluk home to us until we could arrange housing. Their contribution of data and the sincere appreciation for their help are both more than they realize.

My wife, Leslie, has been a full partner in fieldwork. Her cheerfulness, insightful observations, thoroughness, intellectual contribution and love indelibly influenced the course of the study.

The research was made possible by a Predoctoral Research Grant (MH11871-01) and related Fellowship (MH42666-01) from the National Institute of Mental Health, and by a grant of Institutional Funds from the Department of Anthropology, University of Washington. For all of this financial support I am sincerely grateful.

Above all, my greatest debt is to the wonderful people of Namoluk who cooperated in every possible way. This research is truly theirs and I only hope my analysis does justice to their culture and their island. Several Namoluk people were especially bountiful sources of data and help, among them Santer R. Agrippa, Sapuro I. Kouch, Kichi Lippwe, Chiteuo A. Puas, Lipwei S. Reuney, Misael C. Setile, Kameol, Oleper and Samperes. Even more than these, my constant companion, teacher, landlord and friend, Sarel R. Agrippa, skillfully and patiently tutored me in Namoluk language and culture. To all of you, the people of Namoluk: Fakkun kilisou chapur ngani ami ren ami alilis! Elet ami chon Namoluk monson, ami aramas mi fakkun umoumoch. Ngang ia fangala masawan ei puk ngani ami--wewen pwe epwe ekis pwarata ukukun ai kilisou me ai tong. Ina chok.

"The object of social structure studies is to understand social relations with the aid of models (Levi-Strauss 1963:281)."

"I don't want to turn anthropology into a branch of mathematics but I believe we can learn a lot by starting to think about society in a mathematical way (Leach 1961a:7)."

"At first sight, it would appear that mathematics is concerned with abstract relations and social theory with empirical social relations. However, the concepts of social theory are abstractions also, and there is no intrinsic reason why mathematics cannot be used to express theoretical, or even empirical, statements (Doreian 1970:6)."

CHAPTER I. THE PROBLEM

A. Purpose of the Study

This study is an attempt to devise an ordinal measure of "social solidarity" or "social cohesiveness." I do not ask whether social solidarity does or does not characterize a particular inter-group relationship; rather, I ask whether one such relationship is stronger or weaker than another. By employing a branch of qualitative (nonquantitative) mathematics, known as the theory of directed graphs (digraphs), I seek to demonstrate and to account for variation in the amount of "social solidarity" within and among kinship units on Namoluk Atoll.

In order to carry out such an investigation, it is necessary to set aside questions like, "What <u>is</u> social solidarity?", and, "What does social solidarity <u>really</u> mean?" Although these are important questions, to which many social scientists have addressed themselves (e.g., Durkheim 1922), answers to them remain problematic. Answers to questions of this nature generally fall into one of two categories. In the first instance, the phenomenon may simply be defined by fiat. In the second case, an effort may be made to survey every definition that has ever been offered in the literature, in hopes of resolving all contradictions among them and arriving at a consensus definition. Neither stipulative definition nor definition by consensus is felt to be particularly helpful for the task at hand.

We wish to account for differences in the amount of solidarity exhibited within and among descent groups in a single society. To this end, it is imperative that we set forth an explicit, operational definition of solidarity. While such a working definition cannot escape a certain arbitrariness, it is not put forward as <u>The</u> definition of social solidarity. On the contrary, it is offered as a tool to help us get on with a task of much greater interest than definitional quibblings. Out of an analysis of a

single society based on an explicit, operational definition of social solidarity, it may prove possible to conduct meaningful comparative studies of social solidarity among several related societies.

I accept that the quality "social solidarity" consists of certain kinds of relationships among individuals or groups. Once I specify what these relationships are and among which social units they occur, graph theory provides a way for measuring the strength or degree of solidarity relationships for any given case. Presumably, such measurement will point up differences in intensity which must be explained or accounted for in terms of anthropological theory.

The theory of directed graphs is a refined branch of topology that is an especially useful methodological tool for an anthropologist interested in problems of social structure. In keeping with this mathematical system and the need for operationalizing "social solidarity," I shall equate social solidarity with structural connectivity in a digraph. When viewed in this way, as a structural property, the amount or degree of solidarity in a group or in a society varies directly with the strength or number of transactions among social units that are believed to promote "cohesiveness." The more mutually reinforcing transactional bonds that are created through an exchange of scarce and valued resources between two social units, the greater will be their social solidarity. Translated into digraph terms, the greater the strength of connectivity in a digraph representing transactions among units, the greater will be the degree of social solidarity among those units. Thus, for our purposes, it is the fundamental human social relationships of sharing and exchange that comprise the essence of social solidarity.

At this point, it will prove helpful to take a closer look at the relationship between social anthropology and qualitative mathematics.

B. Qualitative Mathematics and Social Anthropology

In his famous essay, "Rethinking Anthropology" (1961a), Leach argued persuasively for the importance of topology in the study of many anthropological problems. Pointing out that the fundamental variable in this branch of mathematics is the degree of connectedness among units, Leach went on to stress that mathematical approaches make no prior assumptions about what kinds of structural patterns may emerge in societies organized on different principles. Leach concluded that a formal symbolic language or abstract way for representing anthropological facts would have the great virtue of eliminating "excessive entanglement in empirical facts and value loaded concepts."

Leach was not the first anthropologist to point out the relevance of qualitative mathematics for anthropology. As early as 1954, Levi-Strauss mentioned the potential usefulness of a number of kinds of qualitative mathematics, such as set theory, group theory, and topology for the study of relations and structure (Levi-Strauss 1954, 1963).[1] In 1957, Nadel introduced symbolic logic into his book on social structure as an efficient, accurate and concise way for dealing with formal features and relations. Symbolic logic and topology are very closely related, and all propositions in one can be expressed as propositions in the other. In spite of these early "calls to arms," by Leach, Nadel and Levi-Strauss, none of them actually applied qualitative mathematics to a specific body of anthropological data in any detail.

While these developments were taking place in anthropology, small-group sociologists and social psychologists had begun to explore, in direct collaboration with mathematicians, the possibilities of one branch of topology--the theory of graphs--for investigating sociometric and interaction

process problems in controlled laboratory group experiments (Festinger 1954; Harary and Norman 1953; Kemeny 1959).[2] Out of these initial collaborative efforts, work has continued apace, and a number of landmark volumes in the application of graph theory to social science problems has been a result.[3]

Flament's book, Applications of Graph Theory to Group Structure, became available in an English translation in 1963. Not only does Flament provide a clear introduction to elementary graph theory, but he also presents an application of structural balance theory to respect and familiarity relationships within what Levi-Strauss has called l'atome de parenté (Atkins 1966). This brief application has been followed up and expanded on by Freilich (1964) and Sweetser (1967). Freilich attempted to use the theory of balance in signed digraphs to explain the distribution of authority and closeness in kinship structures. However, Sweetser shows that in so doing he violated a major requirement of balance theory, which is that qualities labelled plus and minus must be true opposites. Sweetser's (1967) paper is an effort to explore path consistency as a possible better way for handling the distribution of authority in hierarchical structures, where such authority is legitimate and treated with respect and formality.

The definitive work available today for mastering the theory of directed graphs and for applying digraphs to questions of anthropological import is Harary, Norman and Cartwrights' (1965), Structural Models: An Introduction to the Theory of Directed Graphs. Sweetser (1967) builds specifically on Harary, Norman and Cartwrights' elaboration of structural balance theory (1965, chapter 13), and Barnes (1969) attempts to clarify the various usages of connectedness and connectivity in the literature, by bringing them into accord with the terminology set out in Structural Models

(chapter 3). Having surveyed the deductive mathematical models applicable to structural problems in the behavioral sciences, Livingstone (1969) maintains that graph theory offers the most promise for future development. Drawing on Harary, Norman and Cartwrights' discussion of tournaments (1965, chapter 11), Livingstone provides a brief but suggestive analysis of certain features of the marriage system among the Purum (1969:239-46).

Other than the articles mentioned above by Freilich (1964), Livingstone (1969), and Sweetser (1967), I am aware of only two other papers in anthropology that have made use of the theory of directed graphs. As part of their sophisticated investigation into how game theorists represent formally the rules of games, Atkins and Curtis (1969) point out the close relationship between game theory and graph theory. They go on to provide a useful demonstration of how digraphs can clarify certain aspects of the structure of cultural rules. Finally, in pointing out promising future analytical tools, in the conclusions to his paper on the problems and kinds of validation in social anthropology, McEwan (1963) observes that graph theory offers good possibilities for handling "go-betweens." McEwan takes this idea from a suggestion made by Harary and Norman (1953), who demonstrate how graph theory may be used to study "mediating roles" or "liaison persons" in social relations.

While few anthropologists have made use of directed graphs, not many more have given attention to undirected graphs. What attention undirected graphs have received has been in efforts to give some rigor to the idea of "network" as first proposed by Barnes (1954). A network was viewed by Barnes, in a somewhat loose fashion, as an ever-ramifying set of ego-centered social relations that did not occur within a group context. In this vague sense, the concept of "social network" has been seized upon by anthropologists

working in urban areas and in complex societies as a way to conceptualize their data. This is shown by the attention paid to "social networks" in several recent symposia and articles (Aronson 1970; Jay 1964; Mayer 1966; Mitchell 1966, 1969 and Hallpike 1970), however, no anthropologist to my knowledge, has attempted to merge the metaphorical "social network" idea with the rigorous data language for treating networks available in graph theory. Until such a merger is brought about, the network idea can have only limited heuristic value for anthropology. But once this merger takes place, a rich array of ideas, insights, and "pretested" theorems pertaining to structural problems becomes immediately available (e.g., Harary, Norman and Cartwright 1965). The significance of such a set of logically derived, abstract, analytical tools for representing and comparing aspects of structure within a culture or cross-culturally should be readily apparent. The theory of directed graphs provides a content-free mathematical system suitable for the representation of structure that permits us to move beyond the realm of metaphor and analogy to more precisely represent the orderliness of our data.

C. Application to Namoluk Ethnography

The new ground to be broken by this dissertation is that the theory of directed graphs will be applied to a body of land tenure and kinship data from Namoluk Atoll, with the goal of demonstrating and explaining differences in social solidarity among descent groups on the island. This is an attempt to apply graph theory to an anthropological problem in a detailed and rigorous fashion. Interest here is in the ordered system that may be discovered or created among a set of social units that are connected through a series of social transactions. Digraphs provide the model and the mathematical theory to be used in representing and analyzing this system, and as will become apparent, they are ideally suited to this task.

A number of assumptions are made in carrying out this analysis. First, it is assumed with Levi-Strauss, Leach, Nadel and others, that anthropological problems in the study of kinship and social structure are amenable to and can profit from the application of qualitative mathematics. A second assumption is that exchange among persons and groups and sharing within groups is basic to human social behavior. Exchange transactions lead to alliances that may or may not be friendly; exchange transactions are also self-perpetuating, in that they usually lead to further exchanges. Agreeing with both Durkheim (1922) and Levi-Strauss (1949), a final assumption made in the analysis to be presented is that different kinds of exchange reinforce and reiterate the links that bind social units together. Exchange transactions, and the interconnections that arise from and comprise them, form the essence of social solidarity.

The problem of boundaries arises at this juncture. How are Namoluk "social units" to be delimited, and where will the lines be drawn to demarcate Namoluk "society?" Any boundary is arbitrary at some level, but certain boundaries are inherently more appropriate than others. Accepting this, I have decided to mark the boundary for Namoluk society at the edge of the reef: the analysis will concern only Namoluk residents and their interrelationships. Off-island transactions by Namoluk people will be disregarded in the analysis. Where some people have chosen to participate in a wider social system, as regards the transactions under investigation, they will not be considered. Over one half of these extra-island transactions conform in every respect to the rules governing the intra-island system and can be handled quite nicely by the model to be presented. In the interests of simplicity, however, these transactions have been deleted, along with the remaining extra-island transactions that do not comply with the rules of the

system, by deciding to eliminate from consideration all extra-island transactions.[4] Extra-island transactions constitute only about 10 percent of the total transactions in any case, and thus the model I have constructed accounts for more than 90 percent of the empirical data under examination.

The boundaries of the constituent units of Namoluk society are those formed by kinship and descent. These constituent units are the following: the lineage, the subclan, and the clan. These descent groups are the basic organizational units of Namoluk society, and are discussed in detail in chapter 3 below.

For the Namoluk people, as well as the anthropologist, the two most critical and cherished resources for an atoll community are people and land. Perhaps it is for such reasons that anthropologists have expended so much effort studying man-land interaction in island societies (e.g., Goodenough 1951; Lieber 1968). At its most basic level, social solidarity on Namoluk consists of land, people and their interconnection. Three fundamental types of transactions that concern the circulation of these two resources within Namoluk society have been isolated: conveyance of land between persons; marriage; and adoption.

Transactions in land, marriage and adoption have been selected for attention because, from the emic point of view expressed by Namoluk people, these transactions are basic to most other social relationships and are the foci of a tremendous amount of effort and concern. When Namoluk informants are asked to explain exchange transactions involving such things as food, labor, or political support, they nearly always mention a prior transaction in kinship or land. Since transactions in "blood and mud" (Silverman 1971:72) are fundamental to many other kinds of social relations in the eyes of Namoluk people, it follows that an analysis of transactions in land and people

should permit us to comprehend a variety of other social transactions on the island. Such a course of action commends itself further when the constraints on time and resources available for fieldwork are taken into account. Directing our efforts toward "core" relationships should help us to maximize our understanding of the culture under study within such limitations.

Namoluk social structure and social solidarity rest on an exchange of land and people among lineages, subclans and clans, according to accepted rules of land transmission, marriage and adoption. These core exchange transactions are supplemented by other kinds of exchange (e.g., material goods, food, labor, money and political support), but these other kinds of exchange will not be dealt with here for reasons of the limitations on time and resources mentioned above. How the three types of transactions in land and people bear on the interdigitation of kinship units--lineages, subclans and clans--forms the body of the analysis.

D. Goals and Chapter Outlines

The goals of this study are several. First, the study is a methodological exercise designed to demonstrate the relevance of graph theory for social anthropology. Digraphs are used to focus on the structural pattern of exchange transactions among a set of social groups (ordered by descent) and a set of variables (land transmission, marriage and adoption). Second, the study is a theoretical exercise in the tradition of exchange and alliance theory: analysis of a set of exchange transactions suggests the fruitfulness of the alliance viewpoint in anthropological studies. Finally, the study is an effort to reach some theoretical conclusions of general interest to students of kinship and social organization.

Chapter 2 provides background information about Namoluk Atoll, discussing its location, geographical features, flora, fauna and climate. Following this,

an introduction to the demographic setting on the island is provided, after which an historical survey of Namoluk from the early nineteenth century to the present is undertaken.

Chapter 3 offers a synopsis of the Namoluk kinship system, touching on terminology, aspects of kinship behavior, and the organizing units of Namoluk society: lineage, subclan and clan. The chapter concludes with a section stressing the importance of kinship as sharing.

In chapter 4, the Namoluk system of marriage is examined in some detail, with emphasis on the preferential marriage system as a mechanism of alliance. After a presentation of numerical data on preferential marriages and a look at patterns of off-island marriage, the content of the marital relationship itself comes under scrutiny.

Chapter 5 provides an outline of the land tenure system on the atoll, noting especially those points at which it differs from land tenure systems described for elsewhere in Greater Trukese society.[5] Namoluk categories of land resource classification and methods of transfer are discussed, and data summarizing such transfers over the past century are presented.

In chapter 6 attention shifts from ethnography to methodology and analysis. A series of definitions based on digraph theory are listed, and the notions of connectivity and density in a digraph are discussed. Following this is a demonstration of how the ethonographic data are translated into digraphs, and then the digraphs themselves are presented. After each digraph has been analyzed into its structural components, a detailed comparison and contrast of the digraphs is carried out.

Chapter 7 shifts the focus once again from intensive methodological analysis to a broader theoretical perspective. An effort is made to interpret and account for the nonrandomness of the Namoluk system of solidarity and

alliance shown in chapter 6 in terms of general issues in anthropological theory.

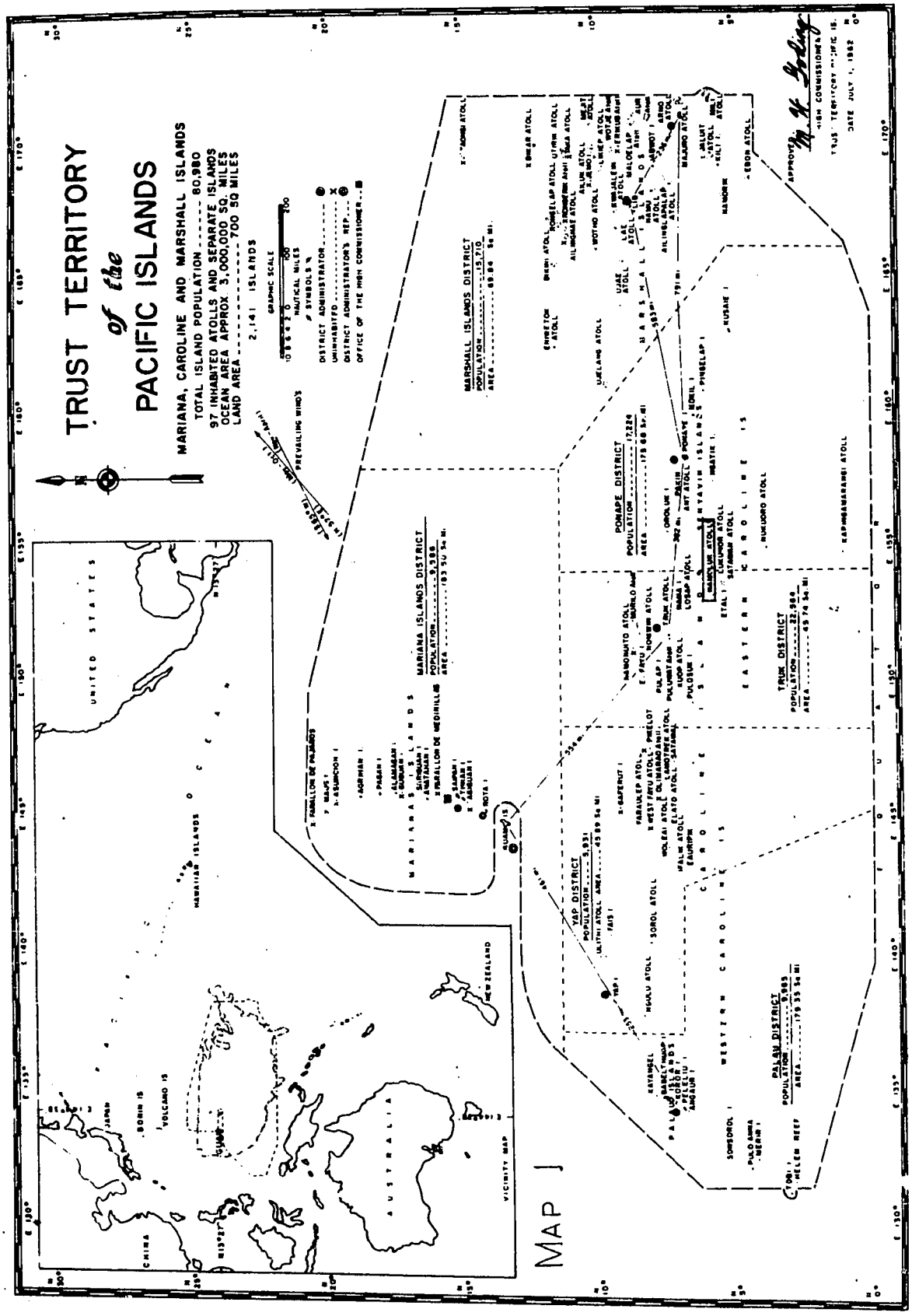
II. BACKGROUND

A. The Physical and Ecological Setting: Geography

Located at 5° 55' North latitude, 153° 08' East longitude in the Eastern Caroline Islands of Micronesia, Namoluk is part of Truk District, one of six administrative districts that make up the United States Trust Territory of the Pacific Islands (see map 1). The Trust Territory of the Pacific Islands, along with the Trust Territory of Papua-New Guinea, is one of two remaining United Nations trusteeships created after World War II. It consists of the former Japanese League of Nations mandate in the Marianas, Caroline, and Marshall Islands.

Namoluk is a small, triangular-shaped coral atoll standing alone in the sea. No matter which direction one looks from Namoluk, his eye will meet only the wide, heaving expanse of the Pacific stretching to the horizon. Despite this apparent isolation, Namoluk does have neighbors. Closest in distance, in language and in culture is Etal Atoll--one of three atolls that comprise the Lower Mortlock Islands thirty-five miles to the southeast.[1] Satawan and Lukunor Atolls combine with Etal into a series of seven inhabited communities, nearly all within sight of each other. Sixty-five miles from Namoluk to the northwest lies Losap Atoll, and fifteen miles beyond stands the makatea island of Nama. Another forty-five miles northwest of Nama loom the verdant mountain peaks of the complex atoll of Truk. Moen Island, Truk is the port-town that links Truk District to the rest of Micronesia and to the world.

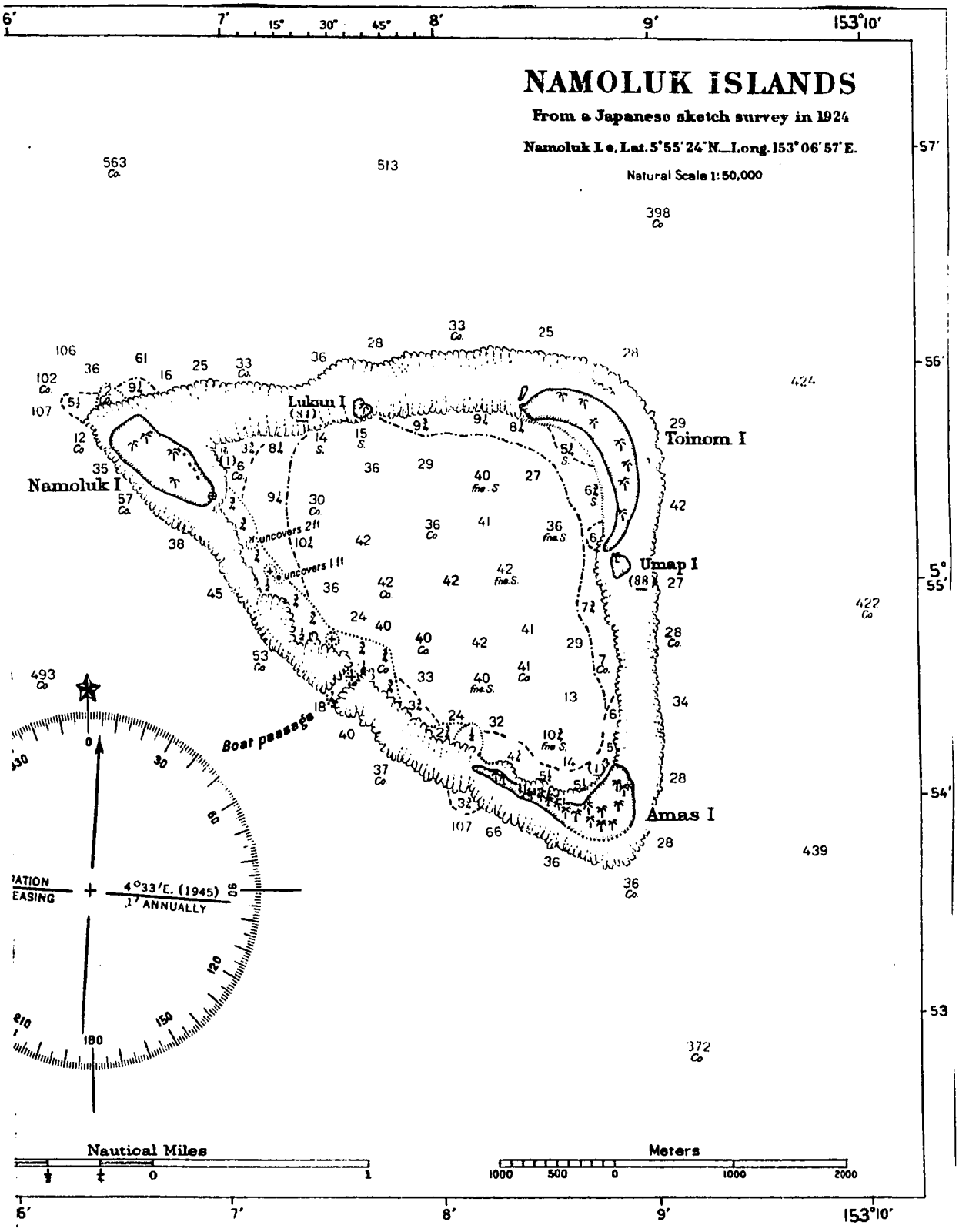
Namoluk and the other outer islands of Truk District are known collectively as Fanaapi 'sandy islands'. Namoluk itself is grouped with Nama and Losap into a category called Lukeisel, literally 'middle of the rope', a reference to the line formed by these three islands that "ties together"


TRUST TERRITORY
of the
PACIFIC ISLANDS
MARIANA, CAROLINE AND MARSHALL ISLANDS
TOTAL ISLAND POPULATION ------ 80,980
97 INHABITED ATOLLS AND SEPARATE ISLANDS
OCEAN AREA APPROX 3,000,000 SQ. MILES
LAND AREA ------ 700 SQ MILES
2,141 ISLANDS
GRAPHIC SCALE
NAUTICAL MILES
SYMBOLS
DISTRICT ADMINISTRATOR
UNINHABITED
DISTRICT ADMINISTRATOR'S REP.
OFFICE OF THE HIGH COMMISSIONER
PREVAILING WINDS
MARIANA ISLANDS DISTRICT
POPULATION ------ 9,388
AREA ------ 183 SQ Sq Mi
MARSHALL ISLANDS DISTRICT
POPULATION ------ 15,710
AREA ------ 69.86 Sq Mi
PONAPE DISTRICT
POPULATION ------ 17,326
AREA ------ 178 60 Sq Mi
TRUK DISTRICT
POPULATION ------ 22,964
AREA ------ 49 74 Sq Mi
YAP DISTRICT
POPULATION ------ 5,931
AREA ------ 45 89 Sq Mi
PALAU DISTRICT
POPULATION ------ 9,985
AREA ------ 179 55 Sq Mi
MARIANA ISLANDS
CAROLINE ISLANDS
MARSHALL ISLANDS
EASTERN CAROLINE IS
WESTERN CAROLINE IS
UNITED STATES
AUSTRALIA
NEW ZEALAND
CHINA
JAPAN
PHILIPPINES
VICINITY MAP
TRUST TERRITORY PACIFIC IS.
HIGH COMMISSIONER
DATE JULY 1, 1962
APPROVED
MAP 1
Navy-PPO, Guam

Morschlok Souou 'the Lower Mortlocks' and Chuk 'Truk' (literally, 'mountains').[2] Lukeisel sometimes is referred to as Morschlok Soulong 'the Upper Mortlocks' to contrast it with the Lowers.

The name Namoluk (pronounced Namwoluk) comes from the words nom 'lagoon' and luk 'middle', and may have been bestowed by traditional navigators to refer to the atoll's position "in the middle" between the Lower Mortlocks and the Nama-Losap cluster.[3] This idea gains support from Kubary (1880) who observed that Namoluk was visited or sighted as a reference point without fail on canoe voyages from the Lowers to Losap, Nama and Truk (see also Gladwin 1970). An alternate name by which Namoluk was known in the past is Nomoilam 'deep place in the sea' (from nom 'lagoon' and lam, a contraction of le metau 'the sea'), but while this name is remembered by Namoluk people it is not in use today.[4]

With the single exception of Nama Island, Namoluk is the smallest permanently inhabited island in the Eastern Carolines (both Truk and Ponape Districts) (Manchester 1951:237). The five islets that make up Namoluk Atoll have a combined total land area of .322 square miles (approximately 206 acres), and the lagoon these islets encircle measures only 2.972 square miles (1951:237). In the Eastern Carolines, only Mokil and Puluwat Atolls have smaller lagoons than Namoluk. Dropping to forty-two fathoms at its center, Namoluk's lagoon is among the deepest in the Pacific and the ocean waters surrounding the atoll plunge very quickly to depths of well over 400 fathoms only a mile offshore. Map 2 shows the arrangement of Namoluk's five islets, and their respective land areas appear below: Namoluk, .120 square miles (77 acres); Amwes (Amas), .108 square miles (69 acres); Tōinom, .083 square miles (53 acres); Lukan, .006 square miles (4 acres); and Umap, .005 square miles (3 acres). Only the three largest islets support a fresh water lens sufficient for growing taro, and only Namoluk and Amwes have ever been inhabited on a permanent basis.



MAP 2 U.S.H.O. CHART 5425

Sometime between June, 1944, when the United States Navy made an aerial photograph of Namoluk, and October, 1969, when the research reported here began, an "unnamed" sixth islet to which Bryan (1971) makes reference has merged with Tŏinom and now forms the northwest tip of that islet. This piece of land, called Chä after a plant, chekis (Pemphis acidula), that grows there in abundance, quite probably merged with Tŏinom at the time of Typhoon Phyllis which devastated Namoluk in 1958.[5]

B. The Physical and Ecological Setting: Fauna

Atoll land area usually is small and limited in environmental diversity, and as a consequence terrestrial faunal and floral assemblages are low in species density and variety. MacArthur and Wilson (1967) show conclusively that land area alone accounts for most of the variation in species numbers on islands. They also point out that land area is correlated with environmental diversity, which exerts a more direct effect on species numbers.

Namoluk Atoll supports only three species of wild mammals and two species of domesticated animals. Wild mammals present are the Polynesian roof rat (Rattus exulans), the larger grey European house rat (Rattus rattus)--both known as maniwel--and the flying fox or fruit bat (pwää). Domestic mammals include only the common house cat (katu) and the pig (pik). Dogs (kolak) were present on Namoluk in the past, but there have been no dogs on the atoll since late 1963 when they were all killed because of the trouble they caused among people and because they had become a public nuisance.[6]

The rat population of Namoluk is very large and rats constitute a problem for man since they depredate the coconut crop--the islanders' main source of cash. Well over 600 rats were trapped in connection with an epidemiological project carried out during 1970-71 (Marshall, Marshall and Wallace: 1972), and if this sample of rats was representative, R. exulans is

nearly twice as common as R. rattus on the atoll.[7] Fruit bats probably number in the hundreds and they are much despised by Namoluk people, not only because they eat the breadfruit, papaya and banana crops, but also for their habit of urinating on themselves while hanging upside-down in trees. Bats are not eaten on Namoluk and mention that they are considered a delicacy in the Marianas produced only expressions of revulsion.[8] The cat population of Namoluk numbers between forty-five and fifty, wi i the great majority of these living on Namoluk islet and a few each on Amwes id Tōinom. Cats are kept solely to prey on rats and they scavenge or raid peoples' kitchen houses for their food. Only occasionally will people feed their cats, the idea being the hungrier the cat the more rats it will catch. There were twenty-seven pigs on Namoluk in March, 1971, although the pig population of the atoll is known to have been much greater in the past.[9] Pigs are raised for food, but people become quite attached to them as pets. Baby piglets may be kept in peoples' houses and carried around in peoples' arms. Pork is a special food consumed on an average only four to six times a year.

The only other domestic creature existing on Namoluk is the chicken. Nearly every family has at least one chicken and there are approximately 350 on the atoll. Chickens are raised for food and their eggs are eaten by only a few people--a dietary habit learned from Americans. Chicken, like pork, is a food reserved for feasts and special occasions, and it does not form part of anyone's steady diet.

Wild birds are well-represented with three species of land birds, five species of shore birds, and seven species of sea birds making Namoluk their home for part or all of the year. In addition, two species of land birds, one species of shore bird, and two kinds of sea birds are occasional visitors (Marshall:n.d.a). A number of these wild birds are eaten by Namoluk people

whenever they can be captured, most notably the Micronesian starling (Aplonis opacus angus), the brown noddy (Anous stolidus pileatus), the white-capped noddy (Anous tenuirostris marcus) and the white-tailed tropic bird (Phaethon lepturus dorotheae). Wild bird eggs are not eaten.

Reptiles are represented by four species of skinks and at least four species of gecko.[10] Both the green sea turtle (Chelonia mydas) and the hawksbill turtle (Chelonia imbricata) occur in and around the Namoluk lagoon and sometimes lay their eggs behind Amwes. Both kinds of sea turtle are hunted actively for their meat--a prized food--and their shells--a valued trade item. There are no terrestrial tortoises nor do any other reptiles or any amphibians inhabit Namoluk.

Land crustacea are abundant. Hermit crabs (Coenobita sp.) are everywhere underfoot and the large coconut crab (Birgus latro) provides a delicious meal sought especially by women. In addition, a formidably clawed land crab (probably Cardisoma sp.) burrows into the ground everywhere away from human habitation and is eaten regularly by people.

Insects abound on Namoluk with Diptera and Coeleoptera the most prevalent. Hymenoptera and Lepidoptera are comparatively rare.[11] Flies and mosquitoes prove especially bothersome.

Far and away the richest faunal assemblage on Namoluk lives on and around the reef and in the lagoon and surrounding ocean waters. It is to this bountiful source that the people turn for their major input of protein. Fish of every description frequent Namoluk's waters and the island has a reputation throughout Truk District as a place where one need never go hungry for fresh fish. The most prized food fish are takou 'yellowfin tuna', angarap 'skipjack tuna', ngel 'wahoo', pöllai 'yellowtail', söbor 'mahimahi' and

ngerau 'jack', all of which are caught trolling in the open ocean. It is not uncommon for thirty or forty ten to fifteen pound fish of these varieties to be caught in a single day on Namoluk. Münger 'flying fish' are snared out of the air with nets at night as they fly toward flaming coconut frond torches carried aboard canoes moving up and down just beyond the reef. Though seasonal, 400 to 500 of these fish (each about a foot long) may be caught in an evening. Every conceivable type of fishing occurs on Namoluk, but most popular are trolling behind a sailing canoe or motorboat, spearfishing with goggles, pole and line fishing, drive net fishing, butterfly net fishing, throw net fishing, and the use of fish weirs. Along with fish and turtles, the ocean provides lobsters, octopi and edible mollusks.

C. The Physical and Ecological Setting: Flora

Approximately 120 species of plants grow on Namoluk, but only a few of these form part of the regular human diet.[12] Staple crops are mei 'breadfruit' (Artocarpus sp.), which occurs seasonally in many named varieties, and pula 'giant swamp taro' (Cyrtosperma chamissonis). Nu 'coconut' (Cocos nucifera), uuch 'banana' (Musa sapientum), and laimes 'lime' (Citrus aurantifolia) also find their way into nearly everyone's normal weekly meals. All of these plants are cultivated.

A number of other plants are highly prized as food and are eaten with gusto whenever available. Seven of these plants are cultivated and include: kurukur 'sour orange' (Citrus grandis), oat 'true taro' (Colocasia esculenta), momiap 'papaya' (Carica papaya), sasaf 'soursop' (Annona muricata), mwik 'chili pepper' (Capsicum frutescens), pwankin 'squash-pumpkin' (Cucurbita moschata), and uou 'sugarcane' (Saccharum officinarum). Uncultivated wild plants whose fruits also are common foods on Namoluk include: feniap 'mountain apple' (Eugenia sp.), nin (Morinda citrifolia), afuch (Crateva speciosa), and two

named types of pandanus--sillau and fachaire--(Pandanus cf. tectorius). Namoluk people recognize seven other edible plants that only are consumed in times of famine. Since famine is no longer a threat, these plants are no longer consumed except in a rare instance: kä 'dryland taro' (Alocasia sp.), mökumök 'arrowroot' (Tacca leontopetaloides), ep (Dioscorea alata) and pereka (Dioscorea bulbifera) 'wild yams', rökurök 'a wild relative of the sweet potato' (Ipomoea littoralis), and the seeds of two trees, sif (Terminalia catappa) and umwa (Neiosperma oppositifolia). Aside from food, plants are used in a host of ways by Namoluk's inhabitants, among them building materials, fertilizer, fuel, medicine, clothing, and fishing gear.

D. The Physical and Ecological Setting: Weather

Namoluk's climate is typically tropical: warm, humid and sunny. Steady sea breezes cool the island and in the shade of the luxuriant vegetation the heat and humidity are not oppressive. Rain is sudden and violent with thunderstorms a rarity. Annual rainfall is 140 inches or more and typical daily maximum and minimum temperatures are 91 degrees and 78 degrees Fahrenheit. Table 1 records temperature and rainfall data gathered on Namoluk daily from January 1, 1970--July 31, 1971. Although Namoluk lies outside the normal typhoon belt, it was devastated by a typhoon in 1958, and it receives periodic wind damage to crops from tropical storms that form in the Eastern Carolines and later develop into typhoons as they move north and west.

E. The Demographic Setting

The earliest population estimate available for Namoluk was cited by a missionary, L.H. Gulick (1862), who reported a population of approximately 300. Twelve years later, another missionary who called at Namoluk, E.T. Doane (1874), guessed the population to be somewhere between 300 and 500. When compared with available genealogical data and Gulick's figure from a few

TABLE 1

MONTHLY RAINFALL AND TEMPERATURE* DATA FOR NAMOLUK ATOLL, CAROLINE ISLANDS

Month	Year	HiHi	LoHi	HiLo	LoLo	AvHi	AvLo	Total Rain	Heaviest 24 hr. rain	Days no rain
Jan.	1970	93	83	82	76	88	78	10.83"	2.49"	5
Feb.	1970	96	83	82	76	88	79	7.28"	1.95"	10
Mar.	1970	97	84	82	77	90	80	2.58"	.73"	14
April	1970	102	82	82	75	91	79	9.39"	1.89"	9
May	1970	103	82	81	75	93	78	12.42"	2.40"	1
June	1970	104	86	82	75	95	78	11.12"	2.45"	4
July	1970	106	86	83	75	97	79	9.13"	2.32"	11
Aug.	1970	102	82	80	74	93	77	20.04"	4.15	5
Sept.	1970	103	84	82	74	93	78	13.50"	5.09"	5
Oct.	1970	98	82	80	74	91	78	16.44"	2.80"	5
Nov.	1970	95	81	82	76	90	78	13.07"	1.62"	6
Dec.	1970	102	84	82	73	86	78	13.92"	1.65"	2
Annual	1970	106	81	83	73	91	78	139.72"	5.09"	77
Jan.	1971	95	81	82	75	90	78	16.00"	3.00"	10
Feb.	1971	95	80	81	75	89	77	16.02"	2.95"	4
Mar.	1971	100	85	79	72	93	77	12.29"	2.90"	8
April	1971	98	81	80	76	91	78	12.39"	2.80"	2
May	1971	97	81	80	74	91	78	15.93"	4.20"	2
June	1971	108	81	80	73	96	77	13.54"	2.00"	1
July	1971	103	79	78	73	92	76	22.21"	3.35"	2
7 month totals	1971	108	79	82	72	92	78	108.38"	4.20"	29

*temperatures are given in degrees Fahrenheit.

years earlier, Doane's estimate is probably reliable at between 300 and 400. Taking a figure of 350 for the 1874 population, a population decline of about one-third can be traced from 1874 to 1920 (see table 2). If these figures are, in fact, accurate, this represents a substantial population loss in the early years of sustained foreign contact. Nevertheless, it is not as dramatic as the precipitous 45 percent decline in the population of Lamotrek Atoll (Alkire 1965:25-26) or the 70 percent drop in the population of Etal (Nason 1970:41-44). It is probable that introduced diseases in the late nineteenth and early twentieth centuries account for the decrease in Namoluk's population at that time, but no specific data are available in this regard.

From 1920 to 1930 Namoluk's population grew very slowly, largely because an epidemic of unknown sort (remembered by informants to have struck in 1927) killed an estimated fifty people in a matter of weeks. Between 1930 and 1935 the population grew rapidly until the next figure available (1945) recorded a steep drop back to a pre-1930 level. This decline reflected a terrible epidemic of tuberculosis that ravaged Amwes and led to its depopulation in the late 1930s. Since shortly after World War II, Namoluk's population has risen steadily and it is continuing to grow very fast. In 1971, the total living population (TLP) was 386 (see table 3). Of the TLP, however, only 281 people actually were resident on the atoll, yielding a population density of 843 persons per square mile.[13] In the last twenty-five years, Namoluk's population has increased by nearly two-thirds over what it was in 1945. Even more telling is that most of this increase has taken place in the past decade. In large measure this sudden spurt of growth may be attributed to the introduction of better medical care which has sharply reduced the death rate--particularly infant and pre-natal mortality.

Despite a rapidly growing population, a traditional emphasis on producing

TABLE 2

COMPILATION OF NAMOLUK POPULATION STATISTICS

YEAR	POPULATION	RATIO MALE/FEMALE	SOURCE OF DATA
1862	300	no data	Gulick (1862)
1874	300-500	no data	Doane (1874)
1900	264	no data	Hainline (1964)
1912	200+	"more women than men"	Girschner (1912)
1920	230	no data	U.S. Navy (1948)
1930	242	no data	U.S. Navy (1948)
1935*	295	no data	U.S. Navy (1944)
1945	238	107/131	Hall & Pelzer (1946)
1946	230	no data	U.S. Navy (1948)
1947	223	103/120	Namoluk Records
1948	226	no data	U.S. Navy (1948)
1949	230	112/118	Namoluk Records
1950	234	no data	USTTPI Annual Report (1950)
1951	235	no data	USTTPI Annual Report (1951)
1952	244	no data	Namoluk Records
1953	241	no data	Namoluk Records
1954	257	132/125	USTTPI Annual Report (1954)
1955	257	133/124	USTTPI Annual Report (1955)
1956	256	132/124	Namoluk Records
1957	253	123/130	USTTPI Annual Report (1957)
1958	246	118/128	USTTPI Annual Report (1958)
1959	no data	no data	no data
1960	279	143/136	USTTPI Annual Report (1960)
1961	301	153/148	USTTPI Annual Report (1961)
1962	309	158/151	USTTPI Annual Report (1962)
1963	314	162/152	USTTPI Annual Report (1963)
1964	322	167/155	Namoluk Records
1965	329	169/160	USTTPI Annual Report (1965)
1966	338	176/162	USTTPI Annual Report (1966)
1967	344	181/163	Namoluk Records
1968	346	182/164	USTTPI Annual Report (1968)
1969	351	183/168	USTTPI Annual Report (1969)
1970	374	199/175	Author's Census
1971	390	212/178	Author's Census

*Namoluk islet=225; Amwes islet=69; Resident foreigner (Okinawan)=1.

TABLE 3

THE POPULATION OF NAMOLUK, 1-1-71

AGE COHORT	MALES			FEMALES		
	Number in TLP	Number in TRP	TRP as a % of TLP	Number in TLP	Number in TRP	TRP as a % of TLP
55 years and over	15	13	87	17	17	100
35 years to 54 years	28	16	57	32	28	87.5
15 years to 34 years	74	22	30	60	36	60
0 years to 14 years	88	81	92	72	68	94
SUBTOTALS	205	132	64	181	149	82
TOTALS			TLP 386			TRP 281

TLP = total living population
TRP = total resident population on Namoluk.

as many children as possible continues unabated on Namoluk. In the past one was fortunate if one half of his children survived to maturity, and people produced as many children as possible to assure someone to care for them in their old age. Namoluk people are glad that most of their children born today survive and few give much thought to the possible consequences of overpopulation. In fact, given the present high rate of migration to Truk and elsewhere, a lack of concern seems justified. Were people on Namoluk to have fewer children than they might, and were migration to continue at its present rate or higher (as seems likely), a population decline on the atoll might set in. Should migration off the island slow down, however, overpopulation may become a problem on Namoluk in the years ahead.

Although Namoluk has a high population density per square mile, the current resident population is hardly straining the productive potential of the atoll. The large taro excavation on Amwes is unused and overgrown and the taro swamps on Tōinom are exploited only slightly. A number of plots in the large taro swamp on Namoluk islet have been given over almost entirely to weeds and other plots are not planted to maximum capacity. Overfishing is not a problem and other local foodstuffs remain abundant.

The effects of venereal disease on small atoll populations have been documented by Lessa (1955), and his conclusions that gonorrhea and syphilis probably account for the great drop in Ulithi's population during the twentieth century seem incontestable. Unlike Ulithi, however, Namoluk's population in the twentieth century has remained relatively stable--increasing steadily except where specific nonvenereal epidemics have caused momentary setbacks. Where the population of Ulithi dropped from 797 to 402 in the years from 1903 until 1946, Namoluk's population dipped only from 264 to 230. This state of affairs is in accord with the findings of Simmons et al. (1965:138)

who report " . . . an overall picture of a stable population in the Truk District, and depopulation in the Palau and especially the Yap districts . . . "

Simmons et al. (1965) believe that loss of men at sea may have important consequences for the breeding population of a small atoll community. While the effects on the gene pool of such a catastrophe can be granted, Lessa has argued convincingly that loss of men at sea has played only a very minor role in atoll population dynamics (1955:170-71). Thus, while a number of Namoluk men have disappeared at sea, this factor does not seem important in the atoll's demographic structure.[14]

Examination of genealogical data for the total known population (TKP) shows multiple births to be rare on Namoluk. Only three sets of twins and one set of triplets are recorded. The triplets all died soon after birth and a set of identical girl twins died in early childhood. Of two sets of boy twins (one identical and one fraternal), only one member of each set has survived.

Variability in reporting population figures for atoll populations such as Namoluk has important implications for those researchers who rely on such figures for comparisons or conclusions of their own. A major problem is that one can never be sure whether a figure cited is for the TLP or for the total resident population (TRP).[15] For example, censes taken by Namoluk island secretaries usually count all people thought to be 'Namoluk citizens'. No uniform set of criteria exists for determining precisely who is and who is not a 'Namoluk citizen', with a consequence that this category varies from one secretary to the next. Some persons regularly counted as 'Namoluk citizens' have been resident off the island more than twenty years and say they have no intention of returning to live on their home island. In spite of this, they are counted in the Namoluk census. Many 'Namoluk citizens' resident elsewhere also are counted in censes taken for the islands where they reside, with a

result that they are counted twice. In similar fashion, people not 'Namoluk citizens' who live on Namoluk sometimes are included in the atoll's population. Double counting of this sort may lead to substantial cumulative error in recording island populations.

Table 4 illustrates the geographical distribution of the 27 percent of Namoluk's TLP who were off the atoll as of January 1, 1971. Many of these persons are attending high school, vocational school or college, and this accounts for all of those on Saipan, Palau, Tol (Truk), Ponape, Hawaii and the continental United States. Three of the four on Guam and seven of the eight on Satawan also are attending school on those islands. Twenty-three of the sixty-six off-island residents located on Moen, Truk, were there specifically to attend high school. Thus a total of 45 percent of the off-island population at the beginning of 1971 were pursuing their education. Eighty-six percent of the off-island population were located elsewhere in Truk District, with 63 percent concentrated in the district center on Moen. Only 7 percent were located outside the Trust Territory.

F. The Historical Setting: the Nineteenth Century

Richard Macy, an American whaling captain, is credited with the first documented sighting of Namoluk by westerners in 1827 (Day 1966:171; Sharp 1960:217), and from his account it is certain that Macy made no contact with the people of the atoll. Early in the next year, Fedor Lütke visited Namoluk aboard the Senyavin while on a Russian scientific cruise around the world. Having spent several weeks in the Lower Mortlocks, Lütke hove to at Namoluk for a few hours, showed Namoluk men about his ship, traded gifts with them, and sailed away later in the day (Lütke 1835; Nozikov 1946). Despite this direct and amicable contact, it is clear that neither Lütke nor any of his crew ventured ashore.[16] Lütke's visit was the first actual contact the

TABLE 4

GEOGRAPHICAL DISTRIBUTION OF NAMOLUK OFF-ISLAND POPULATION ON 1-1-71

Country or Island	Males over age 21	Males under age 21	Females over age 21	Females under age 21	TOTAL
Moen, Truk	25	20	12	9	66
Satawan	4	3	0	1	8
Puluwat	4	0	2	1	7
Etal	2	1	1	0	4
Tol, Truk	0	3	0	1	4
Guam	1	0	3	0	4
Saipan	3	0	0	0	3
Continental U.S.	2	0	0	1	3
Ponape	2	0	0	0	2
Hawaii	0	0	1	0	1
Satawal	1	0	0	0	1
Ulithi	1	0	0	0	1
Palau (Koror)	1	0	0	0	1
TOTAL	46	27	19	13	105

people of Namoluk had with westerners and his mention of gift exchanges makes it clear that steel tools reached the atoll by at least 1828.[17]

By the 1830s, whalers and traders began to ply Micronesian waters in large numbers, and in the year 1830, Captain Benjamin Morrell, aboard the Antarctic out of Stonington, Connecticut passed by Namoluk. In a compendium of his voyages, Morrell has this to say about Namoluk:

> May 14th [1830] --On the following day we discovered three small low islands, being each from three to five miles in circumference, and almost entirely covered with cocoanut [sic] and bread-fruit trees. They were well inhabited with much the same kind of people as the western part of Bergh's Group [Truk] ; having also the same description of canoes, war implements, fishing utensils, and wearing apparel. The islands are all surrounded and connected by a coral reef. They furnish biche-de-mer, pearl and tortoiseshell, and many curious and beautiful shells, valuable for their rarity. These islands extend about ten miles east and west, and about five miles north and south; being situated in lat. 6° 4' north, long. 153° 21' east; and as we could not find them on any chart, or see them mentioned in any epitome of navigation, we concluded that they were new discoveries, and gave them the name of Skiddy's Group, in honour of that worthy and enterprising navigator (Morrell 1832: 388-89).

From his description it appears unlikely that Morrell actually landed on Namoluk. In 1833, an American whaler--the Hashmy under Captain Harwood--called at Namoluk. From a version of Harwood's visit extracted from the Hashmy's log and printed in newspapers in Australia and America, it is clear that members of his crew went ashore on Namoluk. They were the first westerners to do so.

> In coming down from Japan, fell in with a group of islands, not laid down in the charts, in latitude 5° 45' north, and 152° 35' east longitude,--about 50 miles N.W. of Young William's Islands [the Lower Mortlocks] ; the tops of the trees on the islands were visible a considerable distance at sea. I had the crew of the Hashmy on them, refreshing, who were treated with great kindness by the natives. The islands are very thickly inhabited, with plenty of cocoa nuts, vegetables, and such refreshments as are necessary for crews coming from Japan with the scurvy. There is also an excellent harbor on the eastern part of Young William's Islands (Ward 1967:3-4).

Comments such as Harwood's on the excellence of the harbors in the Lower

Mortlocks (Lukunor and Satawan) probably influenced many a captain who might have called at Namoluk to visit the atolls to the south instead.

The available ethnohistorical sources make it clear that Namoluk's initial contact with westerners in the late 1820s and the 1830s was friendly and profitable. Lütke and Harwood both mentioned specifically the kindness of the people of Namoluk and talked of receiving gifts and refreshments--presumably in exchange for articles they had to trade such as the axes discussed by Lütke. By the 1840s, more traders began venturing into the Mortlock area, although the only records of this contact known to exist are the writings of Andrew Cheyne (Cheyne 1852; Shineberg 1971). Cheyne stopped in the Lower Mortlocks twice in 1844 and called there again in 1846 (Shineberg 1971:320-21). On this last trip Cheyne also visited Namoluk, jotting the following brief passage in his journal:

> Hashmy's Group [Namoluk] consists of five low islands, covered with cocoa-nuts and bread-fruit trees, and connected by coral reefs, forming a lagoon inside, to which there is no passage through the reef. The group is fifteen miles in circumference, of a circular form, and may be seen twelve miles from a ship's deck. The reef may be approached to within 300 yards, as no hidden dangers exist. These islands are thickly inhabited by a light complexioned race, who although wearing the mask of friendship, are by no means to be trusted. I touched at this group in July, 1846, and made the centre in lat. 5° 47' N., long. 153° 6' E., by two good chronometers measured from Hong Kong (Cheyne 1852:129).

From this short account it is hard to judge the reception accorded Cheyne by the inhabitants of Namoluk. It appears they were still at least openly friendly toward foreigners, although Cheyne's suspicion that they were not to be trusted might have reflected the islanders' own suspicions about foreigners growing out of a contact of which we have no record.

Following Cheyne's visit, a thirty year gap occurs in the sources before Namoluk is mentioned again. This is not surprising since ethnohistorical research in Micronesia is in its infancy and a great deal of work remains to

be done (Lessa 1962). It is known that many whalers, traders and blackbirders were in the Carolines during the mid-nineteenth century and it is safe to assume that some of them must have found their way to Namoluk. Perhaps as a result of such a visit, Gulick (1862) is able to give us the first recorded population estimate for the atoll, but he does not cite the source of his information.[18]

The historical thread for Namoluk is picked up again in 1874 with an account by the missionary, E.T. Doane, who was at Namoluk in that year aboard the Protestant Mission ship Star from Ponape via the Lower Mortlocks. Quite in contrast to earlier accounts of Namoluk canoes hurrying out to meet visiting ships, Doane reports that no canoe came out and

> . . . as the Star passed along to the lee shore, groups of natives were seen sitting beneath the trees, watching the approach of the vessel . . . This cautiousness of the people not to launch a proa [canoe], and 'come off', indicated fear; and so it was, for here were found those who had been kidnapped by the Carl, and taken to a Fiji plantation (Doane 1874:204).

Obviously, Namoluk had lost her innocence in her contact with the West. Doane goes on to say

> Perceiving their unwillingness to come to the Star, a boat was sent to them. Three friendly natives from Satoan [Satawan] accompanied, and going up to the group, told them who the strangers were--friendly missionaries. A few threw aside all fear, came to us and shook hands, heard a message, bartered a little, and then with a friendly "good-bye," were left (1874:204).

Unfortunately, Doane did not elaborate on whether the men he found on Namoluk who had been kidnapped by blackbirders were from Namoluk or from some other island, nor does he provide information on how they reached Namoluk from Fiji. It appears likely, on the basis of this cursory evidence, that the blackbirder Carl raided Namoluk sometime in the 1850s or 1860s and carried off a number of Namoluk men to Fiji.[19] Confirmation of this possibility must await further ethnohistorical research in Micronesia.

In addition to the native names Namoluk and Namoilam, Namoluk Atoll has been referred to as Harvest, Hashmy, and Skiddy Island, and these names all derive from the atoll's early contacts with whalers and explorers. Harvest was the name of Richard Macy's ship, Hashmy the name of Harwood's vessel, and Skiddy was the name Benjamin Morrell bestowed on the atoll. Early sources also record Mokor as a possible alternate name for Namoluk (Findlay 1886:993; Gulick 1862:362).

G. The Historical Setting: the Church and the Transition to the Twentieth Century

The year before Doane's visit to Namoluk--1873--marked the advent of Protestant mission activity to the Lower Mortlocks. Native teachers from Ponape, under the supervision of American missionaries sponsored by the American Board, established churches on Satawan and Lukunor Atolls and were received with enthusiasm (MH 1876:309). In spite of this successful beginning in the Lowers, native missionary teachers did not reach Namoluk until December 1, 1879, when a young Ponapean couple, Julius and Lora, were landed there (MH 1880:175). By this time the people of Namoluk had completed a church building and had been clamoring for mission teachers for more than a year (MH 1879:218). Julius and Lora had good success in their efforts on Namoluk, though hampered by ill health. Julius quickly learned the language (closely related to, but not mutually intelligible with, Ponapean), and by the end of 1880 the Protestant Church on Namoluk numbered thirty-six baptized members and had four ordained deacons (MH 1880:265; 1881:18, 269, 271). By the end of 1881, with the Namoluk church membership standing at fifty, Julius and Lora were forced to return to Ponape for reasons of poor health, and they were replaced by another couple from the Ponape mission training school (MH 1882:221).

At this point, enthusiasm for the new religion seemed to level off, though new converts continued to be won. By 1886, Namoluk had yet another native teacher--a native of Pingelap Atoll named Joram who remained until 1888 (MH 1886:311, 337; 1888:300). Following a year on its own, the Namoluk congregation received a replacement for Joram in the person of " . . . a brother of Jimina [the mission teacher at Satawan] . . . (MH 1891:370)."

After this initial period of conversion and success in the Mortlocks, the church encountered a period of decline that coincided with a focus of mission attention on the new field of Truk Lagoon, political problems with the German colonial government and depleted operating funds. Nevertheless, the Mortlocks had provided a springboard for the successful missionization of the islands of Truk proper during the 1880s. Truk had been avoided assiduously because of its deserved reputation for dealing fiercely with foreign intruders. By 1901, it was noted that the Namoluk church was able to support its own pastor, although the church building was said to be in a dilapidated condition (MH 1901:413, 415). Of particular interest from an anthropological point of view are the terse statements that appear in the Missionary Herald for 1904 and 1905 concerning Namoluk. Apparently, a native religious revitalization movement swept the island and Christianity reached its low point following its introduction twenty-five years earlier:[20]

> As Namaluk [sic] was omitted last year in the annual tour, we made that our first stopping place. It was a sad story there, for almost all of the professed Christians had gone back to the painting of their bodies and the heathen dance in the hope of attaining favor with the [German] government, and but a very small company were able to sit down with us at our Lord's table. Those who had thus yielded to the temptation to deny their Lord were very desirous of still being counted Christians and of partaking with us the emblems of his broken body and shed blood; but we were of one mind in telling them that this could not be allowed until there was evidence of repentance and the putting away of former things that they might be the true children of God (MH 1904:251).
>
> At Namaluk [sic] the people have forsaken the way of life, and most of

> them have turned back to the ways of this world. The teacher does not seem to influence the people at this place, and the children join in dancing and show no interest in coming to school (MH 1905:196).

It seems clear that the American missionaries at the time did not comprehend the phenomenon that was occurring on Namoluk, and it seems equally clear that Namoluk people had embraced only the superficial elements of the new faith. Certainly, with only one-third of the population of the Mortlocks numbered as church members by 1903, the native religion remained very much alive and influential (MH 1903:159). Further evidence that this was the case is provided by Girschner (1912), who worked on Namoluk circa 1910 and collected considerable data on traditional religious beliefs.

All of this early mission activity in the Mortlocks and on Namoluk was by Protestants. Not until 1911 were the first two Catholic priests sent to the Lower Mortlocks (Hezel 1970:223), and not until 1949 did the Catholic faith gain a foothold on Namoluk (personal communication with William Rively, S.J.).

Toward the end of the German period in Micronesia (1914), the Namoluk church came under the influence of the Liebenzeller Mission, a German Protestant mission organization that began to supplant the American Board. A couple from the Protestant mission headquarters in the Lower Mortlocks on Oneop Island, Lukunor Atoll, was sent to lead the Namoluk church and remained on Namoluk until their death around 1918. They were followed by another Oneop couple, and this man headed the Namoluk church until his death in 1947. The church was then led on an interim basis by a Namoluk man who perished in a sailing canoe accident while on his way to Oneop in 1955 for his ordination as a native pastor. In 1957, the present Namoluk Protestant pastor (from Pis Losap) and his wife (from Moen) assumed their duties which they continue to the present.

With a great deal of initial opposition from the Protestants, the Catholic Church was established on Namoluk in 1949. Currently, a Namoluk man is catechist

and the congregation counts nearly one-third of the atoll's populace among its members.

A futile effort to establish a Seventh Day Adventist Church on Namoluk in the 1950s was made by a Namoluk man converted to that faith on Truk. Failing to make inroads into either the ranks of the Catholics or the established Protestant Church, this attempt at proselytization was dropped and the man subsequently returned to the Catholic Church.

H. The Historical Setting: Colonial Governments All in a Row

The United States acquired Micronesia in battle during World War II from Japan, who in turn had seized the islands in a bloodless military takeover from Germany at the onset of World War I. Germany acquired her interest in Micronesia from Spain, the first colonial power to lay claim over the islands.

The Spanish period in Micronesia (officially 1886-1899) wrought few changes on Namoluk. Except for the growth of Protestant mission activity described above, life on the atoll followed a relatively undisturbed pattern. In some measure, Namoluk's geography protected her people from the tremendous ravages of island populations elsewhere in the Pacific through the introduction of diseases such as smallpox, measles and influenza. With no ship passage into the lagoon, and with natural channels difficult to maneuver even by boat, Namoluk never became a regular port of call for the whalers and traders who frequented the Carolines in the nineteenth century. Add to this the proximity of Lukunor and Satawan Atolls with their spacious anchorages a mere fifty miles to the southeast, and it is little wonder that few captains bothered with Namoluk. As with the whalers and the missionaries, the major commercial ventures (notably the Jaluit Gesellschaft) in the Mortlocks during the nineteenth century focused on the Lower Mortlocks, and Namoluk escaped relatively unscathed.

In German times (1899-1914), a trader, remembered only as "Jack" set up shop on Namoluk, buying copra in return for trade goods, and by 1907 a French trader, Pierre Nedelec, was actively plying the Mortlocks aboard his eight ton schooner. The Germans encouraged men to sign on as contract laborers to work on the phosphate islands of Nauru and Angaur and quite a number of men from Namoluk did so. But while some men traveled far away in the employ of German companies with traders, and while contact with missionaries and colonial officials was greater than ever before, Namoluk society continued to function in much the way it had in the pre-contact period. It was during the German administration that the first anthropologists to study Namoluk language and culture conducted their research (Girschner 1912; Krämer 1935).

In sharp contrast to the earlier colonial administrations, changes during the Japanese period (1914-1945) were rapid, direct, lasting and numerous (Moos 1971). Regular shipping schedules were established and a cash economy was introduced. Travel throughout Micronesia for Namoluk men accelerated, with many men going to work for the Japanese on Angaur or Ponape. For the first time, foreigners became permanent residents on the atoll for long periods and married Namoluk women.[21] Access to material goods and store bought foods increased dramatically. An appointed chief was established by the Japanese to run the island's local government, ushering in the slow but steady decline of traditional leadership on the atoll.[22] With the introduction of a cash economy, buying and selling of land for money appeared. Education--though limited--was made available to substantial numbers of young men and women who, in the 1920s and 1930s, left Namoluk to attend Japanese-run schools on Oneop and on Dublon, Truk. Two Namoluk men achieved the highest education attainable under the Japanese, graduating from the special carpentry school on Koror, Palau.[23] In short, the Japanese introduced Namoluk to the modern

world.

As in earlier periods, the Japanese continued the practice of concentrating attention on the Lower Mortlocks and Namoluk remained a mere way station between the more important centers on Truk and in the Lowers. Commercial activity on Namoluk remained negligible throughout the Japanese period and consisted only of a copra-buying concession and a small-scale lumber mill operated by an Okinawan resident on the atoll.

No Japanese military garrison ever was stationed on Namoluk nor were fortifications of any kind erected.[24] Richards (1957:17) erroneously reports that eighteen Japanese naval personnel were removed from Namoluk in October, 1945, by a United States search and evacuation party. Conversations with numerous Namoluk informants present on the atoll at that time make it clear that no Japanese military were on Namoluk when the Americans came ashore.

Namoluk's only direct contact with World War II was when American fighter aircraft dropped three bombs on the reef and strafed a sailing canoe in the lagoon during the extensive aerial campaign against Truk and the Lower Mortlocks in 1944. Though frightening people badly, this attack caused no deaths or injuries and only minor damage to property. The heaviest inroad of World War II on Namoluk was an indirect one: conscript labor. Constructing roads, airfields and bomb shelters, and growing food for the Japanese military garrisons, a number of Namoluk men died and many others were debilitated by the long and extremely arduous labor required of them.

From a strictly local point of view, the most significant event during the Japanese period on Namoluk was the abandonment of Amwes islet as a habitation site. Although no archaeological data are available, Namoluk oral history has it that Amwes and Namoluk islets both had been inhabited from the first settlement of the atoll. These two islets are close in size (77 acres

and 69 acres) and both have substantial taro excavations. Each of the two islets boasted a church, two named villages, numerous canoe houses, and its own localized descent groups. In spite of these similarities, Namoluk islet always has had a larger population, and unlike Etal Atoll (Nason 1970), Namoluk Atoll has never been divided into two political districts.

In the short span of approximately two years from 1937-1939, an epidemic suddenly and inexorably raged through the Amwes settlement.[25] At least 80 percent of the Amwes population (fifty or sixty people) died at this time. The survivors, and some who were to die soon afterwards, straggled over to Namoluk islet bringing the disease with them. Many people on Namoluk islet also took sick and died at this time although the disease did not run rampant through the entire community as it had on Amwes. Salvaging what they could, the people of Amwes abandoned their home to the weeds, the birds and the pigs. The large taro swamp fell into disuse until today it is filled with a thick, thriving stand of trees. Amwes has never been recolonized.

Lasting since the end of World War II, the American period essentially has followed the Japanese example on a reduced scale. The cash economy, with copra as its mainstay, has been continued and shipping service to and from Truk providing trade goods, passenger service and copra buying has been maintained. Mission activity has received a new impetus in the post-war period that has led to the introduction of Catholicism on Namoluk mentioned above. Educational opportunities have increased sharply and an elementary school has been established on Namoluk with Namoluk citizens as teachers. Especially worthy students have left the island for high school on Truk. Health care services have been built up from nothing to a quite adequate system. A Namoluk man was trained by the Navy as a corpsman and has been employed by the Trust Territory government and provided with a dispensary in which to work on

his home atoll. A woman has been schooled in midwifery and has returned to apply her skills. Yaws--a perennial scourge through the late 1940s--has been completely eradicated with antibiotics. Serious cases of illness have been sent to Truk for hospitalization. Democratically elected local governmental offices have been introduced to supplant the Japanese appointed chief and the council of elders. Wage employment has continued to be available on Truk for the disgruntled, the energetic and the adventuresome. Salaried civil service positions have been created on Namoluk by the Trust Territory government, leading to the rise of inequities in income that formerly did not exist on the atoll. Material goods have increased in availability and variety.

Paralleling the Amwes epidemic as the most significant event of the Japanese years, the 1958 typhoon that smashed Namoluk has assumed a similar role during the American administration.

The Eastern Carolines fall on the extreme eastern edge of the typhoon belt in the northwest Pacific and the people are not as prepared psychologically and culturally for typhoons as are the inhabitants of the Western Carolines (Nason 1967). When they are hit, therefore, disruption is often greater and readjustment may take longer.

On May 24 and 25, 1958, Typhoon Phyllis, with winds over 100 miles per hour, passed just north of Namoluk causing extensive damage. Information provided by the United States Navy indicates that approximately 90 percent of the coconut trees on the atoll were destroyed (Slusser and Hughes 1970). Physical damage to Namoluk, in brief, was as follows:

> Practically 75% of all trees were completely uprooted. The remaining 25% were mere stumps sticking 15 or 20 feet into the air. The damage to homes and community buildings was complete. Fortunately only one person was lost during the storm. Destruction of the islands' canoes was complete (Davis 1959:13).

Prior to Phyllis, the last typhoon to strike Namoluk was sometime in the

nineteenth century. The typhoon of March 27, 1907, that laid waste the Lower Mortlocks and caused over 200 deaths did only minor damage on Namoluk (Anonymous 1907:864), and the same was true for the typhoon of early December, 1935 (U.S.Navy 1944:6).

In the aftermath of Phyllis, almost 100 percent subsistence was given Namoluk people by the Trust Territory government in the form of rice, flour and C-rations for well over a year. Soon after the typhoon, traditional ties and obligations brought canoes from Etal and Oneop laden with taro and coconuts. Möch and Kuttu in Satawan Atoll and Lukunor Island in Lukunor Atoll sent taro and breadfruit to Namoluk aboard the Catholic mission ship.[26] At the behest of the late Petrus Mailo, Mayor of Moen, who came to inspect Namoluk after Phyllis, islands in Truk Lagoon sent taro, pandanus and preserved breadfruit.

The Agriculture Department on Truk began a gardening and coconut replanting program on Namoluk and materials were provided by the government to rebuild forty-three homes, a school, government house, community building, and island office.[27] Eight months after the typhoon the following report was made on the status of rebuilding the atoll:

> Progress...at Namoluk has been extremely fast....The replanting program is well under way and is ahead of schedule. The "two year" rebuilding program will be completed in one year. The morale of the people...is extremely high--partly because they have made such excellent progress on their canoe rebuilding, which means so much to them. Namoluk has completed nine large sailing canoes...(Davis 1959:14).

The social consequences of typhoons for island communities have received attention from Lessa (1964), Nason (1967) and Schneider (1957). All of these writers have stressed that the true measure of a natural disaster of this kind is not in its casualty rate or in the amount of physical destruction it causes, but rather in the disruption of social and emotional relationships

that it entails. Within the obvious constraints of ecology and the preexisting cultural kit, a severe typhoon such as Typhoon Phyllis on Namoluk may be thought of as giving the people a clean slate on which to redraw their lives.

The idea of a typhoon providing a new beginning--of a storm accelerating the pace of cultural changes already in motion--has been explored in detail by Lessa (1964) for Ulithi, an atoll much like Namoluk. The extent of physical destruction caused by Typhoon Ophelia on Ulithi was very similar to that brought on by Typhoon Phyllis on Namoluk. But what is of real interest here is that many social changes that occurred on Ulithi post-typhoon in 1960 had their exact counterparts in the immediate post-typhoon years on Namoluk.

On both atolls, women abandoned traditional dress style--topless with a wraparound skirt--in favor of western-style dresses that covered their breasts. On both atolls, imported lumber, tin and cement replaced home grown woods and thatch as standard building materials for peoples' homes. On both atolls, the residence pattern for houses shifted from dispersed homesteads to settlements clustered together. On both atolls, the typhoon introduced a greater reliance on store bought foodstuffs, e.g., rice, flour and canned meat, perhaps as an outgrowth of the typhoon relief food that had been provided. On both atolls, the importance of cash in the local economy increased strikingly and the number of local stores grew apace.[28] On both atolls, a realignment of political power was set in motion with younger men playing an increasingly active role in local politics. On both atolls, greater inequalities in wealth than hitherto had been present sprang up in conjunction with the rising importance of cash. On both atolls, a trend toward advancing the interest of the nuclear family over that of wider extended kinship groups was intensified. In sum:

> The winds and waves of the...typhoon...not only caused widespread

> physical changes on the tiny atoll but also dramatically transformed the social organization and traditions of the islands. They swept away old ways as well as trees. In doing so they stimulated social changes already in progress before the storm and at the same time provided a more dynamic way of life to cope with the program of reconstruction (Lessa 1964:46).

Namoluk has known of the western world for more than 150 years, but it has only been in the early decades of this century that the modernization process set in. With only minor modification, most of the changes chronicled by Nason (1970) for Etal Atoll in great detail hold true for Namoluk. In the years following Typhoon Phyllis, changes in Namoluk life have come at an ever-faster pace.

I. The Historical Setting: Contemporary Namoluk

Namoluk in 1972 is in many ways a self-contained unit. In many other respects, however, the atoll is but an appendage of Greater Trukese society whose heart is the district center of Moen. It is this paradox between self-sufficiency and dependency and the stresses this paradox engenders that best describes contemporary Namoluk society.

Namoluk is an outer-island, hinterland community (Mason 1971; Spoehr 1960). As such, the atoll is only indirectly exposed to the dramatic social upheavals that have characterized and sometimes plagued the district centers of Micronesia during the 1960s and early 1970s. Moen, Truk--the district center and port-town to which Namoluk is tied--acts as a filter and a buffer for new ideas and new ways.[29] The more disruptive aspects of culture clash evident on Moen have yet to trickle down to Namoluk.[30]

For secondary education, employment, excitement, and health care services, Namoluk people look to Moen. For radio news, mail, shipping, a market for copra, and a stream of material goods, Moen is the source to which Namoluk's inhabitants turn. When transportation to and from Moen by government field trip ship is delayed--as it often is--felt needs on Namoluk become acute.

Cigarette smokers must skimp, hoard, or do without. Bottle-fed infants face a threat of no powdered or canned milk. Motorboats lie silent under the palms for want of gasoline. Underwater spearfishing at night halts for lack of batteries. School is reduced to half-day sessions because there is no U.S.D.A. rice and flour to feed the children lunch. Anthropologists fret because there is no mail. Life on Namoluk, as it is lived in the 1970s, is predicated on regular contact by ship with Moen.

Moen acts like a magnet for people in the hinterland. Spoehr (1960, 1963) has pointed out rightly that Pacific island port-towns show many of the same patterns that characterize early stages of urbanization the world over. One such pattern is for more and more young people from Namoluk and other outer island communities to be drawn to Moen. As the years go by, fewer and fewer of these young adults return to live on their home islands. Those who complete high school have little alternative but to remain on Moen or move to some other port-town in Micronesia if they want to find wage employment and use their education, as nearly all of them do. There are only eight salaried civil service positions (six schoolteachers, one health aide, one agricultural agent) on Namoluk, and all are held by Namoluk people nowhere near retirement with little intention of moving. Given this state of affairs, the prospect is that outer islands such as Namoluk increasingly will become the backwaters of Micronesia as their talented and able-bodied young people flock to the district centers. At this writing, the gap between Micronesian port-towns and their surrounding hinterlands is growing ever-wider (Mason 1971).

Loss of many young adults to the bright lights of the "city" creates problems for a community like Namoluk. Because more men than women leave the island permanently, the balance between the sexes on the atoll is thrown awry (see table 3). One result of this is that a greater number of women who

choose to remain on Namoluk must either seek a spouse from off-island and convince him to return with them or remain unmarried. That this is a growing problem is shown by a greatly increased number of children born out of wedlock to Namoluk women in recent years (table 5). This situation is exacerbated further by a growing tendency for Namoluk young adults (especially young men)--in spite of very strong pressures to the contrary--to seek a spouse from off-island. In the past, the overwhelming majority of Namoluk off-island marriages were with people from other islands in the Mortlocks. In the last two decades, with Namoluk's expanding ties to the district center, however, Truk has replaced the Mortlocks as the main source of off-island spouses.

To compensate for the exodus of young adults from the community, extended families on Namoluk are banding together with more distant kin in order to form viable household units in which there are enough able-bodied persons to do the necessary work. In spite of an increased desire for cash and an extensive coconut replanting program copra production for the atoll has gone down. Taro plots fall into disuse or disrepair as older people come to rely as much on gifts of money, rice and canned foods from their children employed on Moen as they do on the land.

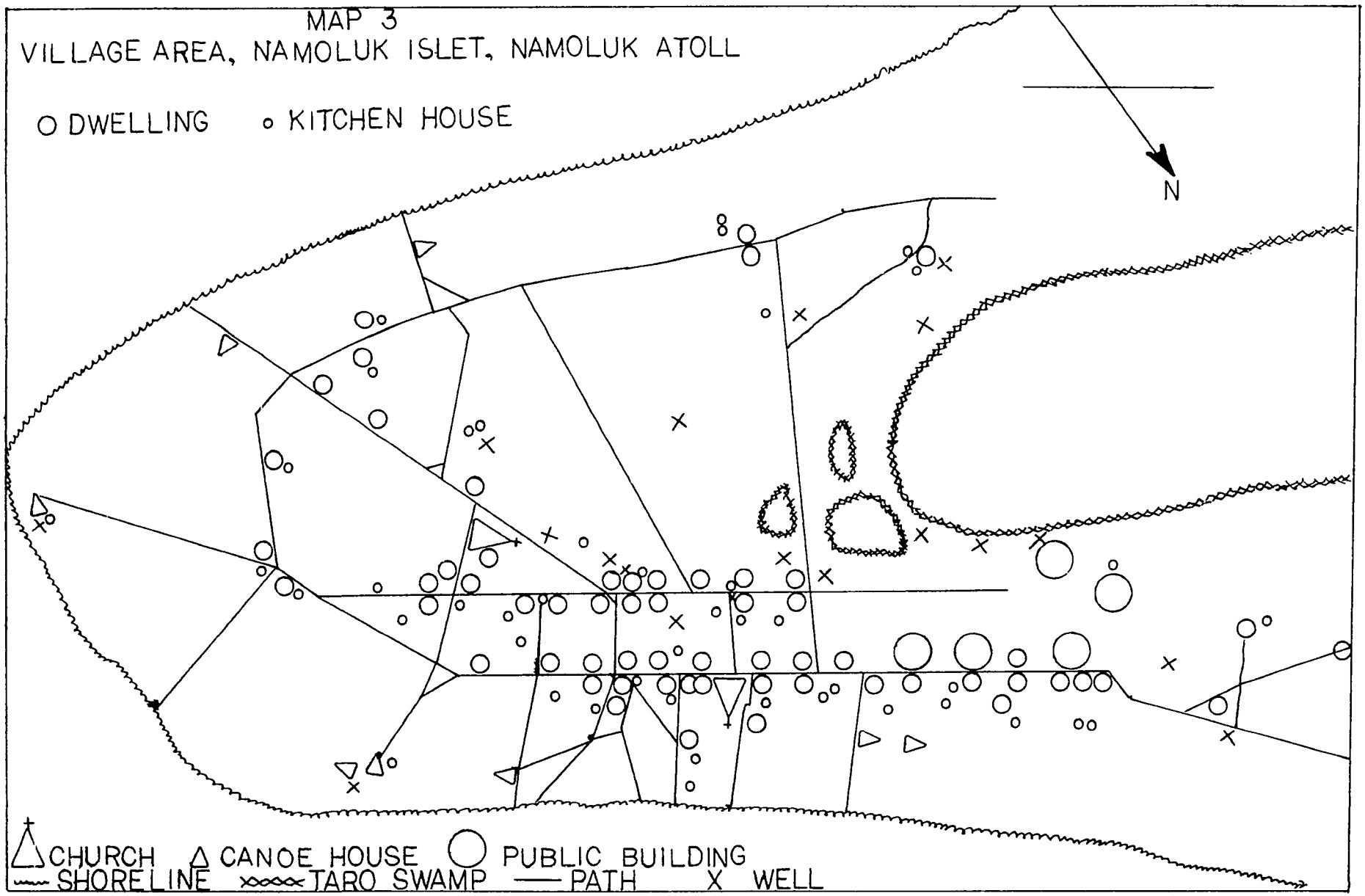
In spite of such problems, life on the atoll in 1972 is still good and young people in the district center say they would return if only there were salaried work. Identification with and commitment to Namoluk by her citizens--young and old--remains very strong. For those who remain behind on Namoluk today, what is life like?

The entire resident population of the atoll lives clustered together in three named but otherwise undistinguished village communities on the northeastern end of Namoluk islet (map 3).[31] Most people sleep in the neat, square

TABLE 5

NUMBER OF NAMED CHILDREN BORN OUT OF WEDLOCK ON NAMOLUK BY GENERATION

Generation of Child's Mother	Total Number of Children Born	Total Number Born Out of Wedlock	Total Number Born Out of Wedlock as a Percent of Total Number Born
4th ascending	204	8	4
3rd ascending	253	9	3.5
2nd ascending	231	14	6
1st ascending	141	26	18.5
TOTAL	829	57	7


MAP 3
VILLAGE AREA, NAMOLUK ISLET, NAMOLUK ATOLL
O DWELLING
o KITCHEN HOUSE
N
CHURCH
CANOE HOUSE
PUBLIC BUILDING
SHORELINE
TARO SWAMP
PATH
WELL

wooden houses with corrugated tin roofs that were erected following the 1958 typhoon and that are raised about three feet off the ground on wooden pilings. Wealthier members of the community have built cement houses sporting linoleum floors and glass-louvre windows in recent years, while a few families still choose to live comfortably in traditional style thatch houses. Everyone cooks in a separate kitchen house (mosoro), usually built in the old style. Seven canoe houses (fäl) punctuate the lagoon shore, continuing to serve as comfortable meeting places for the men of the island.[32] Both the Protestants and the Catholics worship in new cement church buildings, and the A-frame Catholic Church erected in 1968 is especially striking. The large cement community meeting house was rebuilt following the typhoon, and is the focal point for weekly island meetings and other community activities. Passing by a wooden dispensary building, one comes to the Namoluk elementary school complex: two large wood and tin classroom buildings with cement floors and two smaller cooking houses surrounding an open grassy playfield. Adjacent to this is the municipal house, in which the island's shortwave radio transceiver is kept. Seven small, locally-owned and operated general stores, located in peoples' homes, service the needs of the community for canned foods, cloth, candy, soap, kerosene, cigarettes, and other now essential items. These stores purchase new merchandise with each visit of the government-run field trip ship.

On a typical day, one or two bingo games are in full swing while radio station WSZC blares country-western music and Trukese love songs.[33] Children age six and above are reciting their lessons in the schoolhouse. A group of men has just returned from an early-morning troll for tuna beyond the reef, and the catch is being divided, distributed and sold at one of the canoe houses. Some women are cooking the day's food--breadfruit, taro or rice--while others hike out on the reef at low tide to search for an octopus or some small fish

for dinner. A group of men prepares to sail across the lagoon to Amwes to gather and husk copra nuts and to see if any breadfruit are ripe. Pre-schoolers wander about freely, exploring their world and playing childrens' games. The pace of everything is leisurely and relaxed.

Idle time--a certain monotony--is a problem on Namoluk and this is among the reasons many young people leave for the bars, movies, poolhalls and general hubub of Moen. Drinking--though illegal by island law--is frequent and drunken behavior with occasional fisticuffs is common among young men. The standard drink is "yeast," a rather foul brew of baker's yeast, sugar and water, allowed to ferment a few hours, and sometimes flavored with coffee or chocolate. Idle time is a major reason that the mindlessness of bingo is endured hour after hour by Namoluk adults, even though they lose money consistently in this game. Bingo is an excuse to socialize and gossip and a way to while away the hours.

This monotony is broken suddenly whenever a ship visits the atoll. All is then frenzied activity, anticipation, comings and goings, new merchandise, money from copra, and news from the world beyond the reef. Over a period of twenty months from December, 1969--August, 1971, government vessels called at the atoll on an average of more than once a month.[34]

Copra is the mainstay of Namoluk's participation in a cash economy. Although nearly everyone on the atoll continues to live at a subsistence level, all who are able gather, husk, cut, dry and bag copra before every ship. A great deal of time and effort and approximately 300 ripe coconuts result in one 100 pound bag of copra that sells for $5.50. No one on Namoluk gets rich making copra.

The first locally owned outboard motorboat came to Namoluk in September, 1970. Since then three other men have bought boats and motors and the

beautiful sailing canoes are rapidly falling into disfavor. While only the rich on the atoll can afford such a luxury, it is clear that the motorboat (long a fixture on Truk) has come to stay on Namoluk.

Both churches hold twice daily services that are well-attended, and nearly everyone is in church on Sunday morning. The churches are focal points for much social activity, and each congregation prepares its own Christmas and Easter feasts. The Protestant Church sponsors two youth groups--kinder for pre-teens and Jugenbund for those ages thirteen to thirty.

The atoll is governed by an elected magistrate, secretary, treasurer, judge, three policemen, and a six man council. In addition, three men serve as elected village foremen or 'bosses' and the island elects a representative to the Truk District Legislature. The traditional clan chiefs continue to exercise some influence in political affairs, but they possess no effective administrative or decision-making power in the political arena. The political torch on Namoluk has passed to a younger generation.[35]

In 1972, Namoluk citizens are scattered widely from their tiny atoll. The community has a recent history of educational excellence and achievement unparalleled by any similar community in Truk District, and quite a few young people are attending school outside of their district. Namoluk stands as a miniscule outer island that has cast its lot with the modern world. Its isolation and smallness notwithstanding, the atoll's horizons have expanded far beyond what the eye can see looking out over the reef. It is to an investigation of kinship on this enigmatic blend of coral, copra, colonialism and community that we shall now turn.

III. THE KINSHIP SYSTEM

A. Kinship Terminology

The Namoluk kinship system is a variant of the Crow type that is found throughout Greater Trukese society and on Ponape (Fischer 1957; Murdock 1948). Normally, kin terms are used only in reference and personal names are used in address.[1] The set of kinship terms in use on Namoluk, together with their English translation labels, is listed below:[2]

Namoluk Kinship Term	English Gloss
inei	'my mother'
samei	'my father'
pwii	'my same sex sibling'
mŏngei	'my opposite sex sibling'
nai	'my child'
pwuluwei	'my spouse'
ŏŏsei	'my same sex sibling-in-law'

Both men and women on Namoluk refer to men in higher generations of their own clan as 'sibling'. Women in higher generations of one's clan are referred to as 'mother' by men and women alike, and 'mothers'' husbands are called 'father'. Men refer to members of their own clan in lower generations as 'sibling', whereas women refer to such persons as 'child'. Men and women of the same generation of a clan refer to each other as 'sibling'. All descendants of the men of one's clan are referred to as 'child'.

All members of one's father's clan are referred to as 'parent', regardless of generation or speaker's sex. All immediate offspring of men in one's father's clan are one's 'siblings', without concern for generation.[3] Children of such 'siblings' are called 'child' by women. Men refer to the children of such 'brothers' as 'child', but refer to such a 'sister's' children as

'sibling'.[4]

Both men and women refer to their own spouse as pwuluwei. In addition, the spouses of one's 'same sex siblings' are called 'spouse', as are the 'same sex siblings' of one's own spouse. Men and women alike refer to their same sex siblings-in-law as bösei, and this term also is applied to the 'opposite sex siblings' of one's own spouse. Persons of either sex call their parents-in-law 'mother' and 'father', and parents refer to their childrens' spouses as 'child'.

Briefly, it holds that 'siblings' of anyone ego calls 'parent' can be referred to as 'parent' by ego, the 'siblings' of anyone ego calls 'sibling' are ego's 'siblings', and the 'siblings' of anyone ego calls 'child' are all ego's 'children'. In similar fashion, the children of anyone ego calls 'spouse' or 'same sex sibling-in-law' are referred to by ego as 'child'.

The parent terms presented above can be modified, when necessary, to achieve greater specification. Should one wish to indicate that he is referring to a grandparent, he will use the terms inálapei and samálapei, which may be translated loosely as 'my grandmother' and 'my grandfather'. Literally, they mean 'my older mother or father' from lap 'older' or 'bigger'. A stepparent relationship can be specified by the terms inalápei 'my stepmother' and samalápei 'my stepfather'.[5] These terms derive from the word naulap 'take as a stepchild'.[6]

Often more than one kinship term is applicable between ego and a given alter. This circumstance is called no fiti or no fiti fengen 'mix together' or 'be together' (i.e., they are both applicable). When a 'mix together' situation exists, ego usually will refer to alter by the kin term based on their closest relationship. For example, if a man may call a woman 'spouse', 'child' and 'mother', let us assume he calls her 'spouse'. This is because she is married to his lineage 'brother'. The man can call her 'child' because she is the child of his subclan 'brother', and he can refer to her as

'mother' because she is of the same clan as his father; however, the two terms based on these more distant kinship connections are not used by the couple in regular discourse. Should the woman and the man's lineage 'brother' divorce, the man would begin referring to her as 'child' again--the term by which he referred to her before her marriage.

When a 'mix together' relationship exists in which the degree of kinship connection is of equal closeness a dilemma is posed: a female calls another female of her father's clan 'mother'. If ego is a member of clan X, descended from a man of clan Y, and alter is a member of clan Y, descended from a man of clan X, ego and alter are 'mother' to each other, i.e., ego is her 'mother's' 'mother'.[7] Namoluk people consistently resolve such dilemmas on the basis of age. The older woman of the pair will call her younger relative 'child', and the younger will call her elder kinswoman 'mother', in keeping with the difference in their ages.

In addressing two or more people on Namoluk who are related as 'parent' and 'child', their relationship may be stressed by use of the word naunau 'give birth to'. As a case in point, a man and his father's lineage 'brother' (hence the man's 'father') might be asked, "Met aua ruomen naunau aua föri ikei?" 'What are you two related as 'father' and 'son' doing here?' Quite often, the term for 'formal friend', pwiipwii, is extended in a like fashion to refer to two or more people who are closely related as same sex 'siblings', and thus a woman and her lineage 'sister' might be addressed, 'you two pwiipwii'. In this case, pwiipwii is used to specify 'sibling' relationship where people are not related as natural or adoptive siblings.

Unlike Truk, where cross-cousins may be called 'sibling' in some contexts and 'parent' or 'child' in others, on Namoluk cross-cousins are never classified as 'siblings'. Cross-cousins are either called 'parent' (father's sister's

sibling'. When this occurs a 'parent' or 'child' becomes a 'spouse'.

The application of kinship terminology to different categories of relatives has a direct consequence for peoples' behavior through a respect and avoidance pattern called apwaro 'stoop' or 'crouch'. This behavior is required once a man has amwän 'become a young man' or a woman has afapuil 'become a young woman' in a chonom 'puberty ceremony'. 'Stoop' behavior is required only toward others who have undergone the 'puberty ceremony'. Ideally, this ceremony is performed for girls around the time of their first menses and for boys at the onset of adolescence, and it marks a person's availability as a sexual or marital partner. It is at the time of the 'puberty ceremony' and afterwards that young men and women are instructed in matters of incest and exogamy by their same sex parents.[11]

Women come under a greater number of 'stoop' restrictions than do men. In the presence of all her 'opposite sex siblings', a woman must (1) stoop or crawl, always keeping her head lower than theirs; (2) avoid entering any house where an 'opposite sex sibling' sleeps, whether or not he is present; and (3) avoid drinking from the same vessel from which an 'opposite sex sibling' has drunk or eating food that has touched his mouth.[12] A woman also must 'stoop' toward her 'sons' once they have 'become young men'.

In contrast to the above, a man is only required to 'stoop' toward his 'daughters' once they have 'become young women'. 'Stoop' restrictions between grandmothers and grandsons are not as strict as those between mothers and sons. Although a grandmother stoops in the presence of her daughter's son, she may enter his sleeping quarters with impunity, may drink from the same vessel, and may stroke his head if he is ill--something no other woman who calls him 'child' may do.[13] On the other hand, a grandfather must 'stoop' toward his daughter's daughters as though they were his own daughter. Members of both

child), 'child' (mother's brother's child) or 'spouse' (both of these). Swartz (1960, 1962) was first to draw attention to the fact that in Truk Lagoon cross-cousins may sometimes be called 'sibling'. Later, in an unpublished paper, Goodenough (n.d.) has taken up this matter on the basis of new data gathered on Romónum in 1964. He concludes that kinship usage in Truk Lagoon may be changing from a Crow pattern to a Hawaiian pattern, although the bulk of his data show a Crow pattern to be the common one.

This difference in kin term usage between Truk Lagoon and Namoluk becomes comprehensible when the systems of marriage are examined. Numerous statements exist in the literature (Caughey 1970:213-16; Fischer 1957:122; Goodenough 1951:102; Murdock and Goodenough 1947:333) that in Truk cross-cousin marriage is either totally prohibited or extremely rare.[8] On Namoluk, in striking contrast, cross-cousin marriage is preferred and actively sought.[9] The strongest injunctions against incest and endogamy on Namoluk are with one's opposite sex siblings, both natural and classificatory (see Marshall:n.d.b).[10]

Accordingly, to classify one's preferred spouse as 'sibling' in some contexts would be to introduce an internal inconsistency into the rules governing the marriage system. If one can never marry a 'sibling', and a cross-cousin is sometimes a 'sibling', it follows that one can never marry a cross-cousin. This is in fact the situation as revealed by kinship usage on Truk. But on Namoluk people do marry their cross-cousins most of the time! It has been shown above in another context that on Namoluk the principle of 'mix together' permits one to classify the same alter as 'parent' or 'child' under some circumstances and 'spouse' under others. Classification of cross-cousins as 'parent', 'child', or 'spouse' on Namoluk operates according to the rules of 'mix together' terminology: a cross-cousin is a 'parent' or a 'child' until and unless he becomes one's own spouse or the spouse of one's 'same sex

sibling'. When this occurs a 'parent' or 'child' becomes a 'spouse'.

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sexes 'stoop' as a sign of respect or politeness in the presence of chiefs or persons holding positions of authority in the modern political system of the atoll and the District.

B. Clan, Subclan and Lineage

Namoluk people distinguish three categories of matrilineal kinsmen in describing their kinship universe. These categories are eu aramas 'one people', eu fütük 'one flesh and blood', and eu tetelin aramas 'one line of people'.[14] 'One line of people' is encompassed by 'one flesh and blood', and both of these are contained in the category 'one people'. All three of these kinship categories also are called eu ainang 'shared matrilineal descent'. When Namoluk people use the word ainang, the particular context indicates to which of the above three categories of matrilineal kin it refers. Because such subtle usage proves difficult for a non-native speaker of the language to grasp, I have found it preferable to work with 'one line of people', 'one flesh and blood', and 'one people'. For pedagogical purposes, I have chosen to translate the Namoluk concept 'one flesh and blood' by the anthropological label "subclan." Henceforth, when I use "subclan," it refers specifically and only to 'one flesh and blood'. In like manner, I translate the Namoluk notion of 'one people' by the anthropological concept of one "clan," and 'one line of people' by the anthropological concept of a "matrilineage."[15]

The category 'one flesh and blood' is a group of people, arrayed in one or more matrilineages, who maintain a belief of being popusengi emen choput 'descended from one woman' in the comparatively recent past, although exact genealogical relationship may have been forgotten. Anyone who is a member of one's 'flesh and blood' is believed to actually share physical substance with oneself, and is thereby a "close relative."

'Flesh and blood' on Namoluk does not include one's full set of "close

kin," however. There is a difference between "close matrilineal kin" ('flesh and blood') and "close kin" who fall outside this category. As I use it, "close kin" is a term that may vary slightly from one individual to the next, depending always on the kind and quality of relationships a person has with his relatives at any given time. "Close kin" includes both consanguines and "sociological" kinsmen, e.g., affines, step-kin, adoptive relatives and 'formal friends'. As a general rule, for any ego, "close kin" includes:

(1) Members of ego's own matrilineage.
(2) Members of ego's father's matrilineage.
(3) Members of ego's spouse's matrilineage.
(4) Other "sociological" kinsmen, e.g., client members of ego's lineage, step-kin, adoptive kin, and 'formal friends'.

It must be emphasized that this list is not necessarily exclusive and that "close kin" is a flexible category that takes shape for any individual largely on the basis of situational and circumstantial considerations. To cite but one example, "distant kin" may redefine each other as "close kin" when they migrate to Moen and have only a few relatives on whom they can rely.

The difference between "close matrilineal kin" and the more general "close kin" may be illustrated by the following example. Full or uterine siblings are considered to be each other's 'flesh and blood', but siblings sharing the same natural father with mothers from two different 'flesh and blood' are not. When asked to name their natural brothers and sisters, Namoluk people do not mention voluntarily those siblings with whom they share only the same father; uterine siblings with different fathers always mention each other. Namoluk people recognize a father's role in paternity, and a father may refer to his children as fütükei 'my flesh and blood'. This term, however, is asymmetrical between father and children--a father may call his children 'my flesh and blood', but they cannot reciprocate in kind. This anomaly draws attention to the male role in paternity while simultaneously reemphasizing the matrilineal nature of 'flesh

and blood'.

Examination of Namoluk rules of incest and exogamy makes clear the fact that the category 'flesh and blood' is the kernel of Namoluk kinship (see Marshall n.d.: b). 'Flesh and blood' is inviolate with respect to marriage, and ideally inviolate with respect to sexual relations. Members of one's matriclan form a shell around this kernel--a second layer of kin. The reach of the incest taboo and rules of exogamy on Namoluk extend to this second layer, and beyond, to include close patrilateral kin and "close kin" who fall outside one's lineage (such as brother's children). Incest and exogamy are considered more reprehensible the closer they approach 'flesh and blood'.[16]

The members of each subclan share a tradition of direct common ancestry, even though the precise genealogical connections among them may have been forgotten. Sometimes a subclan is a single large matrilineage in which the exact genealogical relationships among all members are known. At other times, a subclan may consist of several matrilineages that consider themselves to be related directly in the comparatively recent past. The members of a subclan may all be located on Namoluk, or the subclan may have branch lineages on one or more other islands. Subclans are not named, are autonomous with respect to each other, and as a rule do not share a tradition of direct common ancestry with other subclans.[17] Members of the different subclans of a clan consider themselves to be only distantly related.

Every Namoluk person belongs by birth or adoption to a named, noncorporate, matrilineal clan. People belonging to the same matriclan subscribe to a myth that they are 'descended from one woman' in the far distant past. This myth includes all people, anywhere, who are members of the same named group. For this reason, Namoluk people recognize kinship, in a loose sense, with all persons in Greater Trukese society and as far away as the atolls of the Western

Carolines who belong to their clan. This bond is expressed by saying all members of one clan are 'one people'. The feeling of 'one people' is given as justification for rules of clan exogamy, and as accounting for clan hospitality among relatives on different islands.

There are seven clans represented on Namoluk, ranging in size from 2 to 191 members.[18] The names of these clans, along with the number of male and female members of each as of June 30, 1971 are given below (see table 6).

Some clans on Namoluk consist of only one matrilineage; their members can all trace relationship to a common known ancestress. In other cases, where the number of living members of a clan on the atoll is small, its members may act together as a subclan even though some of them are known to share no direct relationship in the past. This often happens in instances where client lineages have been incorporated from other islands.[19] Clans that consist of only one matrilineage or only one subclan normally have their own canoe house and their own clan chief and may share land.[20] The two largest clans on the atoll present a different situation. Wenikar, which includes nearly one half of the TLP, is subdivided into five subclans, each with its own canoe house, its own chief, and its own lands. Sör clan, the second largest on Namoluk, is divided into two subclans. The remaining five clans are each organized into only one subclan, with a result that there is a total of twelve subclans on the atoll.

Clans and subclans are composed of matrilineages, and it is only at the lineage level that people regularly behave as part of a corporate group. Members of the same matrilineage usually share land, and they can always trace descent to a common, remembered ancestress.[21] Very large matrilineages may be built of several descent lines each with its own shared land, and each a potential new lineage in its own right. Sometimes the English loan word

TABLE 6

NAMOLUK POPULATION BY CLAN MEMBERSHIP AND SEX

Clan Name	No. of Males	No. of Females	Total Members	Percent of TLP
1. Wenikar	103	88	191	49
2. Sör	32	27	59	15
3. Katamak	31	27	58	15
4. Fenimei	20	14	34	9
5. Söpwunipi	13	7	20	5
6. Souwon	7	10	17	4
7. Inemarau	1	1	2	1
Imwo	3	4	7	1.5
Masalö	1	0	1	.5
TOTAL	211	178	389	100

word faamali 'family' is applied to a matrilineage or a matrilineal descent line; the term mwalö 'matrilineage', in use in the Lower Mortlocks, is not employed on Namoluk.

Namoluk lineages range in size from one to forty, with fourteen members the average size for the atoll's twenty-seven surviving lineages. Subclans vary in size from a high of eighty-one members to a low of two, with thirty-four the average number. The sizes of lineages, subclans and clans are always waxing and waning from one generation to the next, and a lineage may easily die out in the space of one or two generations. Four lineages--Sör-2c, Fenimei-c (Tum), Söpwunipi-c and Wenikar-2e--have gone extinct within the memory of living informants, and genealogical data for them are still available.[22] Six more Namoluk lineages--Sör-2b, Inemarau, Wenikar-1a, Wenikar-2d, Wenikar-4b and Wenikar-5b--will cease to exist on the death of their present members for a lack of fertile women. Other lineages--e.g., Katamak-b, Söpwunipi-a, Wenikar-2c--have seen their numbers dwindle to a lone surviving woman, only to blossom again when she proved exceptionally fertile. Only one subclan--Sör-2--is threatened by the possibility of dying out, and the only clan that faces imminent extinction on the atoll is Inemarau.

Client members--especially fertile women--frequently are recruited specifically to prevent a lineage from dying out. Thus Sör-1a lineage has taken in client descent lines from Etal, Oneop, and Kuttu, and Sör-2a has taken in a client descent line from Lukunor, all the survivors of which have returned to Lukunor. Katamak's strength has been bolstered by addition of Katamak-c (formerly Souwonure clan) as a client lineage from Puluwat, and Fenimei-b has absorbed members in a client descent line (formerly Soualei clan) from Pis Losap. When Söpwunipi-c lineage verged on extinction, Söpwunipi-b was brought from Etal to fill the depleted ranks. Wenikar-1 and Wenikar-5

subclans likewise have been reinforced by client lineages from Oneop.

Namoluk also has provided client lineages to other islands in Greater Trukese society. The largest Sör-1 lineage on Nama today is descended directly from a Sör-1a woman who emigrated there six generations ago from Namoluk to help repopulate the island, after a massacre by Losap warriors who were aided by Alfred Tetens and his gun-toting crew circa 1870 (Mitchell 1970; Tetens 1958). Members of Sör-1a on Namoluk and Sör-1a on Nama continue to assist each other in numerous ways (particularly on Moen), and there have been marriages and adoptions made to support this connection.[23] Fenimei-b has sent an entire descent line to Puluwat to resuscitate Fenimei clan on that atoll, and Söpwunipi-a has contributed a descent line to Möch, its ancestral home. Wenikar-1c has a thriving branch on Oneop and Wenikar-2a has similar ones on Etal and Nama. Wenikar-1d and Wenikar-5a maintain close ties with Oneop, to which some members of each of these lineages have returned after immigrating to Namoluk.

According to Namoluk informants, an ideal family contains children of both sexes, although data from a questionnaire administered to all resident adults in June, 1971, show a slight preference for daughters over sons. In this same vein, adoption data show a somewhat greater number of girls (sixty-seven) are adopted than boys (forty-one). Since daughters perpetuate a matrilineage, bring land into the lineage through their childrens' inheritance from their father, and usually reside matrilocally with their parents after marriage, such a preference is understandable. Parents especially take into account the greater probability that a daughter, rather than a son, will continue to reside with them after her marriage, assuring them a measure of security and companionship in their old age. Old people on Namoluk greatly fear abandonment by their children.

The same questionnaire revealed a preference on the part of Namoluk people for an opposite sex sibling over a same sex one. Sixty-eight percent of the respondents chose a sibling of opposite sex, when asked whether they would rather have a brother or a sister. Women express an opinion that a brother will care for them if they become destitute, and will assist them in matters of land, food, money and disputes where "strength" is needed. Men point out that a sister can be counted on to cook and wash clothes for them until they marry or if they leave their wife, and that a sister will reproduce their descent line. The preference for an opposite sex sibling also is in accord with the notion that an ideal family contains both boys and girls. With these facts in mind, it is no surprise that a stated reason for adoption is to obtain an opposite sex sibling for one's child.

C. Kinship as Sharing

"Close relatives" are expected to tumwunuu fengen 'take care of each other' and to alilis fengen 'cooperate'. From the time they are small, children are admonished to share with their relatives. Gifts given one child are passed around for his 'siblings' to use or play with. Few possessions are truly private property on Namoluk. Whenever possible, kinship connections are used to find employment in the district center, to win a scholarship for higher education, and to gain other special favors. The code of kinship is mutual help and cooperation, with group interest placed above individual desires.

"Close matrilineal kin" usually möngö chu 'share land' at the lineage or subclan level (see chapter 5). In a large subclan, one or two pieces of land may be designated 'shared land' to which all members of that subclan have use rights, with all other land held by members of the subclan owned individually or by groups of siblings. A process of fragmentation of 'shared land'

during the past century has reduced the total amount of land held in joint estate, and today 'shared land' is largely symbolic. To share land with someone is, by definition, to share "close kinship."

"Close relatives" normally live together on one pei 'homesite' or on adjacent homesites. Until the village pattern on Namoluk was reorganized radically during the rebuilding following the 1958 typhoon, "close kin" generally lived together in a single large dwelling. Today no more than three nuclear families live in any one dwelling, although it is common for several 'sisters' and their husbands to live in adjacent single family dwellings and to cook together in one cookhouse. A strong pattern of living uxorilocally with the wife's parents or sisters (or on the wife's land) continues on Namoluk. Virilocal residence is a less common but acceptable alternative. Neolocal residence, with no close kin on the same or adjoining homesite, is very rare. Living together implies kinship in the Namoluk view, and this feeling carries over to adoptive siblings, step siblings and foster siblings when the relationship has endured for a long time. Genealogical considerations notwithstanding, marriage or sexual intercourse between people raised together on one homesite are viewed as "like" incest.

Shared food on Namoluk symbolizes kinship and friendship. "Close kin" continuously take each other gifts of food, especially prepared taro, breadfruit and fresh fish. Gifts of food (e.g., preserved breadfruit and salt fish) and sent to "close relatives" living temporarily or permanently off the island on every ship that calls at the atoll. "Close kin" working in the district center send gifts of rice and canned food to their relatives on Namoluk at every opportunity. To eat together conveys feelings of "close relationship" because the produce has come from shared land or from labor that is the outgrowth of past assistance among kin. To eat together regularly

on Namoluk is to participate in a recurring kinship communion.

"Close relatives" not only often share the same dwelling, but they also share all manner of other material possessions. Such sharing occurs via loan, outright appropriation, and joint ownership. If a "close relative" asks to borrow an item, it is very difficult to refuse him. To do so without good reason puts a strain on the relationship. To refuse repeatedly, regardless of the reason, is to repudiate or deny the kinship tie involved. Often a kinsman such as wife's brother, a sibling, one's parent or child will just angai 'take' or tüngor 'ask for' one's possession, with no intention of returning it. Such requests or fait accompli are difficult to turn down for the same reason that it is hard to refrain from loaning something to "close kin." Near relatives often pool labor, talent, and money to make or purchase something to which they all have joint and equal rights. Things as varied as a canoe, a pig, capital for a store, or money for the education of a kinsman are handled in this way. To regularly share material possessions or money means to share kinship on Namoluk.[24]

"Close kin" pool their labor and work together on Namoluk. "Closely related" women cook, tend each other's children, make handicrafts together, and accompany each other to the taro patch. "Closely related" men assist each other in fishing, gathering breadfruit, husking copra nuts, and other heavy tasks. Joint labor is especially notable among relatives living together in one household.

A demonstration of proper kinship sentiment is made by a person's kin when he is taken ill. At the onset of serious illness, all of a person's kin offer money and prayers in church on the sick person's behalf. Other special church offerings are made by parents at the birth and at the baptism of a child, and by a person himself when he returns safely to Namoluk from an off-

island journey.

Political factions on the atoll are composed largely of lineal and affinal kin. Despite the slow disintegration of traditional, kinship-based political roles, and the substitution of introduced, elected positions, kinship continues to play a decisive part in local-level politics. Considerations of kin relationship rather than those of merit are decisive in most local elections. Shared political interests are usually--though not always--shared kinship interests expressed in the political arena.

Adoption and fosterage are an integral part of the pervasive pattern of sharing among "close kin" on the atoll. Children (and sometimes adults) are adopted for companionship, love, pleasure, a sense of personal worth and fulfillment, and a variety of economic reasons. To give one's kinsman a child in adoption or fosterage is simply one more way for expressing "close kinship" by sharing valued resources (see Marshall: n.d.c).

From the above, it must now be obvious that genealogical connection, in and of itself, is insufficient to determine whether two people are "close kin." Shared land, shared residence, shared material possessions, and common political cause are among the situational determinants of "close kinship." When very close ties develop between persons who trace no genealogical relationship, a pwiipwii 'formal friend' relationship may be established. Pwiipwii is a reduplicated form of the kinship term pwii 'my same sex sibling', however, one may have a 'formal friend' relationship with a member of either sex. In such cases, a "friendship" relationship is turned into a "kinship" relationship, and one behaves toward his 'formal friend' as he would behave toward a 'sibling'.[25]

It is thought important on Namoluk for a "close kinswoman" of the husband to move in and be with his wife at or immediately following birth of a child. Since men are not permitted to be present at childbirth, and since a post-partum

taboo on sexual intercourse between a man and wife for a month or two after birth remains in effect, this kinswoman acts to represent the husband's lineage. If a man's mother is no longer living, his natural or adoptive sister will represent him; otherwise a close lineage 'sister' will be asked. Failure of a man's lineage to provide a female representative at the birth of his child, without good reason, may be interpreted to mean they do not recognize the child, and this can have significant repercussions for the alliance between the two groups. One week after the birth of the child, the women of the husband's side throw a feast for all the women of the wife's side, plus any other pregnant women in the community regardless of their kinship affiliation.

IV. THE MARRIAGE SYSTEM

A. Mechanisms of Alliance

The Namoluk system of marriage is founded on bilateral cross-cousin marriage, sibling-set marriage, and the sororate and levirate. Cross-cousin marriage is preferred and consciously arranged by parents.[1] Where sufficient data exist for a determination to be made, 63 percent (264/417) of Namoluk marriages for the TKP are with cross-cousins. When all marriages for the TLP are considered, 60 percent (106/174) are with cross-cousins. Thus the ideal of cross-cousin marriage is reached in nearly two-thirds of the cases. Table 7 shows the distance of relationship for all cross-cousin marriages on Namoluk. It is clear that a majority of such marriages are with distant, classificatory cross-cousins, rather than with natural father's sister's daughters or mother's brother's daughters. This is to be expected in a small population such as Namoluk, where a requirement that one marry his natural father's sisters's daughter or mother's brother's daughter would be impossible to maintain due to limitations on the number of people alive or of marriageable age at any given time (Kunstadter et al. 1963).

A stated reason for preferring cross-cousin marriage on Namoluk is that it keeps land "in the family." Normally, one receives a substantial inheritance of land from his father. Since one's father is always of a different clan (except in the very rare case of clan endogamy), cross-cousin marriages carried on for more than one generation have the effect of passing land back and forth between two lineages, subclans or clans. Interlineage cross-cousin marriages in successive generations especially are sought, since the lineage is the normal land holding corporation.

Another reason Namoluk people say they prefer cross-cousin marriage is that this sort of marriage reduces the strain between a man and his wife's

TABLE 7

DISTANCE OF RELATIONSHIP FOR NAMOLUK CROSS-COUSIN MARRIAGES*

RELATIONSHIP	No.	Percent of TOTAL
1. Natural FZD or MBD	14	5
2. Natural FZDD or MMBD	13	5
3. Classificatory F'Z'D in father's lineage or classificatory M'B'D where M'B' is a member of ego's lineage.	26	10
4. Classificatory F'Z'D in father's subclan or classificatory M'B'D where M'B' is a member of ego's subclan.	55	21
5. Classificatory F'Z'D in father's clan or classificatory M'B'D where M'B' is a member of ego's clan.	154	59
TOTAL	262	100

*Two cases of cross-cousin marriage not recorded here concern couples whose opposite sex parents are 'siblings' directly descended from men in the same clan.

relatives. A married man is, to a certain extent, at the beck and call of his wife's brother.[2] If, however, one is descended directly from a man of his wife's lineage, one can refer to one's wife's brother as 'father'. The normal relationship between a father and his children on the atoll is one of nurturance rather than one of stern authority. Older children often ignore their father's commands and one may appropriate his father's possessions with some impunity. Given these circumstances, it is easy to see that when a wife's brother is also a 'father', one may choose to disregard his demands. In cases where a husband is not directly descended from a man in his wife's lineage, repeated disobedience of this sort could result in his wife's brother telling him to leave and might end in divorce. When one is descended from a man in his wife's lineage, however, one cannot be chased off his wife's land because one also has latent rights to the land via his natural father. Hence cross-cousin marriage gives a husband a stronger position vis-a-vis his wife's relatives than non-cross-cousin marriage.

Namoluk people consider it desirable that a set of natural or classificatory siblings in the same lineage all marry into the same lineage, subclan or clan. This will be called "sibling-set marriage." Where the genealogies record two or more natural siblings to have married, 68 percent (509/749) have taken partners in sibling-set marriage. Where two or more classificatory siblings in the same lineage have married, 77 percent (703/914) have engaged in sibling-set marriage (see table 8). As with cross-cousin marriage, the intention in sibling-set marriage is to create an enduring alliance between two land holding groups and to establish strong ties of sentiment among affinal kin. This kind of marriage also has an effect of keeping a sibling-set together as a unit.[3]

Namoluk informants point out that if a man marries into another lineage,

TABLE 8

RELATIONSHIP FOR NAMOLUK SIBLING-SET MARRIAGES

RELATIONSHIP	NATURAL SIBLINGS		CLASSIFICATORY SIBLINGS IN THE SAME LINEAGE	
	No.	% of Total	No.	% of Total
1. Marry Into Same Lineage.	239	32	392	43
2. Marry Into Same Subclan.	109	14	169	18
3. Marry Into Same Clan.	161	22	142	16
4. Marry a Foreigner or Into Different Clans.	240	32	211	23
TOTAL	749	100	914	100

he will give land to his children at the expense of his own lineage's total estate. For this reason, it is desirable that a lineage 'sister' of this man marry into the same lineage, subclan or clan as he did. If she produces offspring, they will receive land from their father, and ideally, the flow of land between the two lineages will be balanced.

The effect of sibling-set marriage for binding already related kin groups even more closely together may be seen by looking at the example of Wenikar-2c and Wenikar-2d lineages. These two lineages in the same subclan are extremely "close" today, not because they are any closer related to each other than to, say, Wenikar-2b, but because of sibling-set marriages in successive generations. Today all members of these two lineages live together on one homesite, cook in one cookhouse, share labor, food, and material possessions, and Wenikar-2d has adopted two children from Wenikar-2c. These sibling-set marriages are demonstrated below:

+4 generation: a Wenikar-2c woman and a Wenikar-2d woman married two full brothers from Sör-2a lineage.

+3 generation: a Wenikar-2c woman and a Wenikar-2d man married a full brother and sister from Sör-2b lineage; a Wenikar-2d woman married a Sör-2a man.

+2 generation: a Wenikar-2c woman married a Sör-2b man and a Wenikar-2d woman married a man from Sör-2 subclan on Oneop.

Following divorce, or the death of a spouse, every attempt is made to arrange a sororal or leviritic marriage--especially if there are children--in order to maintain the previously established alliance. Where Namoluk people have married twice or more, 53 percent (294/547) of the multiple marriages have been sororal or leviritic marriages (see table 9).[4] Sororal or leviritic marriage with a member of the same land holding group as one's previous spouse means that the transfer of land will follow the same path as it would have before the dissolution of the first marriage. Sororal and leviritic marriages are

TABLE 9

REMARRIAGE OF BOTH SEXES IN SORORAL AND LEVIRITIC MARRIAGES FOLLOWING DIVORCE OR DEATH OF A SPOUSE ON NAMOLUK ATOLL

CLOSEST RELATIONSHIP	No.	% of TOTAL
1. Sororal/Leviritic Marriage with Former Spouse's Full or Uterine Sibling.	40	7
2. Sororal/Leviritic Marriage with Former Spouse's 'Sibling' in the Same Matrilineage.	61	11
3. Sororal/Leviritic Marriage with Former Spouse's 'Sibling' in the Same Subclan.	65	12
4. Sororal/Leviritic Marriage with Former Spouse's 'Sibling' in the Same Clan.	128	23
5. Non-Sororal/Leviritic Multiple Marriages.	253	47
TOTAL	547	100

believed to be particularly important to assure the welfare of children who have lost a parent. The notion is that a closely related stepparent will take better care of his stepchild than someone only distantly related or not related at all.

Very frequently a person's marriage simultaneously will be a cross-cousin marriage, a sibling-set marriage and a sororal or leviritic marriage. There are continuing efforts to establish and sustain marital alliances on the atoll, and it is expected that marriages will be arranged so as to effect a long-term balance of land given and land received among lineages, subclans and clans. Cross-cousin marriage, sibling-set marriage, and the sororate and levirate all help fulfill this expectation.

B. Off-Island Marriage

Since at least some off-island marriages operate outside the Namoluk marriage alliance system, they are considered less desirable than marriage with another Namoluk person. Table 10 shows that a majority of 135 respondents who were asked whether they would rather marry someone from Namoluk or from somewhere else chose the former. Interestingly, a greater percentage of the women questioned chose a Namoluk person over someone from off-island, in spite of the fact that 58 percent of all off-island marriages have been made by women.

Rules of clan exogamy and problems of demographic scale make it imperative that some members of every generation seek spouses from other islands. Traditionally, Namoluk has drawn most off-island marriage partners from other islands in the Mortlocks--especially from Etal, Oneop, and Nama, islands to which Namoluk has many ties of descent and formerly ties of military alliance. All of the clans on Namoluk are to be found elsewhere in the Mortlocks, and thus it is usually a fairly simple matter to fit another Mortlockese into the

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5. Non-Sororal/Leviritic Multiple Marriages.	253	47
TOTAL	547	100

TABLE 10

RESPONSES TO THE QUESTION, "WOULD YOU RATHER MARRY SOMEONE FROM NAMOLUK OR A PERSON FROM SOMEWHERE ELSE?"

PLACE	MEN No.	Percent	WOMEN No.	Percent
1. Namoluk	37	62	57	76
2. 'Foreigner'*	10	16.5	10	13
3. Truk Lagoon	3	5	2	3
4. Mortlocks	3	5	1	1.5
5. Puluwat	0	0	1	1.5
6. Unspecified	7	11.5	4	5
TOTAL	60	100	75	100

*Any person from outside of Truk District

marriage system on the atoll. Even if the Mortlockese spouse is from a clan not present on Namoluk, his father is likely to be from a clan that is represented, and therefore, he will have relatives on Namoluk. In recent years, however, as more and more Namoluk people have emigrated to the district center on Truk, increasing numbers of marriages have taken place with Lagoon Trukese (see table 11). In many instances, spouses of Namoluk citizens from islands in Truk Lagoon are from clans that do not exist in the Mortlocks. Although, in a few cases, Lagoon Trukese can be fit readily into the Namoluk system, on the whole this is much more difficult to accomplish than when another Mortlockese is involved.

While it is perhaps a bit hasty to reach any definitive conclusions, it appears that certain Namoluk lineages are in the process of forging alliances with clans on Truk. Members of Wenikar-4a lineage have made three current marriages on Udöt, two in Sapenö clan. Similarly, members of Sör-1 subclan have made two current marriages with members of Alangaitau clan on Moen. Sixty-four percent (16/25) of the total marriages between Namoluk and Truk Lagoon are current marriages, and an even higher percentage have been made by people who are still alive. By contrast, only 21.5 percent (16/74) of Namoluk marriages with the rest of the Mortlocks are current marriages. It is anticipated that the number of Namoluk marriages with Truk will far outstrip those with the other Mortlocks within the current generation.

At present, however, for most purposes the Namoluk marriage system is a closed system. By this is meant that the vast majority of marriages occur on the atoll with another Namoluk person. Out of a total of 949 marriages recorded in the genealogies, nearly nine out of ten (87 percent--820/949) are on-island marriages. Primarily for this reason, it is felt justifiable to ignore off-island marriages in the structural analysis to follow.

Even though it is essentially a closed system, Namoluk interclan marriage

TABLE 11

NAMOLUK OFF-ISLAND MARRIAGE PATTERN

ISLAND AND ISLAND GROUP	Number of Marriages Subtotal	Total	Percent of Total Off-Island Marriages
1. Lower Mortlocks		59	46
a. Oneop	35		
b. Etal	16		
c. Möch	3		
d. Lukunor	3		
e. Satawan	1		
f. Kuttu	1		
2. Truk Lagoon		26	20
a. Welö (Moen)	19		
b. Udöt	3		
c. Romönum	1		
d. Fanapanges	1		
e. Fönö	1		
f. Tolowas (Dublon)	1		
3. Upper Mortlocks		15	12
a. Nama	12		
b. Losap	3		
4. Western Islands		8	6
a. Puluwat	8		
5. Namonuitö Islands		4	3
a. Ulul	4		
6. Outer Islands, Yap District		4	3
a. Satawal	3		
b. Ulithi	1		
7. Orientals (Japanese and Okinawans)	4	4	3
8. Occidentals (Americans and "Westerners")	4	4	3
9. Ponape	3	3	2
10. Pingelap Atoll	2	2	2
TOTAL		129	100

alliances are often reinforced by off-island marriages (see table 12). For example, 50 percent of Wenikar-2a off-island marriages have been with Sör clan, and 80 percent of Wenikar-2b off-island marriages have been with Sör or Souwon clans. Wenikar-2a has its strongest alliance on the atoll with Sör-1a, with lesser ties to the three Sör-2 lineages, and Wenikar-2b's alliances on Namoluk are exclusively with Sör and Souwon (see chapter 6). The off-island marriages made by Wenikar-1b and Wenikar-1c lineages with Soumöch and Soufa clans on Oneop are explainable in a somewhat similar way. Wenikar-1c lineage on Namoluk split five generations ago, with one descent line remaining on Namoluk and the other migrating to Oneop. The line that traveled to Oneop has since intermarried extensively with Soumöch (13/38 marriages) and Soufa (6/38 marriages). Thus marriages by Namoluk Wenikar-1b and Wenikar-1c with Soumöch and Soufa on Oneop (55 percent of their total combined off-island marriages) conform to and should be viewed as part of their close relatives' marital alliances on that island.[5] Wenikar-1d lineage on Namoluk migrated to the atoll in the +2 generation from Oneop where it, too, has close links to Soufa.

Occasionally, off-island marriages are made with the children of Namoluk men who have married off the atoll in a previous generation. In most cases such people have inherited rights to land on Namoluk from their father, and therefore, they fit very smoothly into the atoll's alliance system regardless of their natal clan. There are five such marriages recorded in table 12.

Table 13 illustrates that 51 percent of all off-island marriages, where clan membership is known or is a relevant issue (116/129 marriages), are with persons whose clans are represented on Namoluk. This figure does not take into account situations such as that described for Wenikar-1b and Wenikar-1c above or cases where the off-island spouse's father hailed from Namoluk. Thus, in the strictest sense, only a little less than one half of the off-island marriages

TABLE 12

NAMOLUK ATOLL OFF-ISLAND MARRIAGES SHOWING LINEAGE OF NAMOLUK PERSON AND CLAN OF OFF-ISLAND SPOUSE WHERE KNOWN

NAMOLUK LINEAGE	TOTAL	NO. OF MARRIAGES AND CLAN OF OFF-ISLAND SPOUSES
1. Sör-1a	3	1 Alangaitau; 1 Wenikar; 1 Soumöch.
2. Sör-1b	4	1 Alangaitau; 2 Wenikar; 1 Wiitä.
3. Sör-2a	2	1 Fenimei; 1 Wenikar.
4. Sör-2b	2	1 Tum; 1 Souwon.
5. Katamak-a	3	2 Wenikar; 1 Souwon.
6. Katamak-b	5	2 Wenikar; 2 Sör (1*); 1 Söpwunipi.
7. Katamak-c	5	1 Wenikar; 1 Achau; 1 Masalö*; 1 Pwol; 1 Katamak.+
8. Katamak-d	1	1 Wenikar.
9. Fenimei-a	2	2 Inaneföt.
10. Fenimei-b	7	1 Inaneföt; 3 Sör; 2 Souyefang; 1 Katamak.
11. Fenimei-c	1	1 Soumöch.
12. Söpwunipi-a	3	3 Sör.
13. Söpwunipi-b	5	2 Sör; 2 Wenikar; 1 Natenafich.
14. Souwon	2	1 Wenikar; 1 Masalö*.
15. Inemarau	2	1 Sör; 1 Söpwunipi.
16. Wenikar-1b	4	2 Soumöch; 2 Söpwunipi.
17. Wenikar-1c	5	2 Soumöch; 1 Soufa; 1 Tum; 1 Masalö.
18. Wenikar-1d	6	1 Souwon; 2 Soufa; 1 Tum; 1 Masalö; 1 Imwo.
19. Wenikar-2a	8	4 Sör; 3 Soufa; 1 Fenimei.
20. Wenikar-2b	5	3 Sör; 1 Souwon; 1 Achau.
21. Wenikar-2c	1	1 Wiitä.

(NEXT PAGE PLEASE)

(TABLE 12, CONTINUED)

22. Wenikar-2d	1	1 Sör.
23. Wenikar-2e	1	1 Söpwunipi.
24. Wenikar-3	2	1 Soumöch; 1 Wiitä.
25. Wenikar-4a	9	2 Sör; 2 Sapenö; 1 Souwon; 1 Katamak; 1 Achau; 1 Söpwunipi; 1 Fesinim.
26. Wenikar-4b	1	1 Souwon.
27. Wenikar-5a	8	4 Soufa; 3 Sör; 1 Fenimei*.
28. Wenikar-5b	4	1 Masalö; 1 Katamak; 1 Achau; 1 Fenimei*.
TOTAL	102	

*Indicates marriage with a person from another island whose father is from Namoluk; in Namoluk parlance such people are afakuran Namoluk 'descended from Namoluk men'.
+For a somewhat complicated reason this marriage is not considered endogamous (see Marshall: n.d. b).

TABLE 13

NUMBER AND PERCENT OF NAMOLUK OFF-ISLAND MARRIAGES BY CLAN OF OFF-ISLAND SPOUSE

CLAN OF OFF-ISLAND SPOUSE	Number of Marriages	Percent of Total Off-Island Marriages	Clan Represented on Namoluk
1. Sör	24	20.5	X
2. Wenikar	13	11	X
3. Soufa	10	8.5	
4. Soumöch	7	6	
5. Souwon	6	5	X
6. Söpwunipi	6	5	X
7. Masalö	5	4	
8. Fenimei	4	3.5	X
9. Katamak	4	3.5	X
10. Achau	4	3.5	
11. Tum	3	2.5	X*
12. Inaneföt	3	2.5	
13. Wiitä	3	2.5	
14. Alangaitau	2	2	
15. Souyefang	2	2	
16. Sapenö	2	2	
17. Pwol	1	1	
18. Natenafich	1	1	
19. Imwo	1	1	

(NEXT PAGE PLEASE)

(TABLE 13 CONTINUED)

20. Fesinim	1	1
21. Marriage in greater Trukese society, but clan unknown.	14	12
TOTAL	116	100

*Tum clan was formerly represented on Namoluk by one small descent line from Etal. This descent line merged with Fenimei on Namoluk (Fenimei-c), lasted three generations, and became extinct.

fall completely outside the Namoluk marriage alliance system.

The affective content of husband-wife relationships on Namoluk runs a wide gamut from great warmth and love to thinly-veiled hostility. On the whole, in comparison to ties with one's own siblings, ties with one's spouse seem generally weaker. It must be admitted that this is an impressionistic observation; no tests or questionnaires were administered on this point. The "unity of a sibling-set" is promoted over the "unity of a conjugal-set" through membership of a husband and wife in different clans and different property holding corporations. Nevertheless, husband and wife are bound together as part of a larger alliance among Namoluk descent groups and marriages are not dissolved lightly. Perhaps this accounts for Fischer's remark (1957:124-25) that divorce is rarer in the Mortlocks than elsewhere in Truk.

Parents often go out of their way to discourage their children from marrying off-island when a suitable spouse from Namoluk is available, and sometimes this discouragement will amount to a command. While a few young people will ignore their parents' wishes in such matters, most of them are anxious to please their parents and will follow their advice. From the Namoluk point of view, the major drawback of an off-island marriage is that the in-laws do not reside on Namoluk. Not only does this mean that the couple may spend a lot of time away from the atoll--especially if the off-island spouse is a woman--but it also means that the parents will have gained very little from the match: the mutual support and regular exchange expected between affinal kin largely will be lost. Stated another way, off-island marriages have very little alliance potential--particularly as this is manifested in day-to-day interaction--and fall beyond the bounds of the Namoluk marriage system. As such, they are not to be encouraged. If rules of exogamy and demographic

constraints conspire to make such a marriage necessary, every effort should be made to seek a spouse from another island in the Mortlocks with which Namoluk already has long-standing ties.[6]

C. The Marriage Relationship

Parents, and particularly one's mother, mother's mother, and mother's sisters, have a very strong voice in one's choice of a spouse. They are equally influential in engineering a divorce if a marriage does not work out to their satisfaction. In selecting a spouse, people not only look at his character and reputation, but also that of his "close kin." Being related to "bad" people can be a decided handicap when hunting for a spouse, regardless of one's own personal qualifications. "Bad" parents are thought to produce "bad" children. Aside from this, a marriage establishes ties not simply between a man and a woman, but between their respective sets of "close kin." If one's "close kin" suspect that one's proposed marriage will lead to recurrent trouble and failure to meet the obligations of affinal kinship, they will do all in their power to prevent it. Furthermore, no one wants his descent line to be tainted by "bad" blood.

The amount of land held by a potential spouse's lineage is another factor taken into account by parents in deciding whether or not to promote a particular marriage. Especially where the human resources of a lineage are greater than its land resources, close attention will be paid to arranging marriages of daughters with men from lineages that are comparatively rich in land. Such marriages provide one means for keeping the key resources of people and land distributed somewhat evenly on the atoll (Cf., Goodenough 1955:80-81).

Traditionally, marriage on Namoluk was by mutual consent of the spouses and both sets of parents. Such a marriage was made public when the couple began living together, and it was not attended by any special ceremony or feast.

Not only does Namoluk traditional marriage go unmarked by ceremony, but there is no exchange of land between the kin groups of the bride and the groom, as is found throughout the Lower Mortlocks with the exception of Etal and Lukunor (Fischer 1958:172, 195).[7] With the advent of Christianity, church weddings have become popular, and a church wedding on the atoll is usually celebrated with a feast put on by the couples' parents. Nowadays, both kinds of marriage are common on Namoluk. Divorce, like traditional marriage, is by mutual consent and is marked by ceasing to live together. In a very few instances of church marriage where divorce comes about, a settlement may be sought in the district courts.[8]

Marriage generally follows the form of serial monogamy. While many marriages endure for life, the typical person marries about twice. Divorce is quite common. Infertile men and women are particularly likely candidates for multiple marriage, and one infertile woman has married six times, another five. Fecundity is highly prized on Namoluk, and sterile women feel unfulfilled when they discover they cannot bear children. Not surprisingly, inability to bear children is given as one motivation for adoption, and both of the women mentioned above have adopted two children.

Until the missionaries brought a halt to the practice in the Japanese period, lineage 'siblings' enjoyed rights of sexual access to one another's spouses at certain prescribed times. These included times when one's spouse was away from the atoll, times when a man's wife was secluded in the menstrual hut (a practice no longer followed on Namoluk), or was unavailable because of a post-partum ban on sexual relations which lasted until the baby could walk, and times when one member of a couple or the other was enjoined from intercourse to assure the efficacy of magic or medicine that had been made on his behalf. In regard to lineage 'siblings' sharing each other's spouses in former

times, note that sibling-set marriage is designed so as to reduce to a minimum the potential conflict growing out of this situation. Related siblings in either cohort shared spouses, just as they shared nearly everything else. Note, too, that ego refers to his spouses's same sex siblings as 'spouse', and that all such persons are potential sexual and marital partners. One carry over of this practice today is that a married person who engages in extramarital sex with his spouse's same sex sibling will not be branded an adulterer if he is found out.[9] While such extramarital exploits are dimly viewed, since the church brands them as adultery even though Namoluk culture does not, the persons who engage in such exploits will not be required to pay indemnity (see chapter 5). All cases of adultery that become public knowledge require such payment.[10]

In the traditional system polygamy was permitted, although it was never common. The genealogies contain six cases of polygyny and only one case of polyandry. Two cases of polygyny were with full sisters, and the case of polyandry was with two uterine brothers.[11] To a certain extent at least, polygyny was indulged in by "big-men," of whom others were afraid and who were in a position to support more than one wife. Three of the six men who married polygynously on Namoluk were clan chiefs, and one of these was also the Japanese appointed island chief for the atoll. The last case of a polygamous marriage on Namoluk was in Japanese times and polygamy is no longer practiced.

Few adults who reach marriageable age on Namoluk do not marry. In the TLP there are six men and twelve women over age eighteen who were not enrolled in school during 1971 and who have never married. Of the six men, five are under age twenty-five and four of these may reasonably be expected to marry within the next few years.[12] Of the twelve women, only three are under age twenty-five and two are over age sixty. Seven of the twelve women have had at least one child out of wedlock. Marriage prospects seem good for only four of

these twelve women.

V. THE LAND TENURE SYSTEM

A. Classification of Resources

A good deal of excellent ethnography on land tenure in Greater Trukese society already exists (Fischer 1958; Goodenough 1951; Nason 1970; Tolerton and Rauch n.d.), and it is not my intent here to duplicate this work. Only a summary sketch of the Namoluk system will be offered, emphasizing the points where it differs from those reported for elsewhere in the district. This sketch will be sufficient for an understanding of how land is woven into the pattern of interlineage alliance on the atoll.

When reference herein is made to "land," this is to be understood as an imperfect English translation of the Namoluk word möngö 'food', 'eat' or 'resources'. Möngö is regularly used as a generic term for the following resources: fanu 'dry land'; pwöl 'taro swamp'; set 'sections of reef'; mae 'stone fish weirs'; mei 'breadfruit trees'; and nu 'coconut trees'. All of these resources may be inherited, bought, sold, or exchanged for labor or other resources or as indemnity for a wrong. In the Namoluk conception, land is of the utmost importance: land is life. Classification of land resources as möngö 'food', the essence of life, underscores this point. To be without land would be to be without food, and to face starvation or great privation.[1] Land on Namoluk is even more precious when one recalls what a scarce commodity it is: the entire atoll amounts to only 206 acres!

Fanu 'dry land' includes all land on all five islets not given over to taro swamp and above the high water mark. Every piece of land on the atoll is named, although most named pieces are fragmented into a number of separate holdings owned by different people. Boundaries between individual holdings and between named plots are marked by trees, rocks, wells, or sometimes low stone walls erected by the owners. Disputes over boundaries are common.

Pwöl 'taro swamp' falls into two categories. There are three true pwöl on the atoll, the largest of which occupies approximately twenty acres in the center of Namoluk islet. The second largest taro swamp is on Amwes and is roughly two-thirds the size of its counterpart on Namoluk islet. The Amwes swamp is not being planted to taro at present, and it would prove a major undertaking to clear it for such purposes again. Even so, the presence of this currently unutilized resource provides insurance against continued rapid growth of the atoll's resident population. A third very small taro swamp is located on Töinom and is harvested and worked only haphazardly. Each taro swamp is divided into named sections, that are in turn subdivided into a multitude of tiny plots owned by different individuals or sibling-sets. No taro swamp that is being actively cultivated is treated as 'shared land' by a subclan or lineage. Boundaries between plots are indicated by water-filled ditches two to three feet in depth. In addition to these three swamps, taro also is grown in a number of mach 'taro pits', which are small excavations near but physically separate from the larger swamps.[2] In sum, no more than one-fifth of Namoluk's total land area is given over to growing taro; total area of taro swamps and taro pits combined is less than forty acres.

The entire reef area of the atoll is divided into thirteen named segments called set, each of which is owned separately.[3] Most of the reef sections are treated as shared land by a lineage; none are held in individual ownership. Built on the reef, usually in natural surge channels, and owned separately from the reef sections on which they are constructed, are thirty-one named mae 'stone fish weirs' and a few small unnamed ones. Like reef sections, fish weirs are commonly treated as shared land by a lineage.

The two major kinds of food trees of perennial importance--breadfruit and coconut--may be owned separately from the land on which they grow. Such trees

are the "small change" of the Namoluk land tenure system. They have a fixed price ($10.00 per breadfruit tree and $5.00 per coconut palm), and they are used commonly to pay for traditional medical or massage treatment or to compensate for services or favors rendered. In two cases, trees even have been given as Christmas presents! Trees owned separately from the substrate out of which they grow are called mei eäeä and nu eäeä, 'owned breadfruit' or 'owned coconut'.

Close matrilineal relatives möngö chu 'eat together' or 'share land resources' either at the subclan level or with other members of their lineage or descent line.[4] Land set aside as shared land at the subclan level is today but a small portion of the total land resources of the atoll. It remains important primarily for its symbolic significance: shared land symbolizes shared kinship. Most shared land is shared at the lineage or descent line level. The land tenure histories reveal a trend of reduction of shared land at the lineage and descent line levels, and an increase in individual ownership over the past century.[5] Regardless of this trend, the common land holding corporation on Namoluk today continues to be a set of natural or adoptive siblings in a matrilineage, and to share land is to share "close kinship."

Twenty-two questions pertaining to land resources were included in a questionnaire administered to all resident adults in June, 1971. In each case, the question was phrased, "If you could have either X or Y, but not both, which would you rather have?" That land maintains its importance over money in the Namoluk scheme of things was demonstrated strikingly when three-fourths of the respondents chose land over money. A taro plot was preferred over a piece of dry land by two-thirds of those questioned, and 80 percent picked a piece of dry land over a reef section. Given a choice between a taro plot or a reef section 90 percent took the former, while two-thirds of the resident adults would rather have one breadfruit tree than three coconut palms.[6] Nearly nine

out of ten respondents chose a piece of dry land over a fish weir. From these responses and other data, it is possible to rank resources on Namoluk according to the following scale of desirability in the eyes of her residents:

(1) taro swamp

(2) dry land

(3) reef section

(4) breadfruit trees

(5) coconut trees

(6) fish weirs

Other questions were designed to shed light on the desirability of land vis-a-vis intangibles such as education and material objects such as a radio. Some surprising results emerged from the responses to these questions. Sixty-nine percent of the people would prefer more education to more land! Quite apparently, education is placed very high in the Namoluk set of values, and it is interesting to recall the great success Namoluk students have enjoyed in gaining admission to high school and college in the past few years.[7] Asked whether they would rather have a salaried job on Moen or more land on Namoluk, 53 percent of those asked said they would take the land. When land was paired with a pig or a radio, nearly nine out of ten respondents chose the land. Hence material goods of this sort--which are desirable but perishable--are not so valued as land. Material objects essential to the food quest, on the other hand, may rank above certain land resources. For example, three-fourths of those questioned would rather own a paddling canoe than a fish weir. The place of education vis-a-vis land is unique. Education is the only commodity, real or intangible, that Namoluk citizens prefer over land.

Respondents were also queried on which of two islets they would rather own land (fanu), if someone were to give them a plot. Results of these questions

show the five islets of the atoll to be ranked by Namoluk people in the following order of desirability:

(1) Namoluk

(2) Tŏinom

(3) Amwes

(4) Lukan

(5) Umap

This correlates perfectly with land area, except for Tŏinom and Amwes which are reversed. This reversal might be explained by two factors: Tŏinom is more accessible to the village area than Amwes and it is superior copra plantation land. In spite of this, however, the greater number of breadfruit trees on Amwes (more valued than coconut palms by respondents), and the potential availability of a sizable taro swamp on Amwes (the most valued land resource) make this ranking difficult to interpret. Since only 55 percent chose Tŏinom over Amwes, it might be best to view these islets as equally desirable in peoples' eyes. Certainly, no other pair of islets comes so close to a fifty-fifty choice when matched together.[8] Nevertheless, the percentages given in footnote 9 show Tŏinom consistently outranking Amwes in comparison with the other three islets.

Given a choice between land on Namoluk Atoll or land in the district center of Moen, 64 percent of the Namoluk adults chose their own atoll. Moen is a nice place to visit, but most Namoluk residents would not choose to live there permanently even if they owned land there. When asked if they would prefer land on Namoluk or somewhere else (unspecified), 69 percent replied, "Namoluk." These data are important because they support the desire to marry someone else from Namoluk instead of someone from off-island. By marrying on the atoll, one is likely to acquire land on Namoluk instead of land on another island. Obviously, Namoluk's citizens have a strong attachment to their own atoll. This

is especially so since many of those who chose land on Moen or elsewhere prefaced their response with, "Since I already have land on Namoluk and I have none there..."

B. Methods of Land Transfer

Table 14 provides tabular data extracted from the land tenure histories on the frequency of transmission of resources on Namoluk from one lineage to another according to the type of transaction.

Liffang 'give as a gift' or 'give as an inheritance' is the most common method of transfer, accounting for 77.5 percent of all transactions. Since concern here is only with interlineage transfers (ignoring transfers between persons within a lineage), the overwhelming number of inheritance gifts recorded in table 14 are gifts from a father to his children. It is interesting to observe that ownership of reef sections and fish weirs nearly always is transferred by inheritance.

Chap 'indemnity' or 'restitution' is paid under a number of circumstances. It is most frequently demanded by an aggrieved party when there has been a divorce--especially if there are children.[9] Broken engagement for arranged marriage also results in payment of indemnity, as does polygamous marriage. In this latter case, the person who has taken a second or third spouse is required to pay restitution to the relatives of spouses to whom he is already married to compensate them for the fact that they must now share their inheritance with another party. In like fashion, grown children may collect restitution from their father if he remarries following death of their mother. If a case of adultery becomes flagrantly open and public knowledge, the wronged spouse will demand indemnity before harmonious relations can be restored. Indemnity also is paid by one party to another in cases of homicide or physical injury of one person by another. Note that dry land and taro plots--

TABLE 14

NAMOLUK INTERLINEAGE LAND TRANSFERS BY TYPE OF RESOURCE AND KIND OF TRANSACTION

NAMOLUK CATEGORY	fanu #	%	pwöl #	%	set #	%	mae #	%	mei eäeä #	%	nu eäeä #	%	TOTAL #	%
1. liffang	780	84	429	80	9	90	41	98	127	58	52	50	1438	77.5
2. chap	53	5½	35	6½	1	10	1	2	6	2	0	0	96	5.5*
3. kamö	43	4½	35	6½	0	0	0	0	31	14	11	10½	120	6.5*
4. paun mor	23	2½	18	3	0	0	0	0	8	3½	1	1	50	2.5
5. luinin angang	17	2	12	2	0	0	0	0	12	6	1	1	42	2
6. akasiwel	12	1	11	1½	0	0	0	0	9	4	1	1	33	1.5
7. paui top	2	¼	1	¼	0	0	0	0	0	0	0	0	3	.5
8. oun rewa	2	¼	0	0	0	0	0	0	21	9½	10	10	33	1.5
9. oun safei	0	0	2	¼	0	0	0	0	4	2	12	11½	18	1
10. luinin pisek	0	0	0	0	0	0	0	0	2	1	10	10	12	1
11. luinin kilisou	0	0	0	0	0	0	0	0	0	0	2	2	2	.5
12. luinin pwe	0	0	0	0	0	0	0	0	0	0	3	3	3	.5
TOTAL	932	100	543	100	10	100	42	100	220	100	103	100	1850	100.5

*Interesting for comparative purposes is the statement by Tolerton and Rauch (n.d.:77) that chap and kamö each accounted for about 5 percent to 15 percent of the average lineage's land holdings on Lukunor in the late 1940s.

the two most valued resources--are involved in a preponderance of indemnity transactions.

Within the last fifty years, kamö 'buying and selling of land for money' (yen or dollars) has been introduced into the Namoluk system. Especially since the 1958 typhoon, sales of land have assumed increasing importance. In earlier years, the price of a piece of land or a taro plot often included material goods as well as cash. Today, however, it is common for such transactions to be made using cash alone. Even though buying and selling of resources has become important on Namoluk in recent years, it has only amounted to 6.5 percent of the total transactions tabulated in table 14. What must be kept continually in mind is that most of these transactions have occurred since the end of World War II. Actually, sales of land for money do not operate independently of the traditional system at all. Rather, they have been brought into conformity with it. Table 15 shows that of all dry land and taro plots sold for cash, less than 10 percent (6/78) have been sold to nonrelatives. In most cases, the parties are quite closely related--often by afakur ('descendants of the men of one clan or subclan') as classificatory siblings or classificatory parent and child (51 percent of the cases). Affinal relationships also play a prominent role in such transactions, accounting for an additional 26 percent of the cases. In table 15 only the closest relationship among principals is listed, though in most cases the principals are related in several different ways. While no reef sections or fish weirs have been bought and sold, note that breadfruit and coconut trees join dry land and taro plots in being frequently transmitted in this way.

Paun mor, literally 'his tired or exhausted hands' is a category of land transaction that repays exceptional kindness--often by someone not bound to perform such an act by kinship obligations. Most commonly, paun mor is used

TABLE 15

TRANSACTIONS INVOLVING SALE FOR MONEY OF FANU AND PWOL ON NAMOLUK ATOLL

CLOSEST KINSHIP RELATIONSHIP BETWEEN BUYER AND SELLER	No. in this relationship	
	Subtotal	Total
1. Matrineal Ties.		8
a. Both are of the same lineage.	2	
b. Both are of the same subclan.	3	
c. One has been adopted by a member of the other's subclan.	1	
d. Both are of the same clan.	2	
2. Patrilateral Ties.		40
a. Both are afakuran the same lineage.*	6	
b. Both are afakuran the same subclan.	5	
c. Both are afakuran the same clan.	2	
d. One is afakuran the other's lineage.	11	
e. One is afakuran the other's subclan.	2	
f. One is afakuran the other's clan.	6	
g. One is afakuran the other's spouse's lineage.	2	
h. One is afakuran the other's spouse's subclan.	1	
i. One of them and the spouse of the other are afakuran the same lineage.	1	
j. One of them and the spouse of the other are afakuran the same subclan.	4	
3. Affinal Ties.		20
a. Both are married into the same lineage.	5	
b. One is married into the other's lineage.	3	
c. One is married into the other's subclan.	7	
d. One is married into the other's clan.	2	
e. One is married into the subclan of the other's spouse.	2	
f. One is married to the other's daughter's adoptive daughter.	1	
4. Formal Friendship Tie.		4
a. They are 'formal friends' to each other.	4	
5. No Kinship Relationship		6
TOTAL		78

*Afakuran means 'descended from men of'.

to express thanks to a person who has nursed one when he is ill. Another kind of "hard" work, normally done by members of one's 'flesh and blood', for which paun mor might be paid, is assistance by a nonconsanguine at a funeral for one's relative. Such assistance might take the form of bathing the body, constructing the coffin, digging the grave, or locating a proper burial spot if the person has died on another island.

Luinin angang means 'price of labor' and refers to resources used to pay someone for his labor on one's behalf. Normally, payment of this sort only comes into play when it is necessary to hire someone with a special skill, such as a canoe builder, carpenter, or spokesman in court. Luinin angang is conceptually one but lexically differentiated from payment for material goods (luinin pisek), payment for knot divining (luinin pwe), payment for thanks or indebtedness (luinin kilisou), and payment for being taught esoteric lore (luinin rong).

Occasionally, people will exchange (akasiwel) a piece of land for a piece of land or a tree for a tree. In only one case recorded was one kind of resource exchanged for another: a taro plot for a piece of dry land.

Paui top is land given a child after he has accompanied one on an off-island journey or made such a journey at one's request. The notion is to "repay" the child for the inconvenience and discomfort of seasickness and homesickness, and to anticipate the danger of travel by canoe in the open ocean. Since nearly all children travel off-island today in the comparative safety of a ship rather than a canoe, adherence to paui top on Namoluk is waning rapidly. In the histories collected, it accounts for only three transactions.

Oun safei 'medical costs' and oun rewa 'massage costs' are linguistically separated but closely related ways for acquiring resources. Oun safei is payment for traditional herbal medicine and oun rewa for massage treatment.

Massage is a form of Trukese medicine, and is important on Namoluk as practiced in midwifery and in the treatment of sprains and broken bones (Cf., Mahony 1970). A look at table 14 reveals that the costs of such treatment on Namoluk are met mainly with breadfruit and coconut trees.

Viewed from a broader perspective, land resources on Namoluk are transmitted along four main channels. First, inheritance and most kinds of indemnity are predicated on the marriage relationship. These resource transactions cover inheritance, divorce, adultery, polygamy, remarriage, and broken engagement. Second, resources are transmitted to compensate for injury, death, special labor or special hardship, and this includes the remaining kinds of chap, paun mor, luinin kilisou and paui top. Third, resources are paid out to secure the benefits of another's rong 'specialized skill or knowledge'. Included here are luinin angang, luinin pwe, luinin rong, oun safei and oun rewa. Finally, resources are sold or exchanged for money, material goods or equivalent resources, and this takes in kamö, luinin pisek and akasiwel.

Adoption plays a small but significant role in the transmission of resources by inheritance. Three percent each of the inheritance gifts of dry land and taro plots were from adoptive parents to adoptive children or between adoptive siblings. One fish weir was given by an adoptive parent to his adoptive child.

Generally, client lineages acquire land by quickly establishing a very strong alliance with a large and land rich lineage. For example, Wenikar-5a lineage has such an alliance with Sör-1a, and Katamak-c has a similar one with Wenikar-4a. Less strong but successful alliances have been established by Wenikar-1d with Katamak-a and Sör-1a, by Fenimei-c (Tum) with Sör-1a and Sör-2a, and by Söpwunipi-b with Wenikar-3. Land acquisition by an immigrant lineage is aided immeasurably when one or more of its members possess specialized

knowledge or skill. Wenikar-1d has acquired a good share of its land through the canoe building skill of its founder's husband, and Wenikar-5a has done well by the carpentry skill of a similar spouse from off-island. Such knowledge or skills notwithstanding, a crucial factor in the acquisition of dry land and taro plots is to have close clan or affinal relatives on the atoll. The importance of such kinship ties is made clear by the case of the immigrant Imwo lineage. In fifteen years on the atoll, this lineage has been singularly unsuccessful in its efforts to buy land on Namoluk, though they have acquired an impressive array of breadfruit and coconut trees as massage payments. Only one member of this lineage--a male--has married on Namoluk. By contrast, both Wenikar-1d and Wenikar-5a have been able to purchase land from clan relatives on Namoluk to supplement the outright gifts of land they received from other lineages in their subclan when they first came to the atoll. Both immigrant Wenikar lineages also have had several women marry men from Namoluk, thereby acquiring land for their children by inheritance. Of interest, too, is the fact that both lineages have given out children in adoption; Wenikar-1d has given five. Several of these adopted children have received an inheritance from their adoptive parents. Imwo lineage has not participated in any adoptions on Namoluk. Unless women of the Imwo lineage marry on Namoluk, and their children acquire resources from their fathers, their prospects for becoming truly landed on the atoll appear dim.

On most islands in Truk Lagoon, and in the rest of the Mortlocks except Etal and Lukunor, an inheritance of land from one's father is normally a small and relatively insignificant portion of one's total inheritance (Fischer 1958: 170). On Namoluk, however, land from one's father is of extreme importance, and usually amounts to a substantial part of one's total inheritance. Subject only to veto by his full siblings, the land one gets from one's father is to

do with as one will.[10] Set against this is land inherited through one's mother and shared land in one's lineage, both of which are subject to the interests of all other members of one's lineage or major descent line.

Land from one's father is critically important because it provides a measure of independence. This is brought out clearly in a situation described by numerous informants. A person who has no land from his father is said to be seu 'humiliated', 'shamed' or 'embarrassed'. In arguments, his tormentor may taunt him by saying, "Get out of here and go collect food from the land your father gave you!" The humiliation felt by this person at such a remark is precisely that it spotlights his dependency and vulnerability.

It is the important role of inheritance from one's father that accounts, at least partially, for the emphasis Namoluk people place on sororal/leviritic marriage when children are involved. Ideally, such marriage assures the flow of land from father's lineage to children as if the original marriage were intact. An unrelated stepfather might feel little or no obligation to provide his stepchildren an inheritance. Often, in cases where an unrelated stepfather fails to provide an inheritance, or where a woman remains unmarried following loss of her spouse, a father's brother will provide for a man's children.

It has been shown that the bulk of land transfers between lineages on Namoluk are a direct consequence of marriage relationships. Inheritance from fathers amounts to 77.5 percent of all interlineage land transactions, and indemnity having to do with divorce, adultery, and so on adds another 5 percent.[11] Thus 82.5 percent of all interlineage land transfers recorded in the tenure histories directly follow from marriage, a threat to marriage or its dissolution. A substantial portion of the remaining 17.5 percent of land transactions, in categories other than inheritance and those cases of indemnity noted above, can

be shown to rely on marriage relationships too. For an example, see those relationships based on affinal links governing land sales in table 15.

As has been discussed in an earlier chapter, marriage is preeminently a relationship between lineages, and it is now seen that the flow of land is primarily a result of interlineage marriages. In the next chapter, an analysis will be made using digraphs to demonstrate how the circulation of human resources via marriage and adoption, and land resources as a corollary of marriage relationships, combine to build the structure of solidarity and alliance on the atoll.

VI. THE STRUCTURE OF SOLIDARITY AND ALLIANCE

A. Definitions

This chapter will begin with a series of definitions necessary for an understanding of the analysis, most of which are taken from graph theory. A discussion of connectivity and density in digraphs will then be undertaken, to be followed by a look at how data on descent groups, land, marriage and adoption will be handled with digraphs. Finally, the digraphs themselves will be presented, along with a detailed analysis and comparison of the structural patterns revealed.

A digraph D is a set of n points ($n \geq 1$) and a set of m directed lines that connect at least some of these points pairwise. No two distinct lines in a digraph can be "parallel" (i.e., connect the same pair of points in the same direction), and there are no "loops" (lines connecting a point with itself). Thus a digraph is an irreflexive relation. Generally, the points in a digraph represent entities and the directed lines stand for a relationship between these entities.

A valued digraph has different values assigned to its lines to show strength, intensity, frequency or some other variable.

A marked digraph has different values assigned to the points to represent distinct entities or kinds of entities.

A primary zone is the set of all relationships between a point in D and all other points with which it is in direct relationship.[1]

A semipath is a nonredundant connecting sequence of directed lines, not necessarily unidirectional, from one point to another.

A path is a unidirectional semipath from one point to another.

A clique is a subset of two or more points in D that are all in reciprocal relationship.

A semiclique is a subset of more than two points in D, all of which are in reciprocal relationship except one pair that is not joined directly.

A block is a subset of more than two points in D that all are joined directly by at least a one-way relationship.

A semiblock is a subset of more than two points in D, all of which are joined directly by at least a one-way relationship except one pair that is not joined directly.

A transmitter is a point that has only outgoing directed lines; its outdegree is positive and its indegree is zero.

A receiver is a point that has only incoming directed lines; its indegree is positive and its outdegree is zero.

A carrier is a point that has both incoming and outgoing directed lines; its indegree and outdegree are both positive.

An isolate is a point with no incoming or outgoing directed lines; its indegree and outdegree are both zero.

A strengthening point of D is a point, removal of which decreases the strength of connectivity of D.

A weakening point of D is a point, removal of which increases the strength of connectivity of D.

A neutral point of D is a point, removal of which does not affect the strength of connectivity of D.

The innumber of a point v is the path of greatest length in D from a point u to v.

The outnumber of a point v is the path of greatest length in D from v to u.

Taken together, the innumber and outnumber of a point make up the associated number pair of a point v that are directional duals. The point in D

with the smallest finite outnumber is an outcentral point of D, and by the same token, the point in D with the smallest finite innumber is an incentral point of D.

B. Connectivity and Density in a Digraph

The concept of connectivity has been treated variously by workers in a number of disciplines who have adapted it to their own particular purposes, and this has led to a certain amount of confusion. Barnes sums up this state of affairs by observing:

> ...in five papers, derived over a period of fifteen years in sequence from one another as shown by their footnote references, the term 'connectivity' is applied to six distinct measures, each writer apparently introducing changes to suit his own convenience without reference to contemporary common usage in his own and related fields of inquiry (1969:224)

In order to avoid this pitfall, the analysis herein will adhere strictly to the widely accepted definition of connectivity of a digraph set forth in Harary, Norman and Cartwright (1965:51). There are four kinds of connectivity: strong, unilateral, weak and disconnected. These are represented symbolically as C_3, C_2, C_1 and C_0 respectively. D is strongly connected if every two points u and v are mutually reachable, i.e., if there is a path from u to v and a path from v to u. D is unilaterally connected if for any two points u and v, at least one is reachable from the other, i.e., if there is a path from u to v or a path from v to u but not both. D is weakly connected if any two points u and v are joined but not reachable, i.e., if there is a semipath from u to v or from v to u. D is disconnected if any two points u and v are not joined, i.e., if there is not even a semipath between them.

The strength of connectivity of D can be determined quickly by reference to the characteristics of its constituent points. If all points in D are carriers, D is C_3. If there is only one transmitter, only one receiver, or

only one transmitter and one receiver in D, D is C_2. In cases where there are two or more transmitters or receivers in D, D is C_1. If D contains at least one isolate, D is C_0.

Much work using graph theory and/or matrix algebra with small group data to determine and examine cliques has been reported in the literature (Luce 1950; Harary and Ross 1957; Hubbell 1965; Doreian 1969). Doreian (1970) provides a summary of the major definitions of clique that have been proposed, and he chooses the one that imposes the strictest conditions on what points form a clique: a maximal subset of points, each in a reciprocal relation with the others. In digraph terms such a clique is a complete, symmetric digraph and it is this definition of a clique that has been adopted here.

By definition, all cliques and semicliques are C_3. Similarly, by definition, all blocks and all four-point semiblocks must be either C_3 or C_2. Three-point semiblocks, by definition, must be either C_2 or C_1.

Semicliques and semiblocks permit handling of "two-step connection" in digraphs (Ross and Harary 1959). They also allow examination of subsets of elements where only one relationship is absent from what otherwise would be a clique or a block, and thus get around one major criticism against using cliques as a concept of structure (Doreian 1969). Subsets where only one relationship is missing from what would be a clique or a block are especially common in the analysis to be presented because of the restriction on alliance imposed by the rule of clan exogamy.

In a recent paper, Barnes (1968) devotes attention to a way for measuring the density of lines (relationships) in undirected graphs, and this idea is mentioned approvingly by Wolfe (1970), although he does nothing to develop it further. At first blush, it might be thought that a measure of density would provide an excellent index of the degree of connectivity that obtains in

digraphs. In the case under examination, however, the rule of clan exogamy automatically eliminates a large number of potential direct links between points (descent groups), with a result that Barnes's percentage of density measure cannot be used. For example, Wenikar clan includes fourteen lineages while Souwon and Inemarau clans have only one lineage each. Obviously, the potential number of relationships Inemarau or Souwon might establish is much greater than that for any Wenikar lineage. More telling than this is Harary, Norman and Cartwrights' observation that "...any index of the density of a digraph (i.e., one based on the number of its lines) will be a poor indicator of its connectedness properties (1965:75)."

This study seeks to demonstrate and elucidate how descent groups are joined together, within the limits of cultural rules governing how such joining may take place, into reciprocal and interdependent alliances out of which social structural solidarity results. With this in mind, a sheer measure of the density of links joining descent groups provides little information of value concerning <u>how</u> the groups are actually joined. Measures of connectivity, on the other hand, do provide such information, and it is for this reason that density of relationships is not treated in the analysis. The major part of the analysis focuses on properties of the structural components of digraphs. Interest especially is in those components of D that possess stronger connectivity than the whole.

C. Translation of Data Into Digraphs

All of the digraphs are marked digraphs in which points are assigned the value of a discrete, identifiable descent group, each with its own symbolic abbreviation. The "value" so assigned plays a role in what combinations among points are possible where marriage transactions influence the situation.

All of the digraphs depicted are valued digraphs. Lines in the digraphs

represent different strengths of alliances that are portrayed by separate kinds of lines. In the digraphs, two points are joined by a line that stands for the actual number of the five possible transactions that exist in any given case (see below for details of these transactions). These numbers are placed on a four point scale. At the top of the scale, representing the strongest possible alliance between any two points, is a five-bond line. This means that descent group A has all five of the transactions under consideration with descent group B. Other points on the scale are four-bond, three-bond and two-bond lines, that likewise show the number of transactions out of the five possible that occur between A and B. The minimum criterion for a line to occur in D is that at least two of the five transactions must be present. Hence all cases where only one of the five transactions exist drop out. The digraphs are at a second level of abstraction from the raw data and they show relationships among relationships.

For an example of how D for the primary zone of a single lineage has been constructed, take Wenikar-2b lineage. The column at left in table 16 lists each of the five transactions, and the entries to the right show with which lineages Wenikar-2b has that transaction. As the table makes clear, Wenikar-2b has all five transactions with Sör-1a and Souwon, two out of five with Sör-2a and Sör-2b, and only one with the remainder. In this case, the eight lineages with which Wenikar-2b has only one of the five transactions drop out because they do not satisfy the criterion for an alliance. Thus the primary zone D for Wenikar-2b contains Sör-1a, Sör-2a, Sör-2b and Souwon (see figure 6).

The strength of connectivity for the primary zone D surrounding each descent group will be measured, properties of points in D will be discussed, and cliques, semicliques, blocks and semiblocks will be pointed out. Following this, complete digraphs for each level of bonding will be drawn and dissected analytically into their structural components. Once all the digraphs and

TABLE 16

EXAMPLE OF HOW PRIMARY ZONE DIGRAPHS HAVE BEEN CONSTRUCTED

Transactions	Lineages				
	Sör-1a	Sör-2a	Sör-2b	Souwon	Other Lineages
1. Transmits at least three plots of land to.	X	X	X	X	
2. Receives at least three plots of land from.	X			X	Wenikar-1b
3. Men marry into twice or more.	X			X	Sör-1b; Katamak-a
4. Women marry into twice or more.	X		X	X	
5. Gives one or more child to in adoption.	X	X		X	Wenikar-1a; Wenikar-2e; Wenikar-5b; Söpwunipi-a; Fenimei-a
TOTAL	5	2	2	5	1 each

discussion have been presented, it will be possible to turn to comparisons and to reach some conclusions about the structure of solidarity and alliance on Namoluk.

With the background and definitions presented above, it is now possible to translate the raw data to be analyzed into digraphs. Coombs et al. have expressed succinctly how this process is carried out:

> With some segment of the real world as his starting point, the scientist, by means of a process we shall call abstraction..., maps his object system into one of the mathematical systems or models. By mathematical argument...certain mathematical conclusions are arrived at as necessary (logical) consequences of the postulates of the system. The mathematical conclusions are then converted into physical conclusions by a process we shall call interpretation....(1954:19).

Points in the digraphs represent descent groups (lineages, subclans, clans), and directed lines indicate a relationship (transactions) between descent groups. The following symbols are used to signify each of the descent groups to be considered:

NAMOLUK CLANS		NAMOLUK SUBCLANS		NAMOLUK LINEAGES	
Name	Symbol	Name	Symbol	Name	Symbol
1. Wenikar	W	2. Wenikar-1	W1	1. Wenikar-1a	W1a
				2. Wenikar-1b	W1b
				3. Wenikar-1c	W1c
				4. Wenikar-1d	W1d
		2. Wenikar-2	W2	5. Wenikar-2a	W2a
				6. Wenikar-2b	W2b
				7. Wenikar-2c	W2c
				8. Wenikar-2d	W2d
				9. Wenikar-2e	W2e
		3. Wenikar-3	W3	10. Wenikar-3	W3
		4. Wenikar-4	W4	11. Wenikar-4a	W4a
				12. Wenikar-4b	W4b
		5. Wenikar-5	W5	13. Wenikar-5a	W5a
				14. Wenikar-5b	W5b
2. Sör	S	6. Sör-1	S1	15. Sör-1a	S1a
				16. Sör-1b	S1b
		7. Sör-2	S2	17. Sör-2a	S2a
				18. Sör-2b	S2b
				19. Sör-2c	S2c
3. Katamak	K	8. Katamak	K	20. Katamak-a	Ka
				21. Katamak-b	Kb
				22. Katamak-c	Kc

NAMOLUK CLANS		NAMOLUK SUBCLANS		NAMOLUK LINEAGES	
Name	Symbol	Name	Symbol	Name	Symbol
				23. Katamak-d	Kd
4. Fenimei	F	9. Fenimei	F	24. Fenimei-a	Fa
				25. Fenimei-b	Fb
				26. Fenimei-c	Fc
5. Söpwunipi	SP	10. Söpwunipi	SP	27. Söpwunipi-a	SPa
				28. Söpwunipi-b	SPb
				29. Söpwunipi-c	SPc
6. Souwon	SW	11. Souwon	SW	30. Souwon	SW
7. Inemarau	IN	12. Inemarau	IN	31. Inemarau	IN

The analysis will concern all seven clans, twelve subclans, and thirty-one lineages for which genealogical materials were collected. Relations among these descent groups, with respect to the circulation of land and the circulation of people, will be investigated for the following five specific transactions:

(1) Descent group X transmits three or more taro plots or dry land parcels to descent group Y.

(2) Descent group X receives three or more taro plots or dry land parcels from descent group Y.

(3) Women of descent group X marry men of descent group Y twice or more.

(4) Men of descent group X marry women of descent group Y twice or more.

(5) Descent group X gives one or more child to descent group Y in adoption.

A number of questions must be answered at this point. Why have the particular number <u>three</u> pieces of land, <u>two</u> marriages, or <u>one</u> adoption been selected to represent "a transaction," and not some others? Why have exchange transactions involving such things as material goods, food, labor, money and political support been ignored in the analysis?

By choosing the particular numbers I have to represent a transaction in land, marriage or adoption, I have made another arbitrary decision regarding my data. In each case, the cut-off point for "a transaction" has been selected

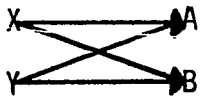
with an eye to reducing an almost overwhelming complexity to manageable proportions, without distorting the data unfairly. Exchange transactions among descent groups in resources other than people and land have been left out of consideration for two reasons. First, in the eyes of Namoluk citizens, they are epiphenomena of the more basic transactions in land and kinship. Namoluk people always explain transactions in food, labor, and so on, by reference to preexisting transactions in kinship or land. Second, my data for exchanges of food, political support, and other similar kinds of transactions among descent groups are not exhaustive, and to proceed with an analysis of incomplete data would be injudicious.

The decision was made to limit examination of land transmission to taro plots and dry land parcels for two reasons. First, these two resources are the most highly valued by Namoluk people of the kinds of land resources available. Second, in a great many cases, trees are transmitted from one person to another as payment for services, and inclusion of these data would confound rather than clarify the picture. Reef sections and fish weirs have been left out because their numbers are few and they conform in every case to patterns of transmission amply illustrated by the taro plot and dry land parcel information. A transaction may occur when a taro plot or dry land parcel is transmitted by any means listed in table 14.

Two marriages was the number selected for a minimal marriage transaction to exist. Single marriages may occur at random and do not represent an alliance, although they might represent the first step in the eventual establishment of a marriage alliance.

An adoption was considered to set up relationships among at least two and no more than four lineages in the following manner. A child born to a woman in lineage X and a man in lineage Y is given in adoption to a woman in lineage A

and a man in lineage B. This may be interpreted as a transaction between each of the four adults or their respective lineages. Each of the child's natural parents is in a relationship "gives a child in adoption" to each of the child's adoptive parents in the manner indicated below:



Thus one adoption may yield a maximum of four interlineage transactions for purposes of the analysis.[2]

D. Analysis of the Digraphs

Four connections exist among Namoluk lineages that do not represent alliances and must be explained. In all four cases, the connection is one-way only and at a two-bond level. These connections all concern lineages in the same subclan directly joined by transactions number one (transmits land to) and number five (gives a child to in adoption).

In the first case, S1a is joined to S2a. Examination of the raw data reveals that S1a has transmitted exactly three pieces of dry land to S2a, one by cash sale, one by exchange, and one in restitution for an injury. S1a people have three adoptive transactions with those in S2a. In two cases, the natural father was S1a and the adoptive father S2a.[3] In a third case, the natural mother was S1a and the adoptive mother S2a.

The second case concerns S2b joined to S1a. Here S2b has transmitted three pieces of dry land and one taro plot to S1a. Two of the dry land parcels were by cash sale, while the third parcel and the taro plot were "inherited" in the following way. S1a paid these two pieces of land to S2b as indemnity for divorce. When the S2b person later died, his stepmother (S1a) and step-siblings (S1a) <u>amurumur uon</u> 'remained on the land as next of kin', and they continue to control it. The fact that this S2b person had no living siblings,

that S2b has no surviving women, and that S2b currently has only two living male members explains why S2b made no bid to retain these lands. Only one adoptive link exists between S2b and S1a (the minimal transaction), a case in which the child's natural father was S2b and his adoptive mother was S1a.

Kb has transmitted three dry land parcels and two taro plots to Kc. All of these, except for one taro plot (a cash sale), were given to Kc as an immigrant client lineage sponsored by Kb. Only one adoptive link binds these two lineages (again, the minimal possible transaction): the natural and adoptive mothers belonged to Kb and Kc respectively.

W1c's link to W2a is a bit more complex. One dry land parcel and four taro plots have been transmitted, one of the latter by cash sale. The remainder was given in inheritance as a result of an endogamous marriage. This marriage is endogamous, however, only in accordance with the ideal rules governing Namoluk marriage (see Marshall: n.d. b). When real behavior is examined, this marriage may be explained (as it is explained by informants) as a case that is not "really" endogamous. This is because the W2a spouse was adopted by a Namoluk couple from off-island, from a clan not represented on Namoluk. As such, she became a client adoptive member of W2a on Namoluk. When she chose to marry a W1c man, therefore, the marriage was permitted because she was not "really" Wenikar, i.e., her natal clan was something else.[4] The single adoptive link (once again the minimal adoption transaction between two lineages) joining W1c and W2a is a result of the above couple adopting one of the man's lineage 'sister's' daughters from the Oneop branch of his lineage.

Thus all four of these cases result from instances where resources were being shared, in keeping with common clan or subclan membership, and not as a consequence of alliance based on exchange of resources. The only instance above where land was actually transmitted by inheritance is not viewed as an

endogamous marriage by people on the atoll. For these reasons, the four connections just discussed have been left out of the digraphs. To include them would present a false impression of alliances among Namoluk descent groups, and would unnecessarily increase the complexity of the digraphs.

The following conventions have been adopted for the digraph figures that follow. A line with no arrowheads represents a reciprocal transaction; arrowheads indicate the direction of one-way transactions or of two-way transactions of different strength. The four possible kinds of bonding in the digraphs are shown by the lines illustrated below:

(1) Five-bond relationship: 

(2) Four-bond relationship: 

(3) Three-bond relationship:

(4) Two-bond relationship:

Figure 1 is C_3. W1a is a strengthening point, and all remaining points are neutral points. The structural components of figure 1 containing W1a are listed below.

Two-Point Cliques
1. W1a-S1a
2. W1a-S2b
3. W1a-Ka
4. W1a-Kb
5. W1a-Fb
6. W1a-SW

Three-Point Cliques
1. W1a-S1a-Ka
2. W1a-S1a-Kb
3. W1a-S1a-Fb
4. W1a-SW-Fb

Three-Point Semicliques
1. W1a-S1a-SW
2. W1a-S1a-S2b
3. W1a-S2b-Ka
4. W1a-S2b-Kb
5. W1a-S2b-Fb
6. W1a-S2b-SW
7. W1a-Ka-Kb
8. W1a-Ka-Fb
9. W1a-Ka-SW
10. W1a-Kb-Fb

Four-Point Semicliques
1. W1a-S1a-Ka-Kb
2. W1a-S1a-Ka-Fb
3. W1a-S1a-Kb-Fb
4. W1a-S1a-Fb-SW

Three-Point Blocks
1. W1a-Kb-SW

Four-Point Semiblocks
1. W1a-S1a-Kb-Fb
2. W1a-S1a-Kb-SW

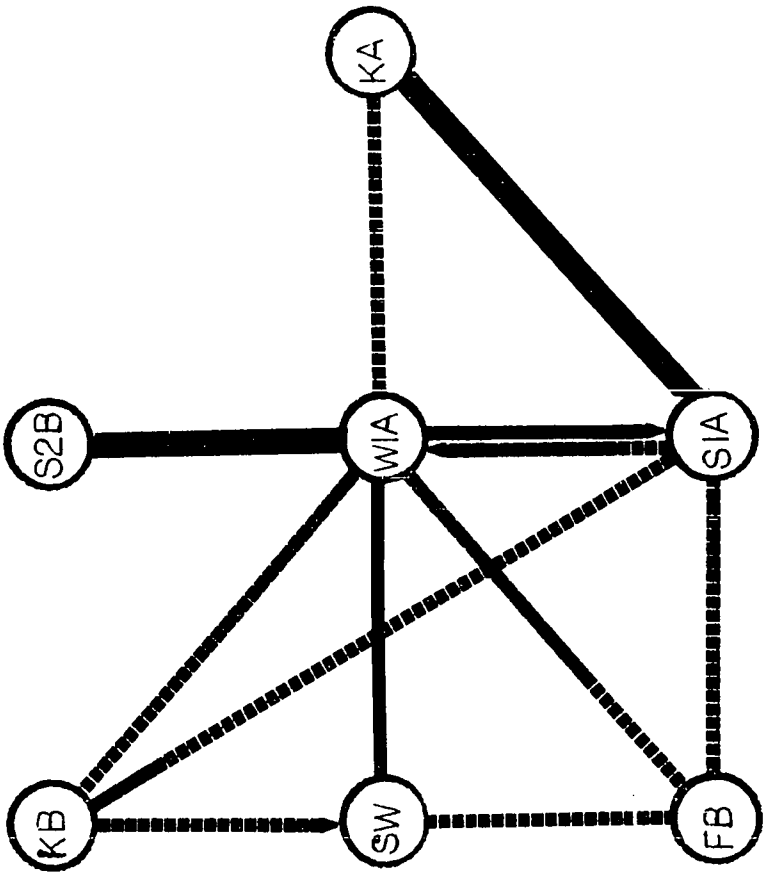


FIGURE 1 PRIMARY ZONE WIA

Figure 2 is C_1. S2a and S2b are weakening points, W1b is a strengthening point, and the remainder are neutral points. The structural components of figure 2 containing W1b are listed below.

Two-Point Cliques
1. W1b-S1a
2. W1b-S1b
3. W1b-S2c
4. W1b-Ka
5. W1b-Kb
6. W1b-SW

Three-Point Cliques
1. W1b-S1a-Ka
2. W1b-S1a-Kb
3. W1b-S1b-Ka

Three-Point Semicliques
1. W1b-S1a-S1b
2. W1b-S1a-S2c
3. W1b-S1a-SW
4. W1b-S1b-S2c
5. W1b-S1b-Kb
6. W1b-S1b-SW
7. W1b-S2c-Ka
8. W1b-S2c-Kb
9. W1b-S2c-SW
10. W1b-Ka-Kb
11. W1b-Ka-SW

Four-Point Semicliques
1. W1b-S1a-S1b-Ka
2. W1b-S1a-Ka-Kb

Three-Point Blocks
1. W1b-Kb-SW

Three-Point Semiblocks
1. W1b-S2a-S1a
2. W1b-S2a-S1b
3. W1b-S2a-S2b
4. W1b-S2a-S2c
5. W1b-S2a-Ka
6. W1b-S2a-Kb
7. W1b-S2a-SW
8. W1b-S2b-S1a
9. W1b-S2b-S1b
10. W1b-S2b-S2c
11. W1b-S2b-Ka
12. W1b-S2b-Kb
13. W1b-S2b-SW

Four-Point Semiblocks
1. W1b-S1a-Kb-SW

Figure 3 is C_3. W1c is a strengthening point, and the rest are neutral points. Listed below are the structural components of figure 3 containing W1c.

Two-Point Cliques
1. W1c-S1a
2. W1c-SW
3. W1c-IN

Three-Point Semicliques
1. W1c-S1a-SW
2. W1c-S1a-IN
3. W1c-SW-IN

Figure 4 is C_3, and all points are neutral points. W1d is contained in the following structural components in figure 4:

Two-Point Cliques
1. W1d-S1a
2. W1d-Ka

Three-Point Cliques
1. W1d-S1a-Ka

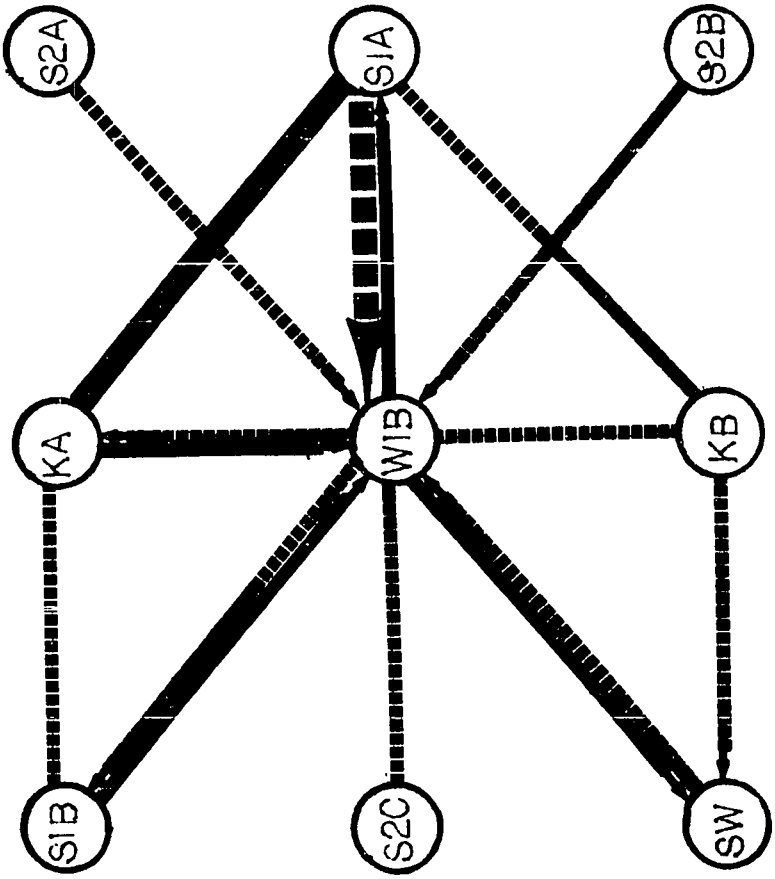


FIGURE 2 PRIMARY ZONE W1B

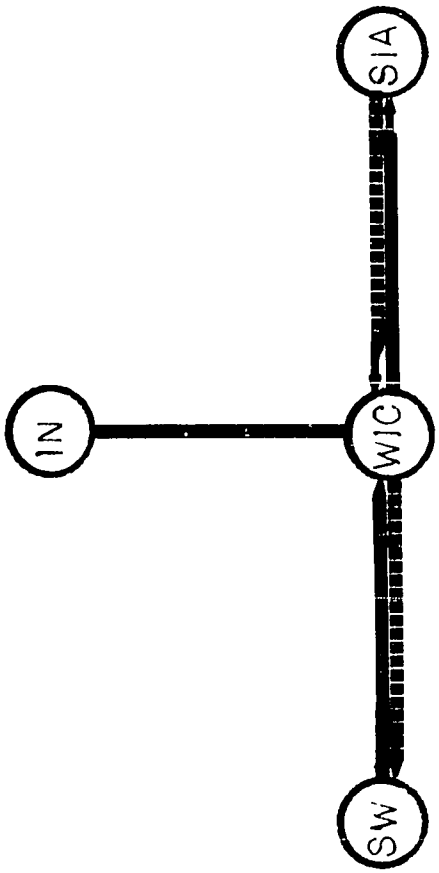


FIGURE 3 PRIMARY ZONE WIC

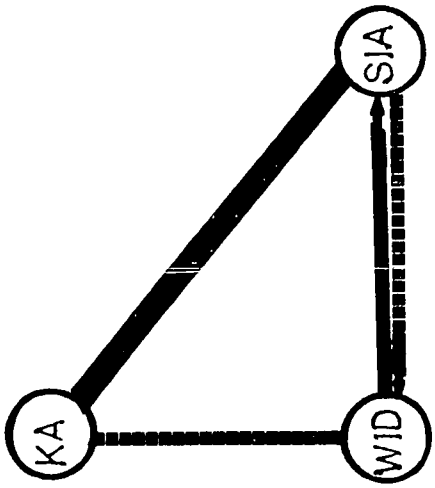


FIGURE 4 PRIMARY ZONE WID

Figure 5 is C_3. S1a, SPa, and W2a are strengthening points, with all other points neutral points. Component structures of figure 5 including W2a are:

Two-Point Cliques
1. W2a-S1a
2. W2a-S2b
3. W2a-S2c
4. W2a-Ka
5. W2a-Kd
6. W2a-SPa
7. W2a-SW

Three-Point Cliques
1. W2a-S1a-Ka

Three-Point Semicliques
1. W2a-S1a-S2b
2. W2a-S1a-S2c
3. W2a-S1a-Kd
4. W2a-S1a-SPa
5. W2a-S1a-SW
6. W2a-S2b-S2c
7. W2a-S2b-Ka
8. W2a-S2b-Kd
9. W2a-S2b-SPa
10. W2a-S2b-SW
11. W2a-S2c-Ka
12. W2a-S2c-Kd
13. W2a-S2c-SPa
14. W2a-S2c-SW
15. W2a-Ka-Kd
16. W2a-Ka-SPa
17. W2a-Ka-SW
18. W2a-Kd-SPa
19. W2a-Kd-SW
20. W2a-SPa-SW

Three-Point Blocks
1. W2a-S1a-Kb
2. W2a-S2a-SPa
3. W2a-Kb-SW

Three-Point Semiblocks
1. W2a-S2a-S1a
2. W2a-S2a-S2b
3. W2a-S2a-S2c
4. W2a-S2a-Ka
5. W2a-S2a-Kb
6. W2a-S2a-Kd
7. W2a-S2a-SW
8. W2a-S2b-Kb
9. W2a-S2c-Kb
10. W2a-Ka-Kb
11. W2a-Kd-Kb
12. W2a-SPa-Kb

Four-Point Semiblocks
1. W2a-S1a-Ka-Kb
2. W2a-S1a-Kb-SW

Figure 6 is C_2, and its weakening point is S2a. W2b is a strengthening point and the other points are neutral. The components of figure 6 of which W2b is a part include:

Two-Point Cliques
1. W2b-S1a
2. W2b-S2b
3. W2b-SW

Three-Point Semicliques
1. W2b-S1a-SW
2. W2b-S1a-S2b
3. W2b-S2b-SW

Three-Point Semiblocks
1. W2b-S2a-S1a
2. W2b-S2a-S2b
3. W2b-S2a-SW

Figure 7 is C_2, with S2a its weakening point. W2c is a strengthening point, and S1b and S2b are neutral points. The structural components of the primary zone of W2c are:

Two-Point Cliques
1. W2c-S1b
2. W2c-S2b

Three-Point Semicliques
1. W2c-S1b-S2b

Three-Point Semiblocks
1. W2c-S2a-S1b
2. W2c-S2a-S2b

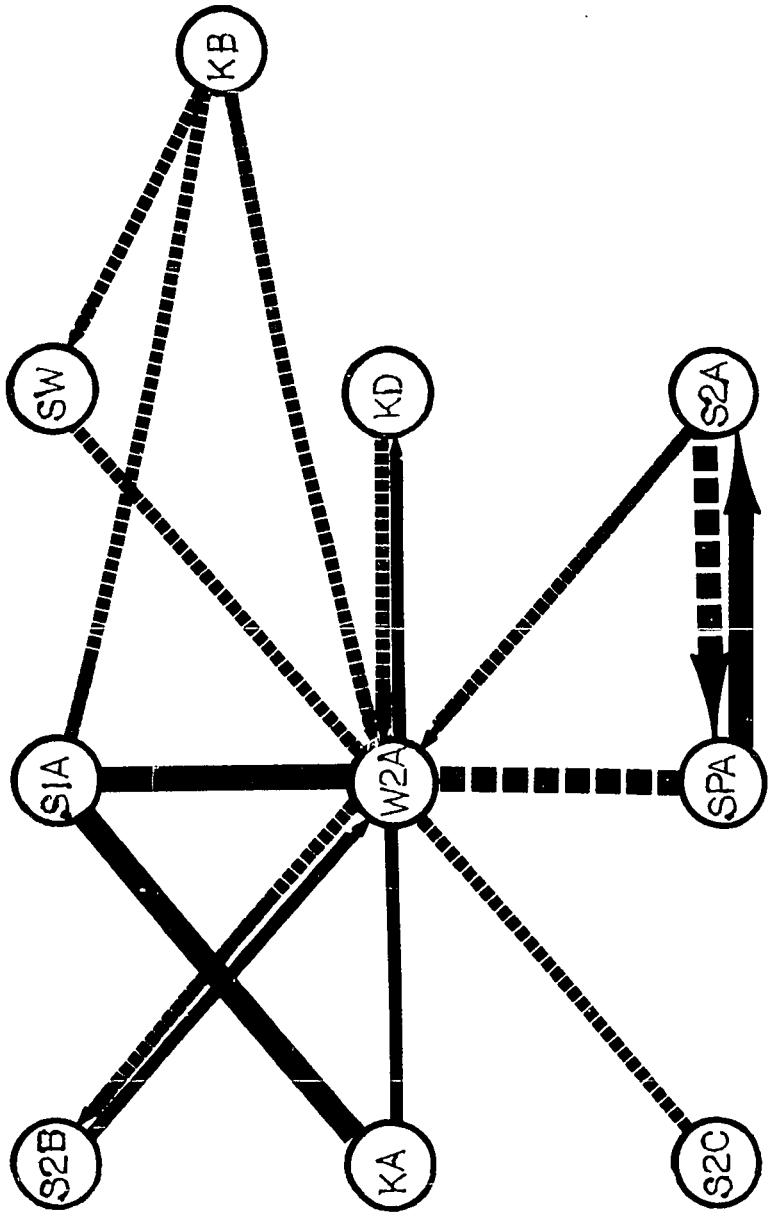


FIGURE 5 PRIMARY ZONE W2A

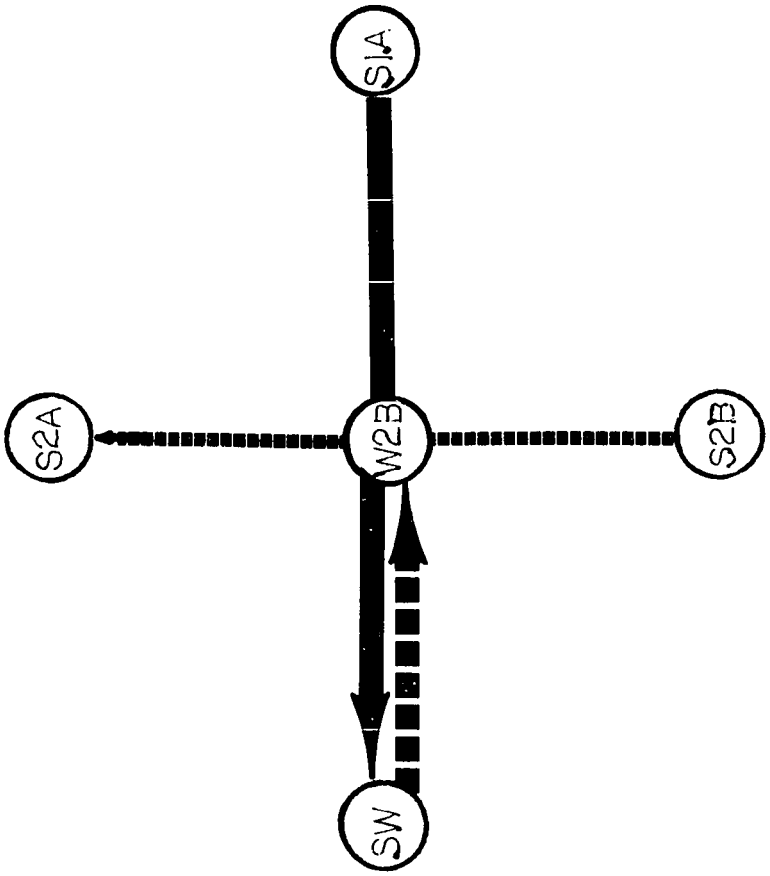


FIGURE 6 PRIMARY ZONE W2B

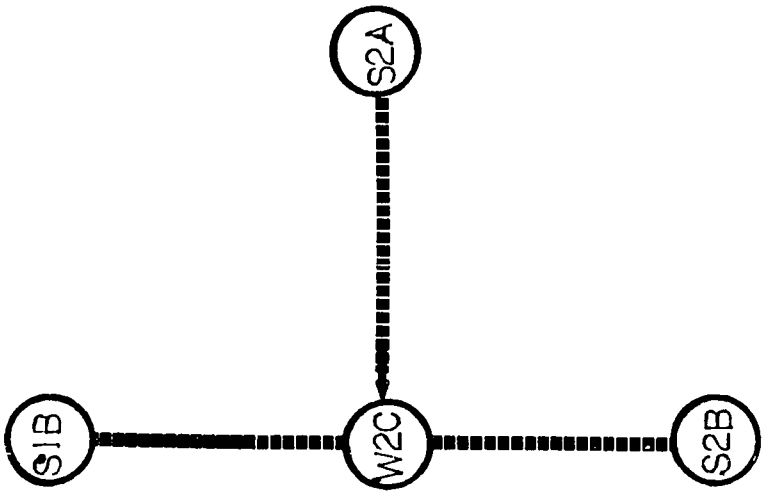


FIGURE 7 PRIMARY ZONE W2C

Figure 8 is C_2, with W2d a strengthening point, SW a weakening point, and S1a and S2a neutral points. The list below covers the structural components of figure 8.

Two-Point Cliques
1. W2d-S1a
2. W2d-S2a

Three-Point Semicliques
1. W2d-S1a-S2a

Three-Point Semiblocks
1. W2d-SW-S1a
2. W2d-SW-S2a

Figure 9 is C_3, with W2e a strengthening point, and S1a and S1b neutral points. The structural components of this digraph are:

Two-Point Cliques
1. W2e-S1a
2. W2e-S1b

Three-Point Semicliques
1. W2e-S1a-S1b

Figure 10 is C_3. W3 is a strengthening point, with the remainder being neutral points. The components of the primary zone of W3 include:

Two-Point Cliques
1. W3-S1a
2. W3-S2a
3. W3-S2b
4. W3-Ka
5. W3-Kb
6. W3-Kc
7. W3-Fa
8. W3-Fb
9. W3-SPb
10. W3-SW

Three-Point Cliques
1. W3-S1a-Ka
2. W3-S1a-Kb
3. W3-S1a-Kc
4. W3-S1a-Fa
5. W3-S1a-Fb
6. W3-S2a-Fa
7. W3-S2b-Fa
8. W3-SW-Fa
9. W3-SW-Fb

Four-Point Semicliques
1. W3-S1a-Ka-Kb
2. W3-S1a-Ka-Kc
3. W3-S1a-Ka-Fa
4. W3-S1a-Ka-Fb
5. W3-S1a-Kb-Kc
6. W3-S1a-Kb-Fa
7. W3-S1a-Kb-Fb
8. W3-S1a-Kc-Fa
9. W3-S1a-Kc-Fb
10. W3-S1a-Fa-S2a
11. W3-S1a-Fa-S2b
12. W3-S1a-Fa-Fb
13. W3-S1a-Fa-SW
14. W3-S1a-Fb-SW

Three-Point Blocks
1. W3-Kb-SW

Four-Point Semiblocks
1. W3-S1a-Kb-SW

Three-Point Semicliques
1. W3-S1a-S2a
2. W3-S1a-S2b
3. W3-S1a-SPb
4. W3-S1a-SW
5. W3-S2a-S2b
6. W3-S2a-Ka
7. W3-S2a-Kb
8. W3-S2a-Kc
9. W3-S2a-Fb
10. W3-S2a-SPb
11. W3-S2a-SW
12. W3-S2b-Ka
13. W3-S2b-Kb
14. W3-S2b-Kc
15. W3-S2b-Fb
16. W3-S2b-SPb
17. W3-S2b-SW
18. W3-Ka-Kb
19. W3-Ka-Kc
20. W3-Ka-Fa
21. W3-Ka-Fb
22. W3-Ka-SPb
23. W3-Ka-SW
24. W3-Kb-Kc
25. W3-Kb-Fa
26. W3-Kb-Fb
27. W3-Kb-SPb
28. W3-Kc-Fa
29. W3-Kc-Fb
30. W3-Kc-SPb
31. W3-Kc-SW
32. W3-Fa-Fb
33. W3-Fa-SPb
34. W3-Fb-SPb
35. W3-SPb-SW

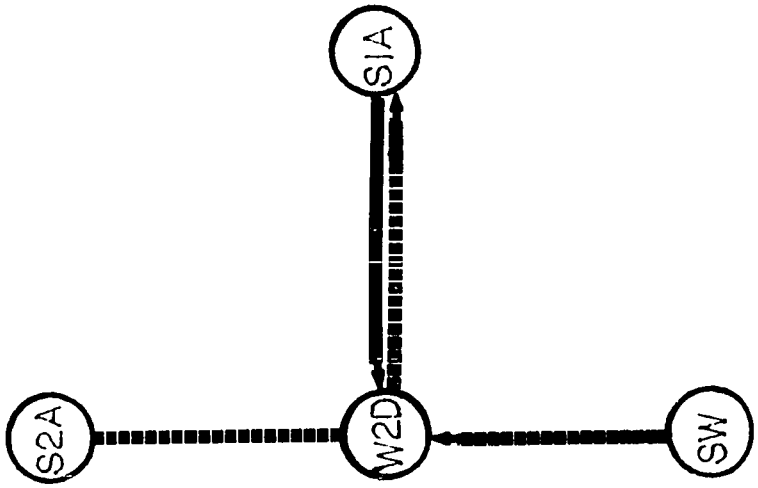


FIGURE 8 PRIMARY ZONE W2D

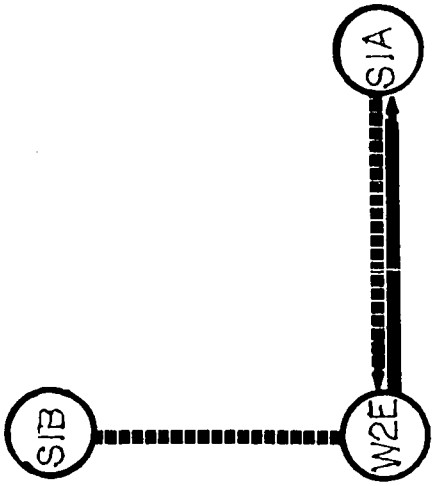


FIGURE 9 PRIMARY ZONE W2E

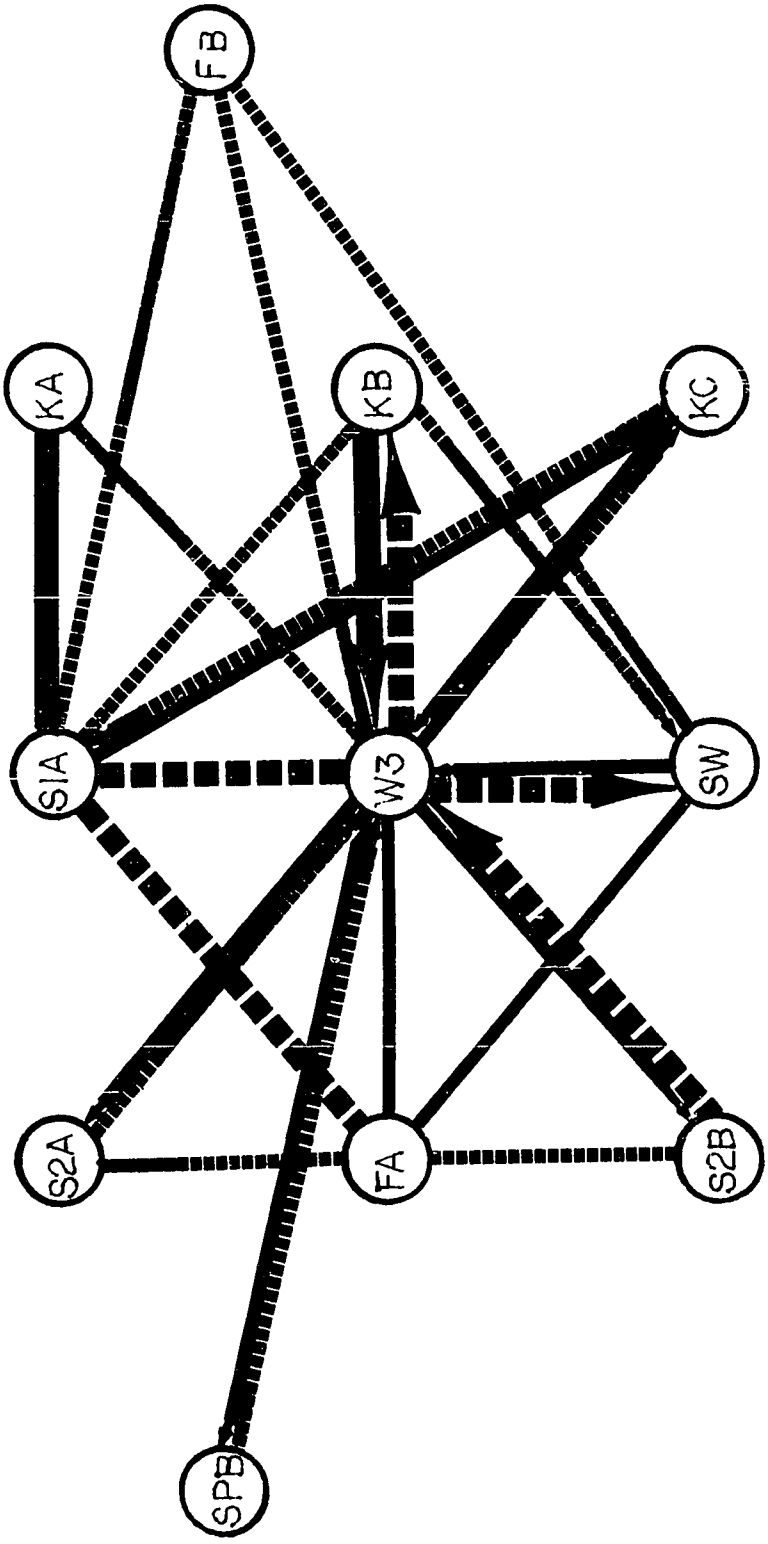


FIGURE 10 PRIMARY ZONE W3

Figure 11 is C_2, with S2b the weakening point. W4a is the strengthening point, with all others neutral points. The list below enumerates the structural components of figure 11.

Two-Point Cliques
1. W4a-S1a
2. W4a-S1b
3. W4a-S2a
4. W4a-Kb
5. W4a-Kc
6. W4a-Kd
7. W4a-SPa

Three-Point Cliques
1. W4a-S1a-Kb
2. W4a-S1a-Kc
3. W4a-S2a-SPa

Three-Point Semicliques
1. W4a-S1a-S1b
2. W4a-S1a-S2a
3. W4a-S1a-Kd
4. W4a-S1a-SPa
5. W4a-S1b-S2a
6. W4a-S1b-Kb
7. W4a-S1b-Kc
8. W4a-S1b-Kd
9. W4a-S1b-SPa
10. W4a-S2a-Kb
11. W4a-S2a-Kc
12. W4a-S2a-Kd
13. W4a-Kb-Kc
14. W4a-Kb-Kd
15. W4a-Kb-SPa
16. W4a-Kc-Kd
17. W4a-Kc-SPa
18. W4a-Kd-SPa

Three-Point Semiblocks
1. W4a-S2b-S1a
2. W4a-S2b-S1b
3. W4a-S2b-S2a
4. W4a-S2b-Kb
5. W4a-S2b-Kc
6. W4a-S2b-Kd
7. W4a-S2b-SPa

Four-Point Semicliques
1. W4a-S1a-Kb-Kc

Figure 12 is C_2, with both points strengthening points. This figure contains no structural components.

Figure 13 is C_1, with W5a a strengthening point, Kd and SW weakening points and S1a and S2a neutral points. Components of this digraph follow.

Two-Point Cliques
1. W5a-S1a
2. W5a-S2a

Three-Point Semicliques
1. W5a-S1a-S2a

Three-Point Semiblock
1. W5a-S1a-SW
2. W5a-S1a-Kd
3. W5a-S2a-SW
4. W5a-S2a-Kd

Figure 14 is C_3, with all points neutral except W5b, which is a strengthening point. The list below covers the structural components of this digraph.

Two-Point Cliques
1. W5b-S1a
2. W5b-S2b
3. W5b-Ka
4. W5b-SW

Three-Point Cliques
1. W5b-S1a-Ka

Three-Point Semicliques
1. W5b-S1a-S2b
2. W5b-S1a-SW
3. W5b-S2b-Ka
4. W5b-S2b-SW
5. W5b-Ka-SW

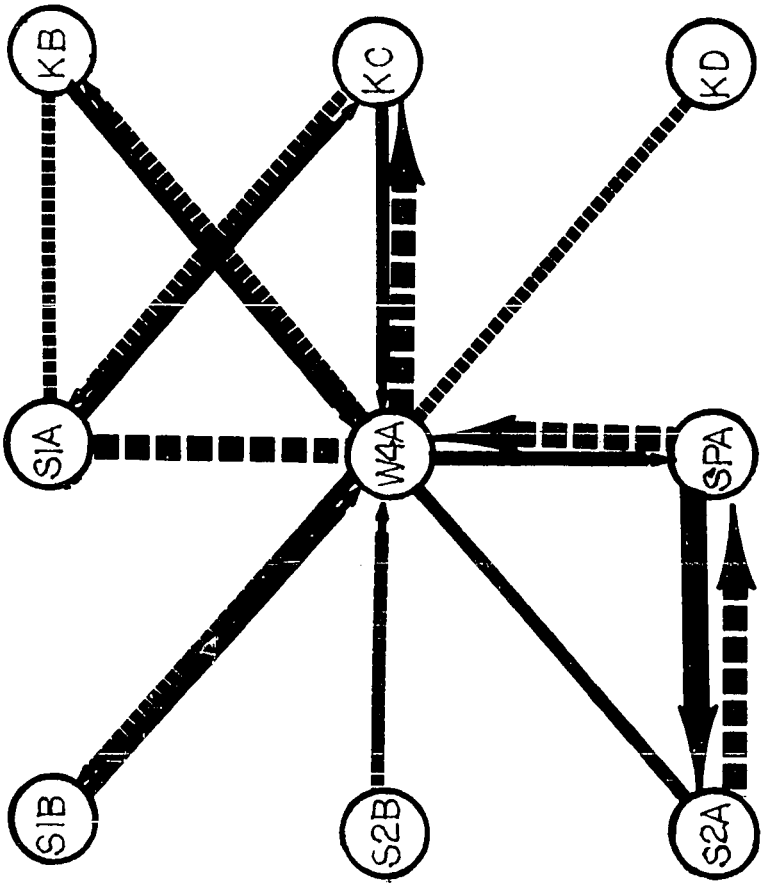


FIGURE 11 PRIMARY ZONE W4A

FIGURE 12 PRIMARY ZONE W4B

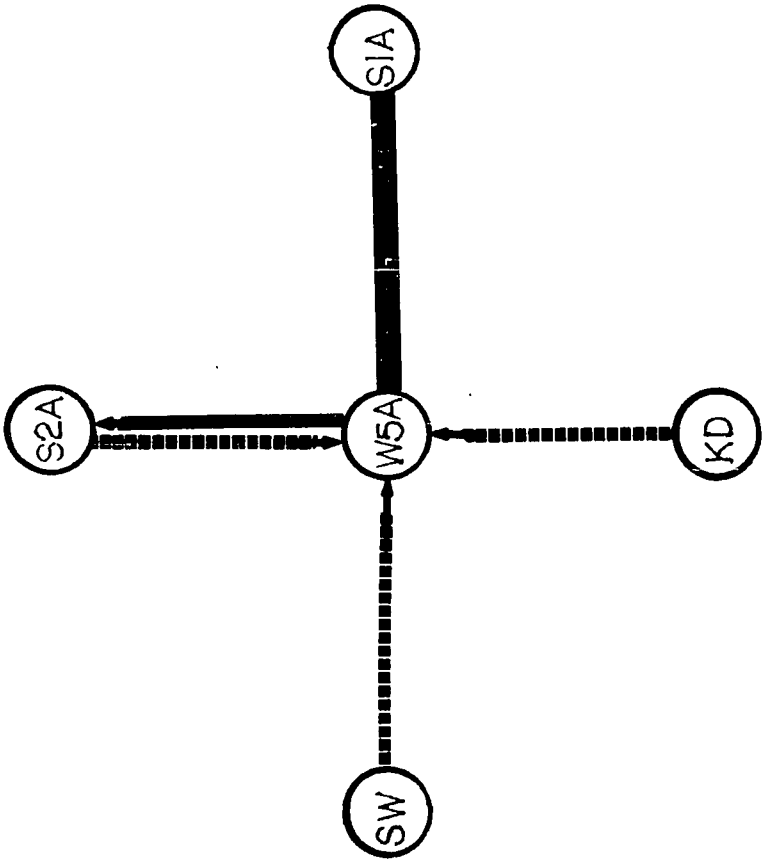


FIGURE 13 PRIMARY ZONE W5A

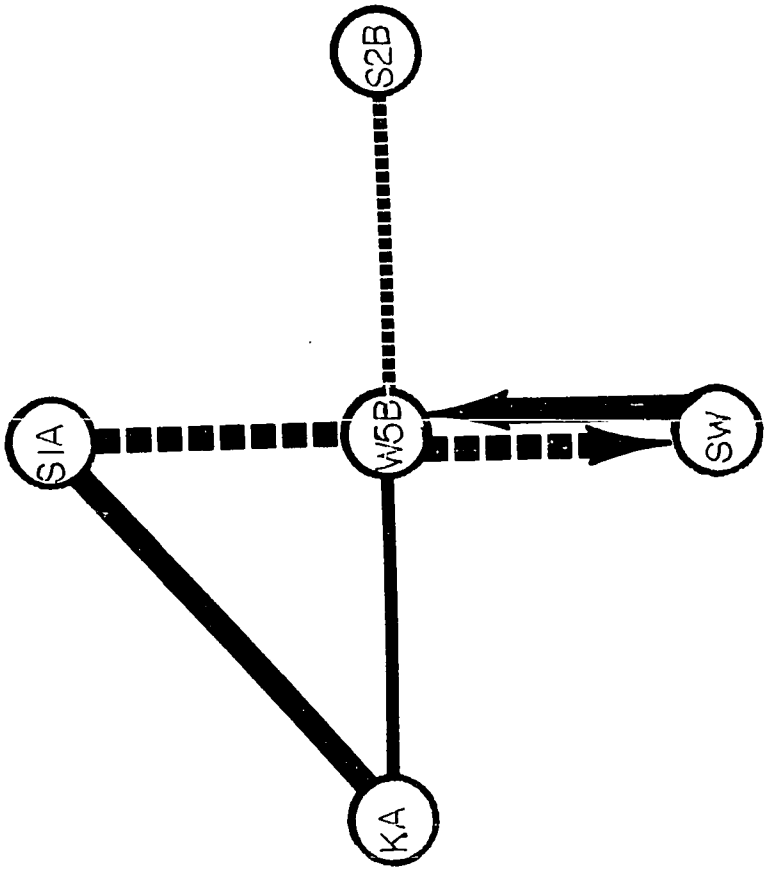


FIGURE 14 PRIMARY ZONE W5B

Figure 15 is C_3. S1a is the strengthening point, and all other points are neutral points. The collection of structural components of figure 15 of which S1a is a part is arrayed below.

Two-Point Cliques
1. S1a-W1a
2. S1a-W1b
3. S1a-W1c
4. S1a-W1d
5. S1a-W2a
6. S1a-W2b
7. S1a-W2d
8. S1a-W2e
9. S1a-W3
10. S1a-W4a
11. S1a-W5a
12. S1a-W5b
13. S1a-Ka
14. S1a-Kb
15. S1a-Kc
16. S1a-Fa
17. S1a-Fb
18. S1a-Fc
19. S1a-SPc

Three-Point Cliques
1. S1a-W1a-Ka
2. S1a-W1a-Kb
3. S1a-W1a-Fb
4. S1a-W1b-Ka
5. S1a-W1b-Kb
6. S1a-W1d-Ka
7. S1a-W2a-Ka
8. S1a-W3-Ka
9. S1a-W3-Kb
10. S1a-W3-Kc
11. S1a-W3-Fa
12. S1a-W3-Fb
13. S1a-W4a-Kb
14. S1a-W4a-Kc
15. S1a-W5b-Ka

Three-Point Blocks
1. S1a-W2a-Kb

Four-Point Semiblocks
1. S1a-W1a-Kb-W2a
2. S1a-W1b-Kb-W2a
3. S1a-W2a-Kb-W3
4. S1a-W2a-Kb-W4a
5. S1a-W2a-Kb-Kc

Three-Point Semicliques
1. S1a-W1a-W1b
2. S1a-W1a-W1c
3. S1a-W1a-W1d
4. S1a-W1a-W2a
5. S1a-W1a-W2b
6. S1a-W1a-W2d
7. S1a-W1a-W2e
8. S1a-W1a-W3
9. S1a-W1a-W4a
10. S1a-W1a-W5a
11. S1a-W1a-W5b
12. S1a-W1a-Kc
13. S1a-W1a-Fa
14. S1a-W1a-Fc
15. S1a-W1a-SPc
16. S1a-W1b-W1c
17. S1a-W1b-W1d
18. S1a-W1b-W2a
19. S1a-W1b-W2b
20. S1a-W1b-W2d
21. S1a-W1b-W2e
22. S1a-W1b-W3
23. S1a-W1b-W4a
24. S1a-W1b-W5a
25. S1a-W1b-W5b
26. S1a-W1b-Kc
27. S1a-W1b-Fa
28. S1a-W1b-Fb
29. S1a-W1b-Fc
30. S1a-W1b-SPc
31. S1a-W1c-W1d
32. S1a-W1c-W2a
33. S1a-W1c-W2b
34. S1a-W1c-W2d
35. S1a-W1c-W2e
36. S1a-W1c-W3
37. S1a-W1c-W4a
38. S1a-W1c-W5a
39. S1a-W1c-W5b
40. S1a-W1c-Ka
41. S1a-W1c-Kb
42. S1a-W1c-Kc
43. S1a-W1c-Fa
44. S1a-W1c-Fb
45. S1a-W1c-Fc
46. S1a-W1c-SPc
47. S1a-W1d-W2a
48. S1a-W1d-W2b
49. S1a-W1d-W2d
50. S1a-W1d-W2e

Four-Point Semicliques
1. S1a-W1a-Ka-W1b
2. S1a-W1a-Ka-W1d
3. S1a-W1a-Ka-W2a
4. S1a-W1a-Ka-W3
5. S1a-W1a-Ka-W5b
6. S1a-W1a-Ka-Kb
7. S1a-W1a-Ka-Fb
8. S1a-W1a-Kb-W1b
9. S1a-W1a-Kb-W3
10. S1a-W1a-Kb-W4a
11. S1a-W1a-Kb-Fb
12. S1a-W1a-Fb-W3
13. S1a-W1b-Ka-W1d
14. S1a-W1b-Ka-W2a
15. S1a-W1b-Ka-W3
16. S1a-W1b-Ka-W5b
17. S1a-W1b-Ka-Kb
18. S1a-W1b-Kb-W3
19. S1a-W1b-Kb-W4a
20. S1a-W1d-Ka-W2a
21. S1a-W1d-Ka-W3
22. S1a-W1d-Ka-W5b
23. S1a-W2a-Ka-W3
24. S1a-W2a-Ka-W5b
25. S1a-W3-Ka-W5b
26. S1a-W3-Ka-Kb
27. S1a-W3-Ka-Kc
28. S1a-W3-Ka-Fa
29. S1a-W3-Ka-Fb
30. S1a-W3-Kb-W4a
31. S1a-W3-Kb-Kc
32. S1a-W3-Kb-Fa
33. S1a-W3-Kb-Fb
34. S1a-W3-Kc-W4a

Three-Point Semicliques (continued)

51. S1a-W1d-W3
52. S1a-W1d-W4a
53. S1a-W1d-W5a
54. S1a-W1d-W5b
55. S1a-W1d-Kb
56. S1a-W1d-Kc
57. S1a-W1d-Fa
58. S1a-W1d-Fb
59. S1a-W1d-Fc
60. S1a-W1d-SPc
61. S1a-W2a-W2b
62. S1a-W2a-W2d
63. S1a-W2a-W2e
64. S1a-W2a-W3
65. S1a-W2a-W4a
66. S1a-W2a-W5a
67. S1a-W2a-W5b
68. S1a-W2a-Kc
69. S1a-W2a-Fa
70. S1a-W2a-Fb
71. S1a-W2a-Fc
72. S1a-W2a-SPc
73. S1a-W2b-W2d
74. S1a-W2b-W2e
75. S1a-W2b-W3
76. S1a-W2b-W4a
77. S1a-W2b-W5a
78. S1a-W2b-W5b
79. S1a-W2b-Ka
80. S1a-W2b-Kb
81. S1a-W2b-Kc
82. S1a-W2b-Fa
83. S1a-W2b-Fb
84. S1a-W2b-Fc
85. S1a-W2b-SPc
86. S1a-W2d-W2e
87. S1a-W2d-W3
88. S1a-W2d-W4a
89. S1a-W2d-W5a
90. S1a-W2d-W5b
91. S1a-W2d-Ka
92. S1a-W2d-Kb
93. S1a-W2d-Kc
94. S1a-W2d-Fa
95. S1a-W2d-Fb
96. S1a-W2d-Fc
97. S1a-W2d-SPc
98. S1a-W2e-W3
99. S1a-W2e-W4a
100. S1a-W2e-W5a
101. S1a-W2e-W5b
102. S1a-W2e-Ka
103. S1a-W2e-Kb
104. S1a-W2e-Kc
105. S1a-W2e-Fa
106. S1a-W2e-Fb
107. S1a-W2e-Fc
108. S1a-W2e-SPc
109. S1a-W3-W4a
110. S1a-W3-W5a
111. S1a-W3-W5b
112. S1a-W3-Fc
113. S1a-W3-SPc
114. S1a-W4a-W5a
115. S1a-W4a-W5b
116. S1a-W4a-Ka
117. S1a-W4a-Fa
118. S1a-W4a-Fb
119. S1a-W4a-Fc
120. S1a-W4a-SPc
121. S1a-W5a-W5b
122. S1a-W5a-Ka
123. S1a-W5a-Kb
124. S1a-W5a-Kc
125. S1a-W5a-Fa
126. S1a-W5a-Fb
127. S1a-W5a-Fc
128. S1a-W5a-SPc
129. S1a-W5b-Kb
130. S1a-W5b-Kc
131. S1a-W5b-Fa
132. S1a-W5b-Fb
133. S1a-W5b-Fc
134. S1a-W5b-SPc
135. S1a-Ka-Kb
136. S1a-Ka-Kc
137. S1a-Ka-Fa
138. S1a-Ka-Fb
139. S1a-Ka-Fc
140. S1a-Ka-SPc
141. S1a-Kb-Kc
142. S1a-Kb-Fa
143. S1a-Kb-Fb
144. S1a-Kb-Fc
145. S1a-Kb-SPc
146. S1a-Kc-Fa
147. S1a-Kc-Fb
148. S1a-Kc-Fc
149. S1a-Kc-SPc
150. S1a-Fa-Fb
151. S1a-Fa-Fc
152. S1a-Fa-SPc
153. S1a-Fb-Fc
154. S1a-Fb-SPc
155. S1a-Fc-SPc

Four-Point Semicliques (continued)

35. S1a-W3-Kc-Fa
36. S1a-W3-Kc-Fb
37. S1a-W3-Fa-Fb
38. S1a-W4a-Kb-Kc

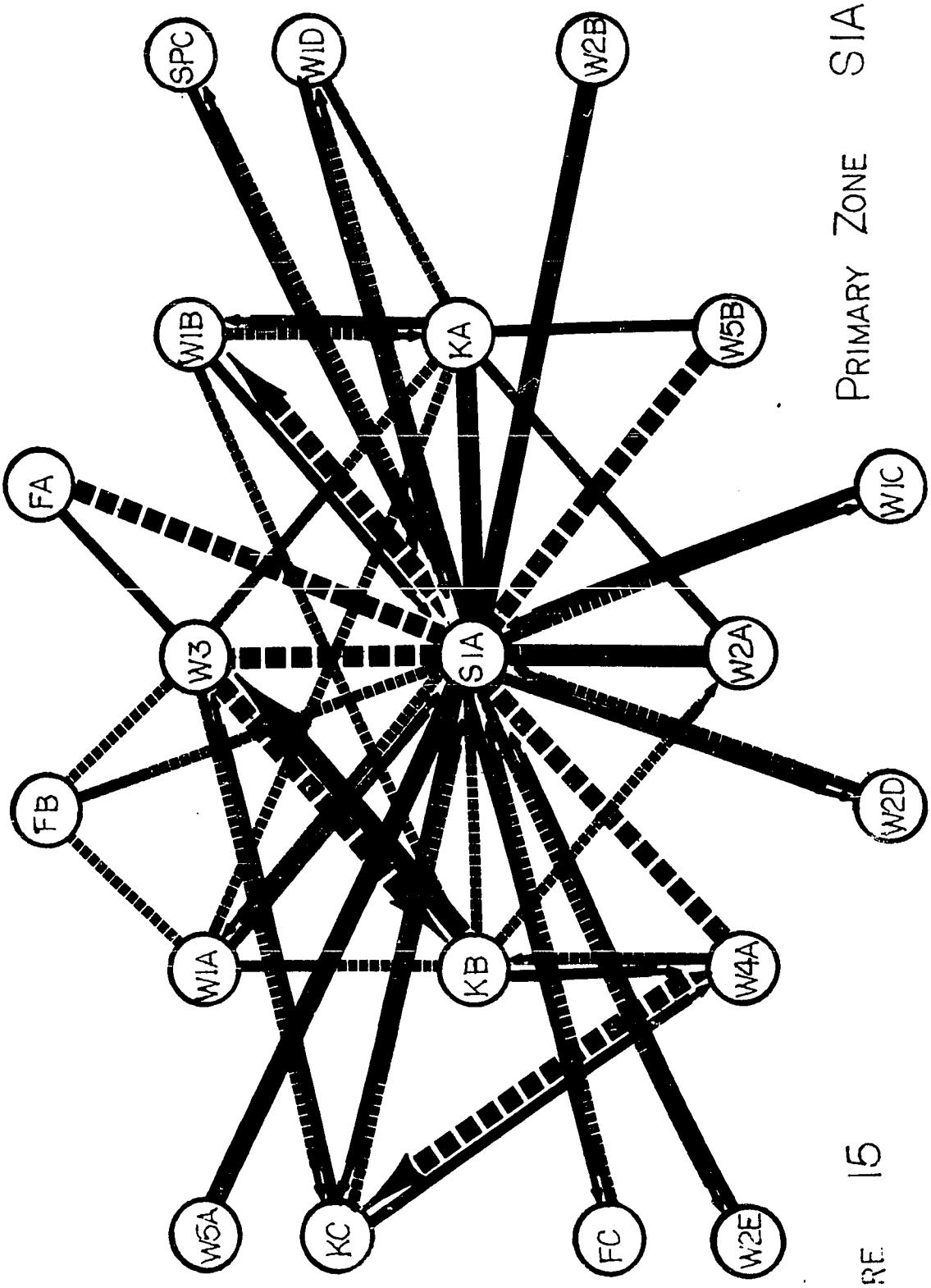


FIGURE 15 PRIMARY ZONE S1A

Figure 16 is C_3. All points are neutral points except S1b, which is a strengthening point. This digraph consists of the following components:

Two-Point Cliques
1. S1b-W1b
2. S1b-W2c
3. S1b-W2e
4. S1b-W4a
5. S1b-Ka

Three-Point Cliques
1. S1b-W1b-Ka

Three-Point Semicliques
1. S1b-W1b-W2c
2. S1b-W1b-W2e
3. S1b-W1b-W4a
4. S1b-W2c-W2e
5. S1b-W2c-W4a
6. S1b-W2c-Ka
7. S1b-W2e-W4a
8. S1b-W2e-Ka
9. S1b-W4a-Ka

Figure 17 is C_1, with S2a a strengthening point. All other points are neutral points. Figure 17 contains the following components of which S2a is a member:

Two-Point Cliques
1. S2a-W2d
2. S2a-W3
3. S2a-W4a
4. S2a-W5a
5. S2a-Fa
6. S2a-SPa

Four-Point Semiblocks
1. S2a-W2a-SPa-W4a

Three-Point Cliques
1. S2a-W3-Fa
2. S2a-W4a-SPa

Three-Point Blocks
1. S2a-W2a-SPa

Three-Point Semicliques
1. S2a-W2d-W3
2. S2a-W2d-W4a
3. S2a-W2d-W5a
4. S2a-W2d-Fa
5. S2a-W2d-SPa
6. S2a-W3-W4a
7. S2a-W3-W5a
8. S2a-W3-SPa
9. S2a-W4a-W5a
10. S2a-W4a-Fa
11. S2a-W5a-Fa
12. S2a-W5a-SPa
13. S2a-Fa-SPa

Three-Point-Semiblocks
1. S2a-W1b-W2a
2. S2a-W1b-W2b
3. S2a-W1b-W2c
4. S2a-W1b-W2d
5. S2a-W1b-W3
6. S2a-W1b-W4a
7. S2a-W1b-W5a
8. S2a-W1b-Fa
9. S2a-W1b-Fc
10. S2a-W1b-SPa
11. S2a-W2a-W2b
12. S2a-W2a-W2c
13. S2a-W2a-W2d
14. S2a-W2a-W3
15. S2a-W2a-W4a
16. S2a-W2a-W5a
17. S2a-W2a-Fa
18. S2a-W2a-Fc
19. S2a-W2b-W2c
20. S2a-W2b-W2d
21. S2a-W2b-W3
22. S2a-W2b-W4a
23. S2a-W2b-W5a
24. S2a-W2b-Fa
25. S2a-W2b-Fc
26. S2a-W2b-SPa
27. S2a-W2c-W2d
28. S2a-W2c-W3
29. S2a-W2c-W4a
30. S2a-W2c-W5a
31. S2a-W2c-Fa
32. S2a-W2c-Fc
33. S2a-W2c-SPa
34. S2a-W2d-Fc
35. S2a-W3-Fc
36. S2a-W4a-Fc

Three-Point Semiblocks (continued)
37. S2a-W5a-Fc
38. S2a-Fa-Fc
39. S2a-SPa-Fc

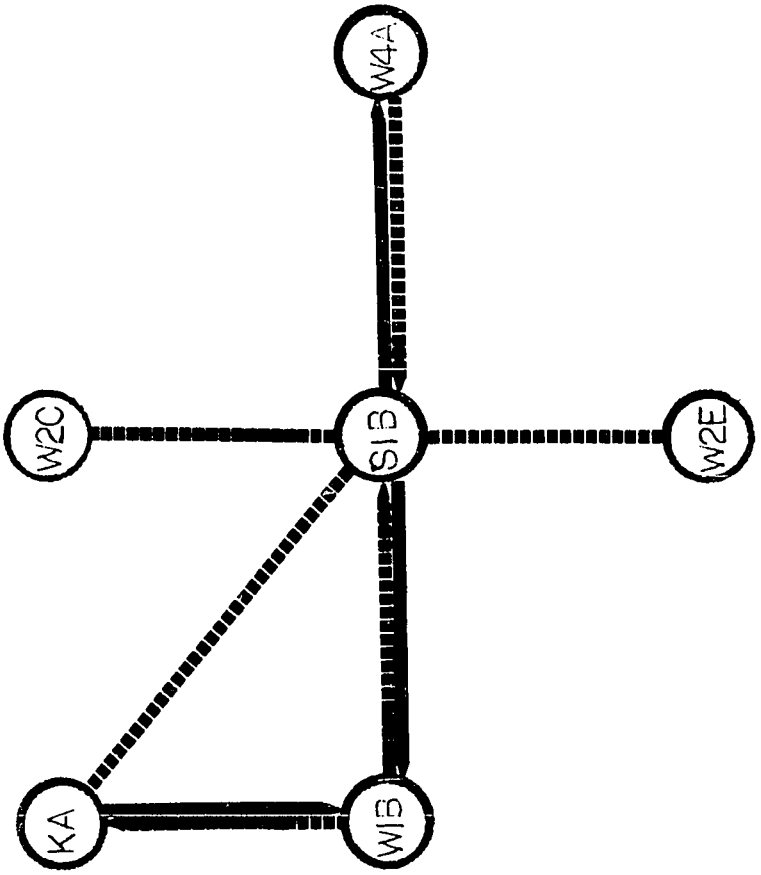


FIGURE 16 PRIMARY ZONE S1B

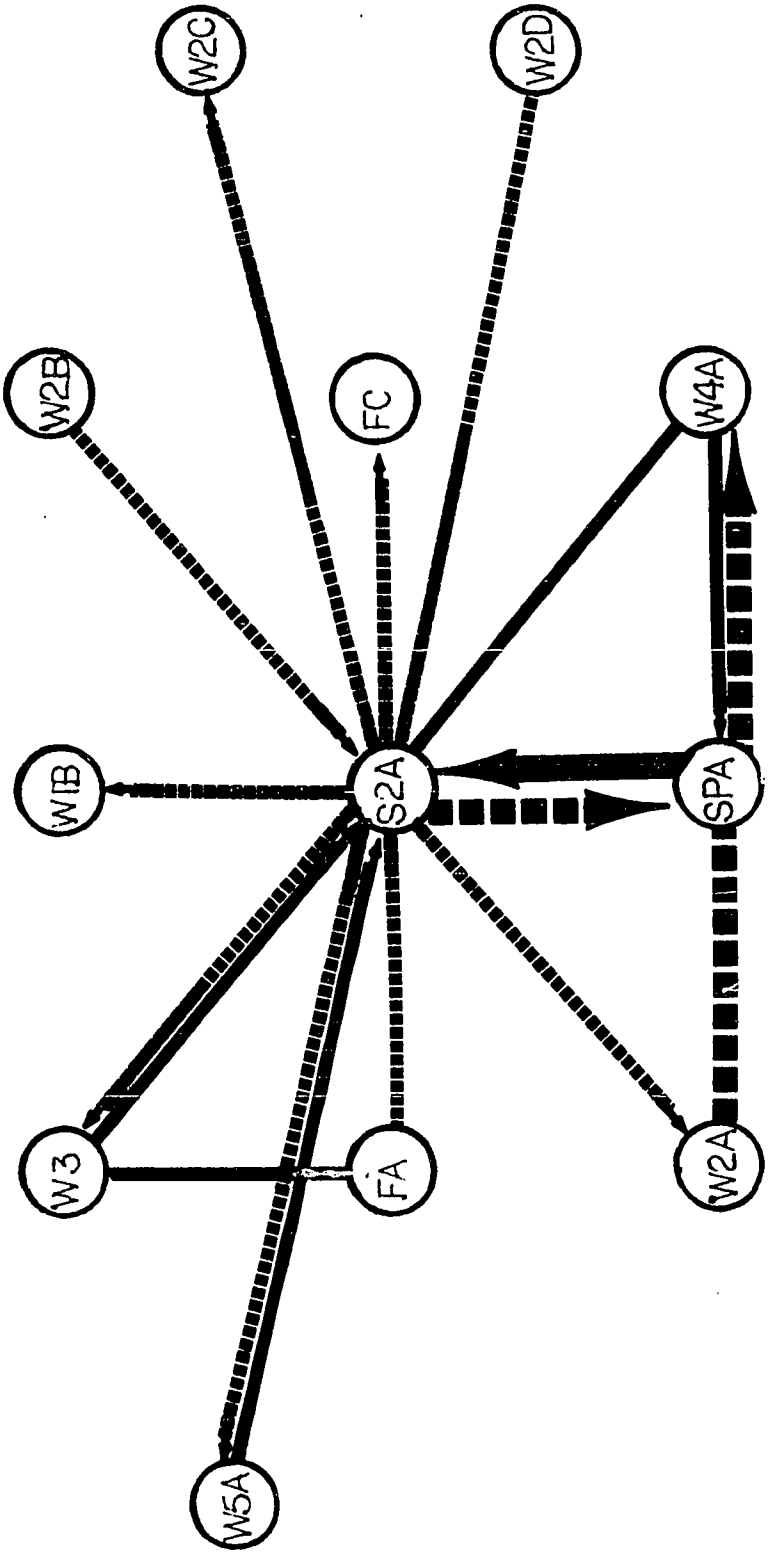


FIGURE 17 PRIMARY ZONE S2A

Figure 18 is C_1, with S2b its strengthening point, W1b and W4a its weakening points, and the remainder neutral points. Below is a list of the structural components of figure 18.

Two-Point Cliques
1. S2b-W1a
2. S2b-W2a
3. S2b-W2b
4. S2b-W2c
5. S2b-W3
6. S2b-W5b
7. S2b-Fa

Three-Point Cliques
1. S2b-W3-Fa

Three-Point Semiblocks
1. S2b-W1a-W1b
2. S2b-W1a-W4a
3. S2b-W2a-W1b
4. S2b-W2a-W4a
5. S2b-W2b-W1b
6. S2b-W2b-W4a
7. S2b-W2c-W1b
8. S2b-W2c-W4a
9. S2b-W3-W1b
10. S2b-W3-W4a
11. S2b-W5b-W1b
12. S2b-W5b-W4a
13. S2b-Fa-W1b
14. S2b-Fa-W4a

Three-Point Semicliques
1. S2b-W1a-W2a
2. S2b-W1a-W2b
3. S2b-W1a-W2c
4. S2b-W1a-W3
5. S2b-W1a-W5b
6. S2b-W1a-Fa
7. S2b-W2a-W2b
8. S2b-W2a-W2c
9. S2b-W2a-W3
10. S2b-W2a-W5b
11. S2b-W2b-Fa
12. S2b-W2b-W2c
13. S2b-W2b-W3
14. S2b-W2b-W5b
15. S2b-W2b-Fa
16. S2b-W2c-W3
17. S2b-W2c-W5b
18. S2b-W2c-Fa
19. S2b-W3-W5b
20. S2b-W5b-Fa

Figure 19 is C_2. SPb is the weakening point, and S2c the strengthening point. W1b, W2a and Fb are neutral points. The primary zone of S2c contains these components:

Two-Point Cliques
1. S2c-W1b
2. S2c-W2a
3. S2c-Fb

Three-Point Semicliques
1. S2c-W1b-W2a
2. S2c-W1b-Fb
3. S2c-W2a-Fb

Three-Point Semiblocks
1. S2c-W1b-SPb
2. S2c-W2a-SPb
3. S2c-Fb-SPb

Figure 20 is C_3, with all points neutral. Ka is involved in the following structural components of figure 20:

Two-Point Cliques
1. Ka-W1a
2. Ka-W1b
3. Ka-W1d
4. Ka-W2a
5. Ka-W3
6. Ka-W5b
7. Ka-S1a
8. Ka-S1b

Three-Point Cliques
1. Ka-W1a-S1a
2. Ka-W1b-S1a
3. Ka-W1b-S1b
4. Ka-W1d-S1a
5. Ka-W2a-S1a
6. Ka-W3-S1a
7. Ka-W5b-S1a

Three-Point Semicliques
1. Ka-W1a-W1b
2. Ka-W1a-W1d
3. Ka-W1a-W2a
4. Ka-W1a-W3
5. Ka-W1a-W5b
6. Ka-W1a-S1b
7. Ka-W1b-W1d
8. Ka-W1b-W2a

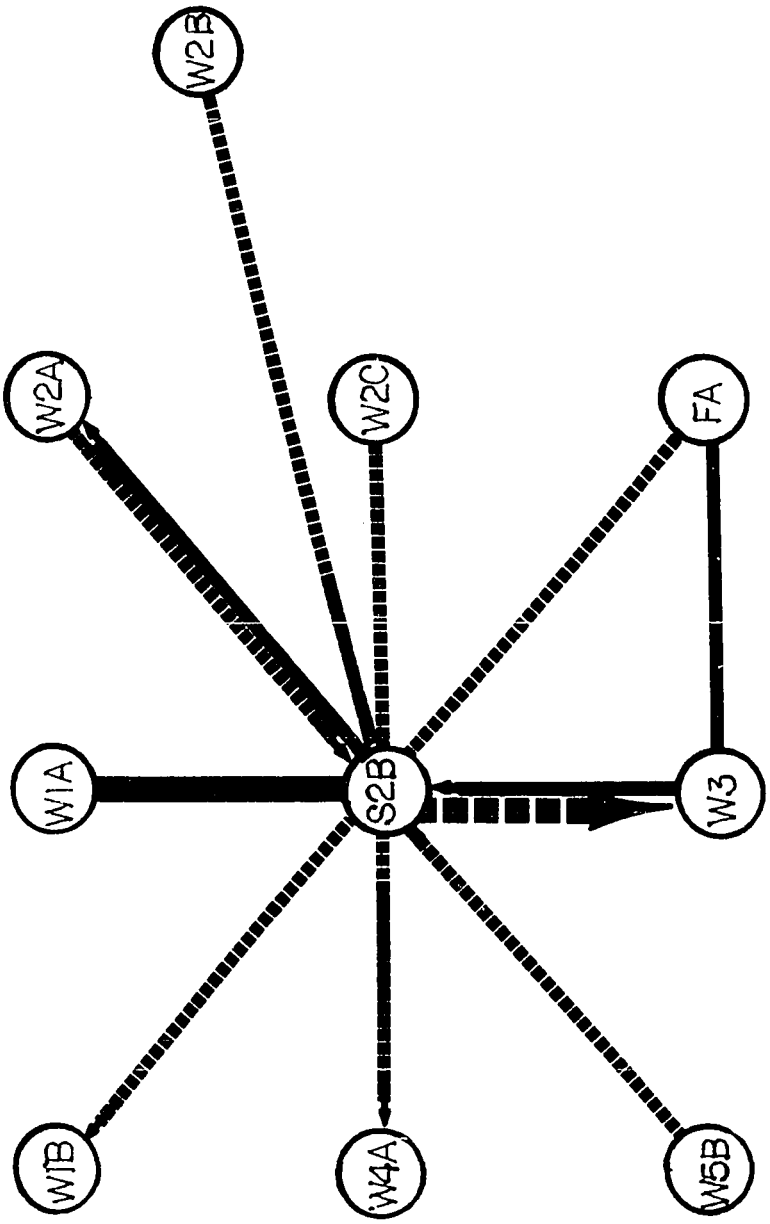


FIGURE 18 PRIMARY ZONE S2B

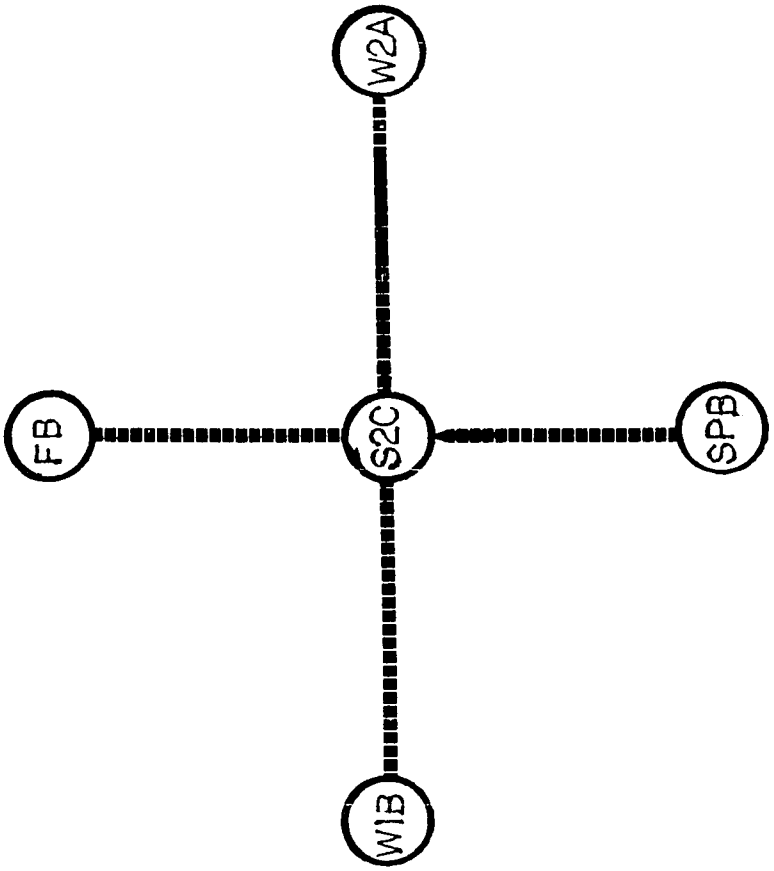


FIGURE 19 PRIMARY ZONE S2C

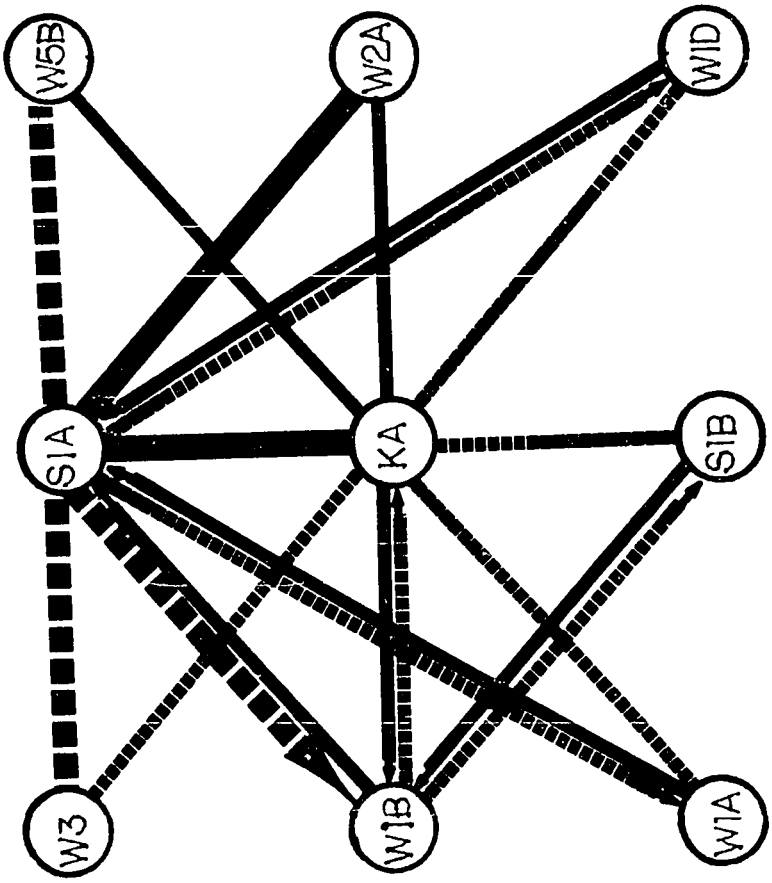


FIGURE 20 PRIMARY ZONE KA

Four-Point Semicliques
1. Ka-W1a-S1a-W1b
2. Ka-W1a-S1a-W1d
3. Ka-W1a-S1a-W2a
4. Ka-W1a-S1a-W3
5. Ka-W1a-S1a-W5b
6. Ka-W1b-S1a-W1d
7. Ka-W1b-S1a-W2a
8. Ka-W1b-S1a-W3
9. Ka-W1b-S1a-W5b
10. Ka-W1d-S1a-W2a
11. Ka-W1d-S1a-W3
12. Ka-W1d-S1a-W5b
13. Ka-W2a-S1a-W3
14. Ka-W2a-S1a-W5b
15. Ka-W3-S1a-W5b
16. Ka-S1a-W1b-S1b

Three-Point Semicliques (continued)
9. Ka-W1b-W3
10. Ka-W1b-W5b
11. Ka-W1d-W2a
12. Ka-W1d-W3
13. Ka-W1d-W5b
14. Ka-W1d-S1b
15. Ka-W2a-W3
16. Ka-W2a-W5b
17. Ka-W2a-S1b
18. Ka-W3-W5b
19. Ka-W3-S1b
20. Ka-W5b-S1b
21. Ka-S1a-S1b

Figure 21 is C_2, with W4b its weakening point and Kb its strengthening point. All other points are neutral points. The digraph in figure 21 encompasses all the structural components containing Kb to be found below:

Two-Point Cliques
1. Kb-W1a
2. Kb-W1b
3. Kb-W3
4. Kb-W4a
5. Kb-S1a

Three-Point Cliques
1. Kb-W1a-S1a
2. Kb-W1b-S1a
3. Kb-W3-S1a
4. Kb-W4a-S1a

Three-Point Semicliques
1. Kb-W1a-W1b
2. Kb-W1a-W3
3. Kb-W1a-W4a
4. Kb-W1b-W3
5. Kb-W1b-W4a
6. Kb-W3-W4a

Three-Point Blocks
1. Kb-W1a-SW
2. Kb-W1b-SW
3. Kb-W2a-S1a
4. Kb-W2a-SW
5. Kb-W3-SW

Three-Point Semiblocks
1. Kb-W1a-W2a
2. Kb-W1a-W4b
3. Kb-W1b-W2a
4. Kb-W1b-W4b
5. Kb-W2a-W4b
6. Kb-W3-W2a
7. Kb-W3-W4b
8. Kb-W4a-W2a
9. Kb-W4a-W4b
10. Kb-W4a-SW
11. Kb-W4b-SW
12. Kb-W4b-S1a

Four-Point Semicliques
1. Kb-W1a-S1a-W1b
2. Kb-W1a-S1a-W3
3. Kb-W1a-S1a-W4a
4. Kb-W1b-S1a-W3
5. Kb-W1b-S1a-W4a
6. Kb-W3-S1a-W4a

Four-Point Semiblocks
1. Kb-W1a-SW-W1b
2. Kb-W1a-SW-W2a
3. Kb-W1a-SW-W3
4. Kb-W1a-SW-S1a
5. Kb-W1b-SW-W2a
6. Kb-W1b-SW-W3
7. Kb-W1b-SW-S1a
8. Kb-W2a-SW-W3
9. Kb-W2a-SW-S1a
10. Kb-W3-SW-S1a

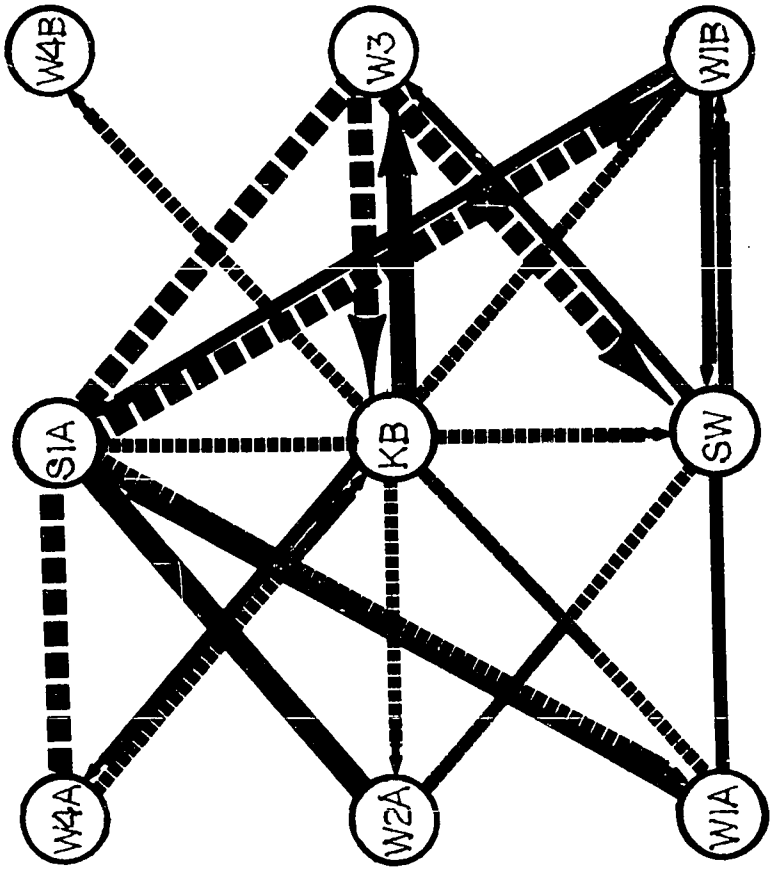


FIGURE 21 PRIMARY ZONE KB

Figure 22 is C_3, with all points neutral points. Kc's primary zone digraph includes these structural components:

Two-Point Cliques
1. Kc-W3
2. Kc-W4a
3. Kc-S1a

Three-Point Cliques
1. Kc-W3-S1a
2. Kc-W4a-S1a

Three-Point Semicliques
1. Kc-W3-W4a

Four-Point Semicliques
1. Kc-W3-S1a-W4a

Figure 23 is C_2, with Kd a strengthening point and all other points neutral points. Below are listed the structural components of figure 23.

Two-Point Cliques
1. Kd-W2a
2. Kd-W4a

Three-Point Semicliques
1. Kd-W2a-W4a

Three-Point Semiblocks
1. Kd-W2a-W5a
2. Kd-W2a-Fb
3. Kd-W4a-W5a
4. Kd-W4a-Fb
5. Kd-W5a-Fb

Figure 24 is C_3, with all its points neutral points. The components of this digraph containing Fa are:

Two-Point Cliques
1. Fa-W3
2. Fa-S1a
3. Fa-S2a
4. Fa-S2b
5. Fa-SW

Three-Point Cliques
1. Fa-W3-S1a
2. Fa-W3-S2a
3. Fa-W3-S2b
4. Fa-W3-SW

Three-Point Semicliques
1. Fa-S1a-S2a
2. Fa-S1a-S2b
3. Fa-S1a-SW
4. Fa-S2a-S2b
5. Fa-S2a-SW
6. Fa-S2b-SW

Four-Point Semicliques
1. Fa-W3-S1a-S2a
2. Fa-W3-S1a-S2b
3. Fa-W3-S1a-SW
4. Fa-W3-S2a-S2b
5. Fa-W3-S2a-SW
6. Fa-W3-S2b-SW

Figure 25 is C_2, with Kd its weakening point, Fb its strengthening point, and all the others neutral points. Listed below are the structural components of the primary zone of Fb.

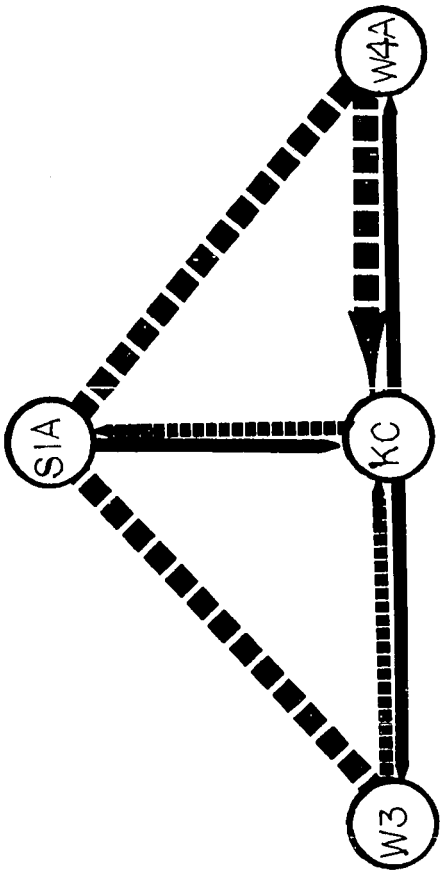


FIGURE 22 PRIMARY ZONE KC

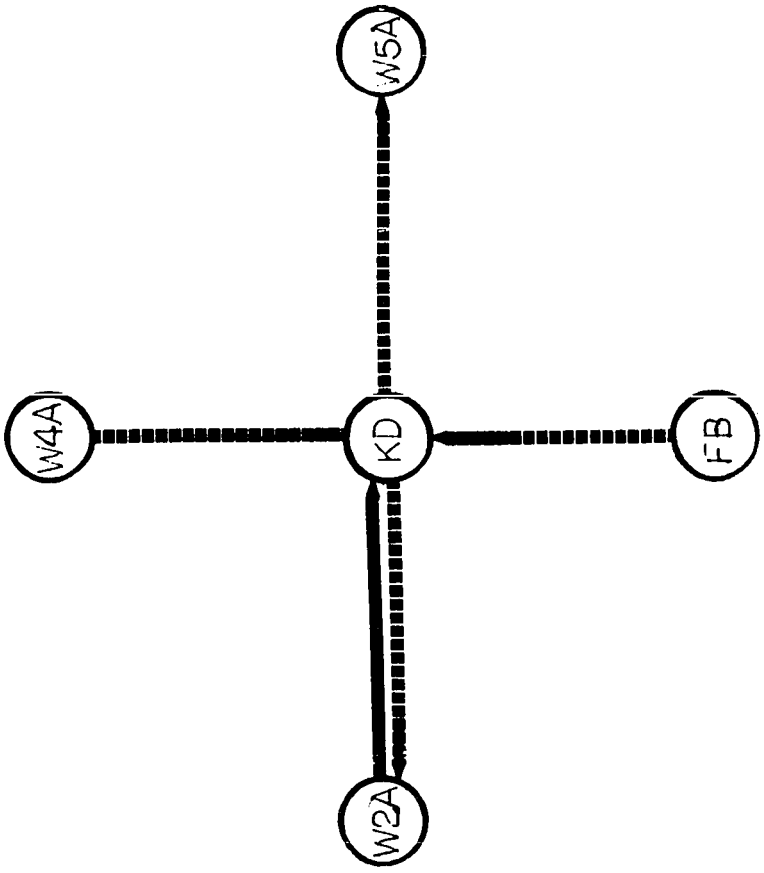


FIGURE 23 PRIMARY ZONE KD

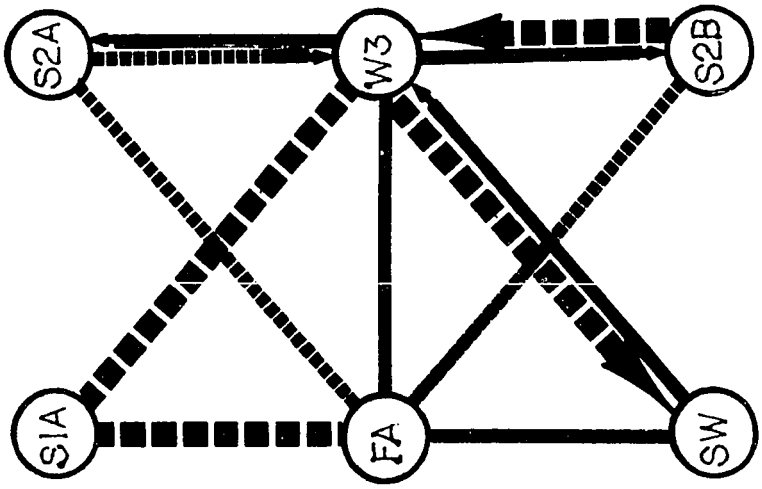


FIGURE 24 PRIMARY ZONE FA

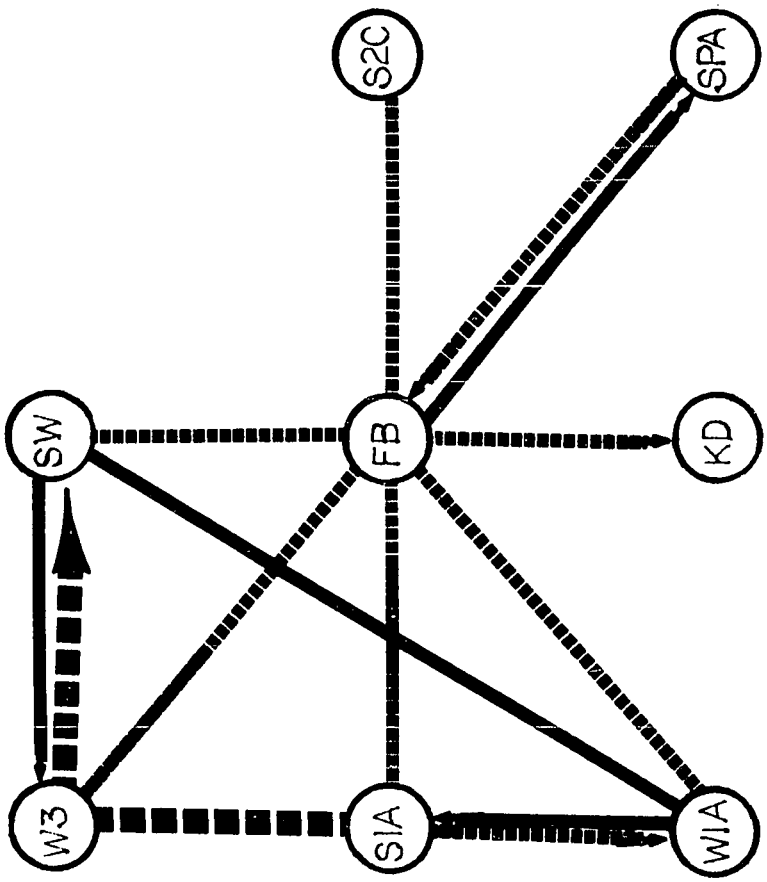


FIGURE 25 PRIMARY ZONE FB

Two-Point Cliques
1. Fb-W1a
2. Fb-W3
3. Fb-S1a
4. Fb-S2c
5. Fb-SPa
6. Fb-SW

Three-Point Cliques
1. Fb-W1a-S1a
2. Fb-W1a-SW
3. Fb-W3-S1a
4. Fb-W3-SW

Three-Point Semicliques
1. Fb-W1a-W3
2. Fb-W1a-S2c
3. Fb-W1a-SPa
4. Fb-W3-S2c
5. Fb-W3-SPa
6. Fb-S1a-S2c
7. Fb-S1a-SPa
8. Fb-S1a-SW
9. Fb-S2c-SPa
10. Fb-S2c-SW
11. Fb-SPa-SW

Three-Point Semiblocks
1. Fb-W1a-kd
2. Fb-W3-Kd
3. Fb-S1a-Kd
4. Fb-S2c-Kd
5. Fb-SPa-Kd
6. Fb-SW-Kd

Figure 26 is C_2, with Fc a strengthening point, S2a a weakening point, and S1a a neutral point. Its structural components are:

Two-Point Cliques
1. Fc-S1a

Three-Point Semiblocks
1. Fc-S1a-S2a

Figure 27 is C_3, with all neutral points except the strengthening point: SPa. Here are the structural components of this digraph:

Two-Point Cliques
1. SPa-W2a
2. SPa-W4a
3. SPa-S2a
4. SPa-Fb

Three-Point Cliques
1. SPa-W4a-S2a

Three-Point Semicliques
1. SPa-W2a-W4a
2. SPa-W2a-Fb
3. SPa-W4a-Fb
4. SPa-S2a-Fb

Three-Point Blocks
1. SPa-W2a-S2a

Four-Point Semiblocks
1. SPa-W2a-S2a-W4a

Figure 28 is C_2, with SPb a strengthening point, S2c a weakening point, and W3 a neutral point. The structural components of figure 28 include:

Two-Point Cliques
1. SPb-W3

Three-Point Semiblocks
1. SPb-W3-S2c

Figure 29 is C_3, with both points strengthening points. It consists of only one structural component:

Two-Point Cliques
1. SPc-S1a

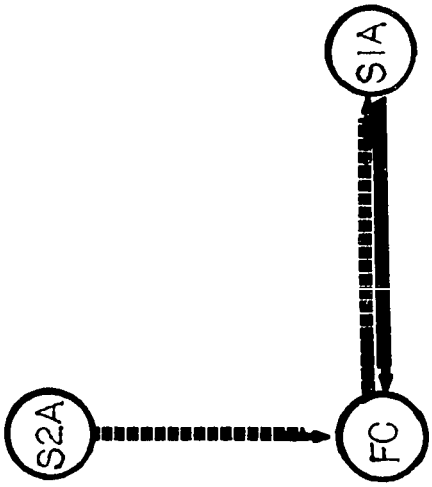


FIGURE 26 PRIMARY ZONE FC

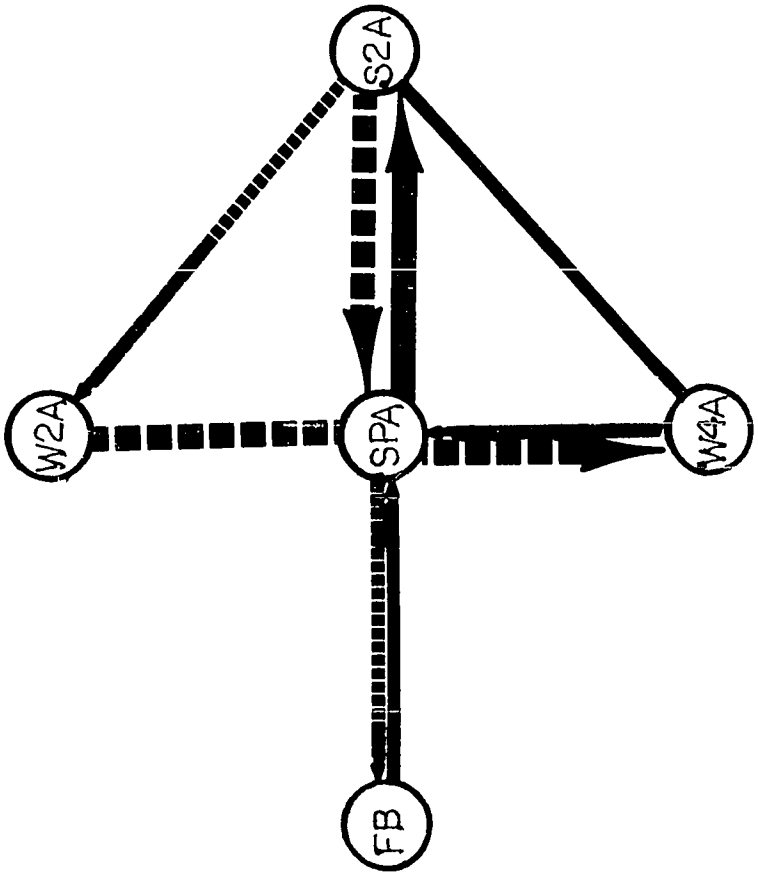


FIGURE 27 PRIMARY ZONE SPA

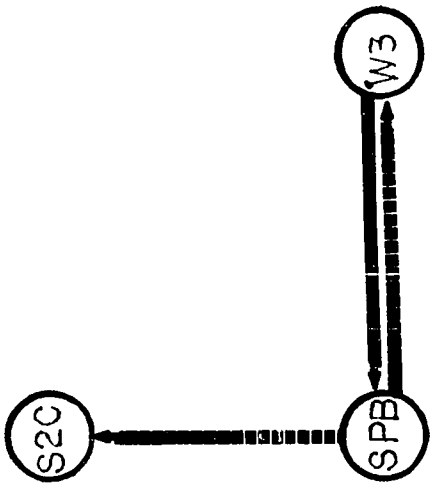


FIGURE 28 PRIMARY ZONE SPB

FIGURE 29 PRIMARY ZONE SPC

Figure 30 is C_1. W2d and W5a are weakening points, and SW is a strengthening point. The rest are neutral points. The various components of this digraph that include SW are:

Two-Point Cliques
1. SW-W1a
2. SW-W1b
3. SW-W1c
4. SW-W2a
5. SW-W2b
6. SW-W3
7. SW-W5b
8. SW-Fa
9. SW-Fb

Three-Point Cliques
1. SW-W1a-Fb
2. SW-W3-Fa
3. SW-W3-Fb

Four-Point Semicliques
1. SW-W1a-Fb-W3
2. SW-W3-Fa-Fb

Three-Point Blocks
1. SW-W1a-Kb
2. SW-W1b-Kb
3. SW-W2a-Kb
4. SW-W3-Kb

Four-Point Semiblocks
1. SW-W1a-Kb-W1b
2. SW-W1a-Kb-W2a
3. SW-W1a-Kb-W3
4. SW-W1a-Kb-Fb
5. SW-W1b-Kb-W2a
6. SW-W1b-Kb-W3
7. SW-W2a-Kb-W3
8. SW-W3-Kb-Fa
9. SW-W3-Kb-Fb

Three-Point Semicliques
1. SW-W1a-W1b
2. SW-W1a-W1c
3. SW-W1a-W2a
4. SW-W1a-W2b
5. SW-W1a-W3
6. SW-W1a-W5b
7. SW-W1a-Fa
8. SW-W1b-W1c
9. SW-W1b-W2a
10. SW-W1b-W2b
11. SW-W1b-W3
12. SW-W1b-W5b
13. SW-W1b-Fa
14. SW-W1b-Fb
15. SW-W1c-W2a
16. SW-W1c-W2b
17. SW-W1c-W3
18. SW-W1c-W5b
19. SW-W1c-Fa
20. SW-W1c-Fb
21. SW-W2a-W2b
22. SW-W2a-W3
23. SW-W2a-W5b
24. SW-W2a-Fa
25. SW-W2a-Fb
26. SW-W2b-W3
27. SW-W2b-W5b
28. SW-W2b-Fa
29. SW-W2b-Fb
30. SW-W3-W5b
31. SW-W5b-Fa
32. SW-W5b-Fb
33. SW-Fa-Fb

Three-Point Semiblocks
1. SW-W1a-W2d
2. SW-W1a-W5a
3. SW-W1b-W2d
4. SW-W1b-W5a
5. SW-W1c-W2d
6. SW-W1c-W5a
7. SW-W1c-Kb
8. SW-W2a-W2d
9. SW-W2a-W5a
10. SW-W2b-W2d
11. SW-W2b-W5a
12. SW-W2b-Kb
13. SW-W2d-W5a
14. SW-W2d-Kb
15. SW-W3-W2d
16. SW-W3-W5a
17. SW-W5a-Kb
18. SW-W5a-W5b
19. SW-W5b-W2d
20. SW-W5b-Kb
21. SW-Fa-W2d
22. SW-Fa-W5a
23. SW-Fa-Kb
24. SW-Fb-W2d
25. SW-Fb-W5a
26. SW-Fb-Kb

Figure 31 is C_3, both of its points are strengthening points, and it contains only one structural component:

Two-Point Cliques
1. IN-W1c

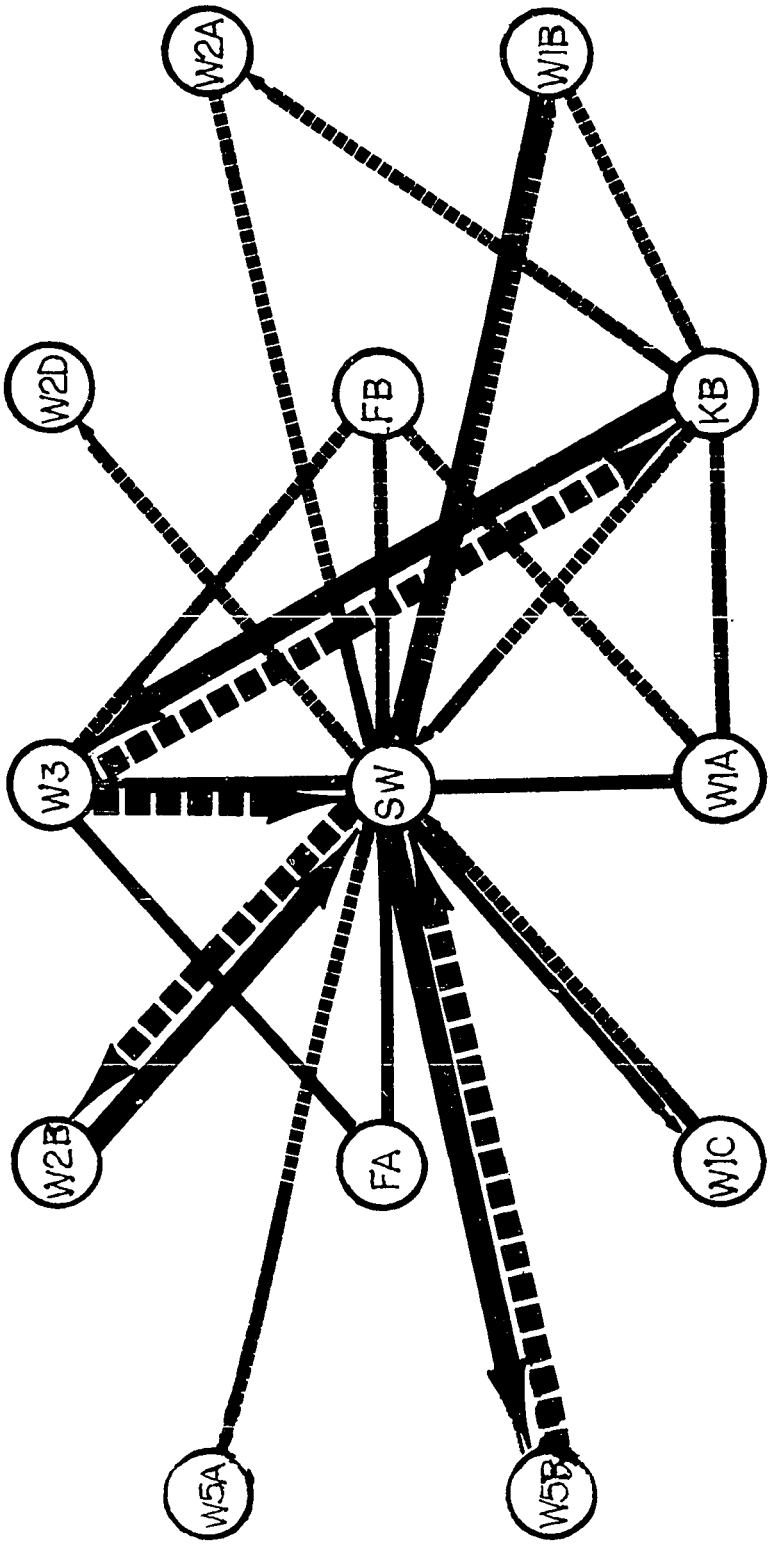


FIGURE 30 PRIMARY ZONE SW

FIGURE 31 PRIMARY ZONE IN

Figure 32 illustrates all interlineage alliances at a two-bond level or higher, and thus represents completely the alliance pattern on the atoll. Each of the primary zone digraphs for every lineage (figures 1-31) is contained in figure 32, and therefore, its structural components equal the sum total of the structural components of figures 1-31.

A number of interesting things become apparent in figure 32. First is that no three-bond or higher relationship goes unreciprocated. Lineages do not heavily invest their human and land resources with another lineage unless or until such an investment "pays dividends," i.e., unless or until it is reciprocated.

The second interesting fact to emerge from figure 32 is that the fifteen unreciprocated two-bond relationships can be seen to fall into three classes. Six of the fifteen have not been reciprocated for the simple reason that one lineage died out (or is about to die out) before this could take place. Included here are the relationships between S2a-Fc, S2b-W4a, S2b-W1b, Kb-W4b, SPb-S2c, and SW-W2d. Another four of the fifteen cases seem unlikely to be reciprocated in the near future, since one lineage involved (S2a) has only three potential future marriage partners to offer other lineages. Thus S2a-W1b, S2a-W2a, S2a-W2b and S2a-W2c make up a second class. The third class of unreciprocated two-bond relationships consists of what might be viewed as "budding" alliances. In these cases, the lineages involved all have several potential future marriage partners to offer and none of the lineages is in immediate danger of extinction. Relationships included here are Kb-SW, Kb-W2a, Kd-W5a, SW-W5a and Fb-Kd. Note that two of these pairs include W5a--an immigrant client lineage--and probably represent a continuation of W5a's integration into the Namoluk alliance system.

Perhaps the most interesting datum contained in figure 32 is the

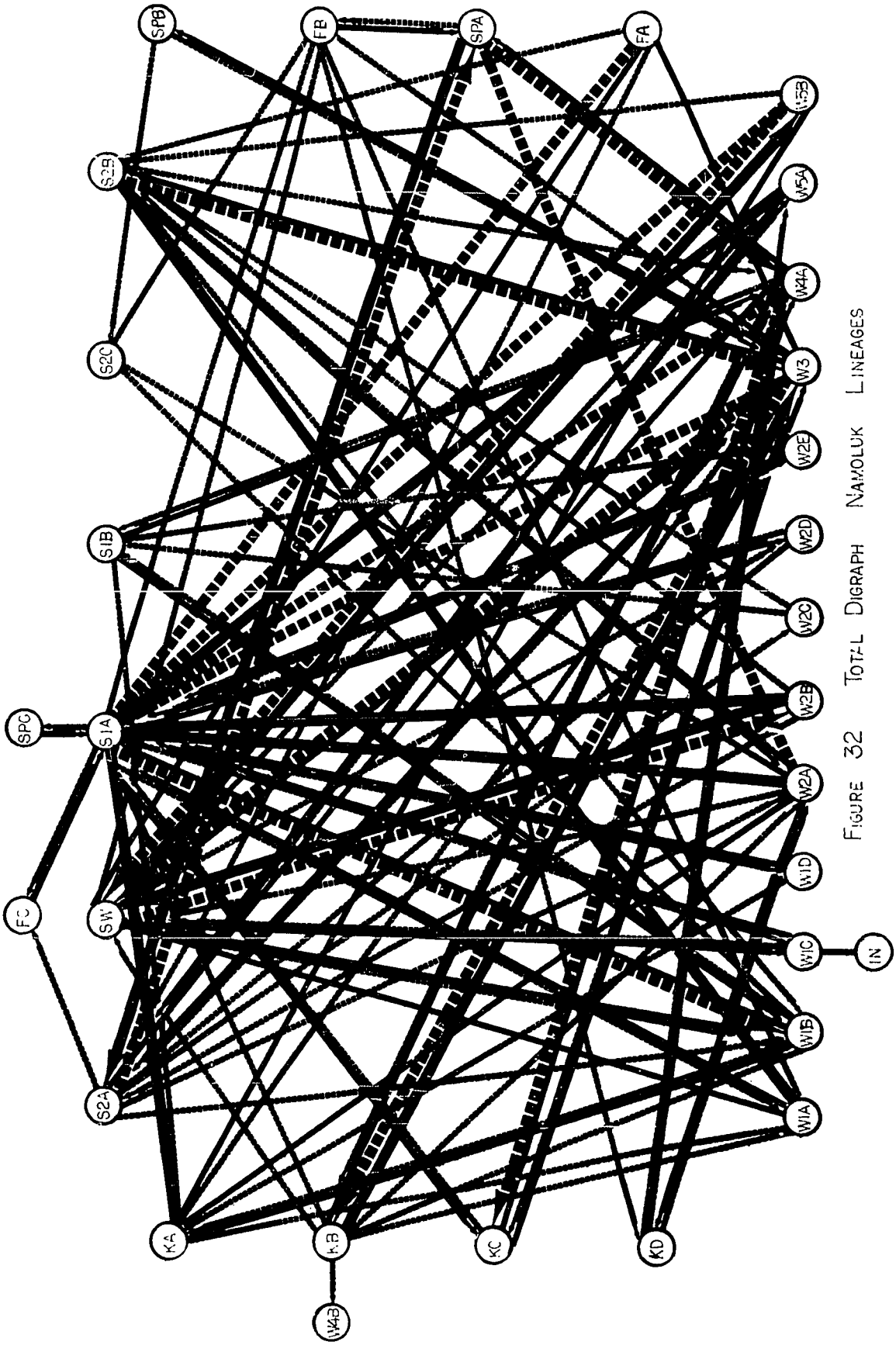


FIGURE 32 TOTAL DIGRAPH NAMOLUK LINEAGES

illustration that all thirty-one lineages--extinct or extant--are woven into the total alliance pattern. Only three lineages, all of which are extinct or about to become so, are peripheral to the digraph in the sense that they are joined to only one other lineage. Figure 32 is C_2, however, removal of only one weakening point--W4b--makes this figure C_3. Since, for practical purposes, W4b has ceased to exist on Namoluk, it is fair to say that all of the lineages on Namoluk are strongly connected at a two-bond level digraph.[5]

The distribution of all possible bonding relationships between lineages in figure 32 is given below:

(1) Reciprocal five-bond	5
(2) Five-bond/four-bond	4
(3) Reciprocal four-bond	5
(4) Four-bond/three-bond	5
(5) Reciprocal three-bond	7
(6) Three-bond/two-bond	21
(7) Reciprocal two-bond	24
(8) One-way two-bond	15

This distribution reveals a tendency for lineages to establish only a few strong alliances (one or perhaps two), and otherwise to scatter their resources rather widely in a number of weaker alliances. This is akin to investing in a number of different stocks and securities to protect against a loss in one. Should a lineage's strongest alliance partner die out, other lesser alliance partners will be called on to fill in in its place. For those lineages having at least one reciprocal three-bond clique or higher, the average number of such alliances is under three and the median is under two.[6]

A clearer picture of how tightly woven together Namoluk descent groups are is obtained in figures 33 and 34. In figure 33, subclans instead of

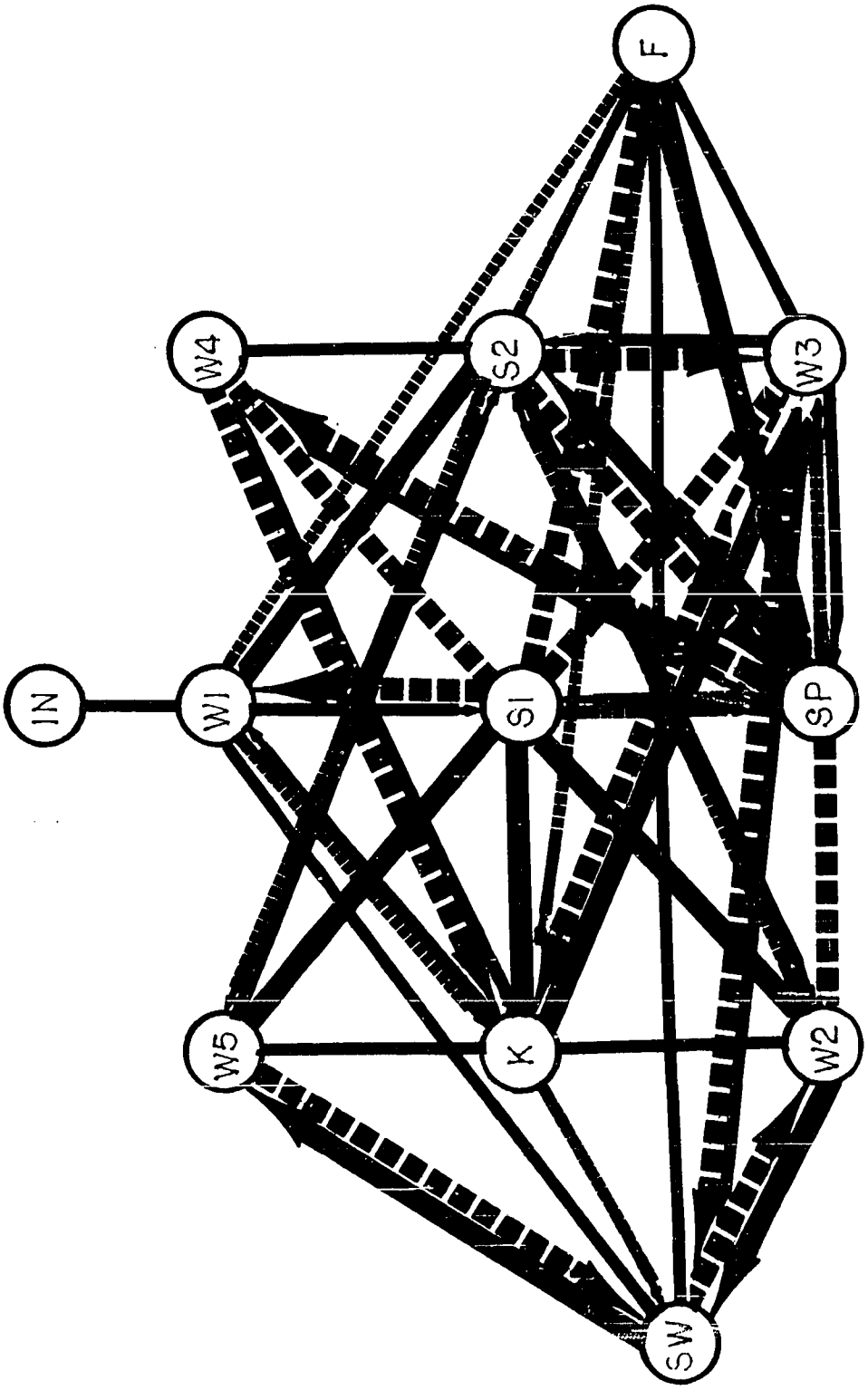


FIGURE 33 TOTAL DIGRAPH NAMOLUK SUBCLANS

lineages are represented, with the bonds shown indicating the strongest bonds between constituent lineages of these subclans. At this level, the only peripheral subclan is IN, a subclan that verges on extinction. Figure 33 reveals that the following subclans have no direct alliance relationships binding them together:

(1) W1-SP

(2) W2-F

(3) W4-F and W4-SW

(4) W5-F and W5-SP

(5) S1-SW

(6) S2-SW and S2-K

(7) K-SP

(8) SP-SW

(9) IN with all except W1

Another thing shown by this figure is that the links between F-K and K-SW are only tenuous unreciprocated two-bonds. All points in figure 33 are neutral points and it is C_3.

Figure 34 abstracts the data contained in figure 32 a step further by moving to the clan level. The strength of the bonds represented are the strongest that exist between any two constituent subclans or lineages of the clans. This digraph is C_3, with every point a neutral point. Here at the clan level, it is readily seen that only a few interclan relationships do not exist. Immediately obvious is IN's lack of ties to any clan but W, but again, IN will die out in the current generation and thus has become peripheral to the entire alliance system. Those interclan relationships that are lacking are listed below.

(1) S-SW

(2) K-SP

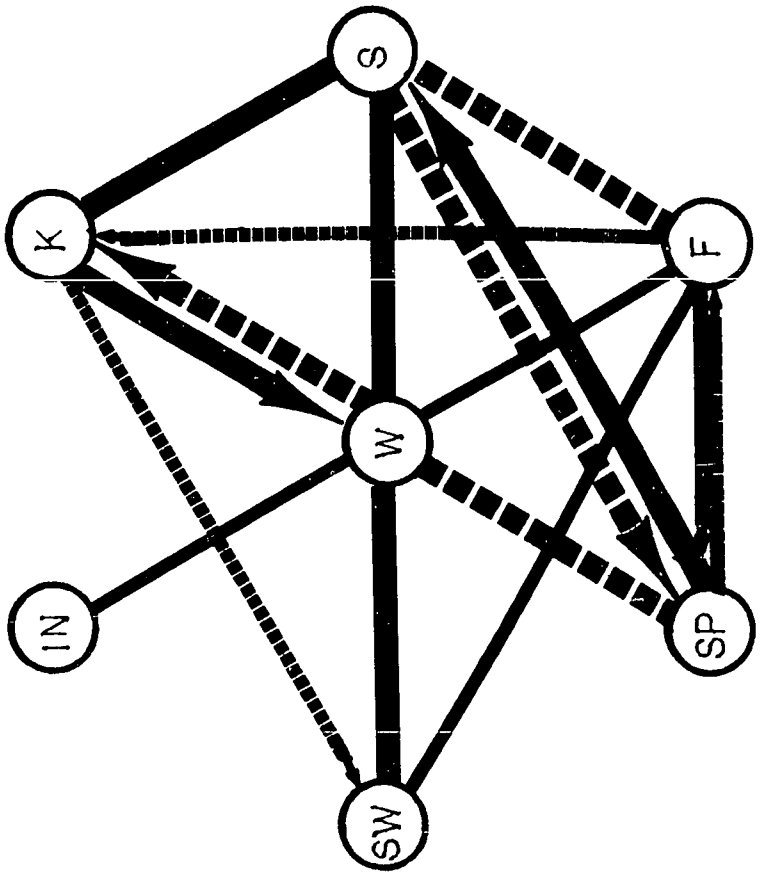


FIGURE 34 TOTAL DIGRAPH NAMOLUK CLANS

(3) SP-SW

(4) IN with all except W

Just as at the subclan level, F-K and K-SW are bound only by "budding" alliances.

Figure 35 shows the interlineage alliance pattern on the atoll at a three-bond level. By eliminating all two-bond lines from figure 32, only three lineages drop out: W2c, W4b and S2c. S2c is extinct, W4b will become extinct on the death of its lone survivor, and W2c was reduced to a single surviving woman in the second ascending generation. This woman has proved exceptionally fertile, producing eight living offspring, three of whom have also given birth. Thus demographic considerations seem to explain in part why these three lineages have no three-bond alliances or connections.

At the three-bond level, a great many lineages become peripheral, that is they are bound to other lineages only by a single one-way link. These peripheral lineages in figure 35 include W1d, W2d, W2e, Kd, Fb, Fc, SPb and SPc. In addition, IN is bound into the digraph by a lone reciprocal link. Three of these (W2e, Fc, SPc) are extinct, and two (W2d, IN) are about to become so. W1d is a recent immigrant lineage with numerous young children that has only contracted six marriages on Namoluk so far, and it may be anticipated that the strength of W1d's alliances will increase as more of its children reach marriageable age. Kd and Fb are among those lineages who have spread their resources over several weaker alliances, instead of concentrating them in one or two stronger ones, and neither has built up a reciprocal three-bond connection with another lineage. SPb's problem has been mainly one of "small capital" with respect to human resources. This seems to explain the fact that SPb has not become reciprocally integrated into Namoluk's three-bond alliance system in the time since it immigrated from Etal six generations ago.

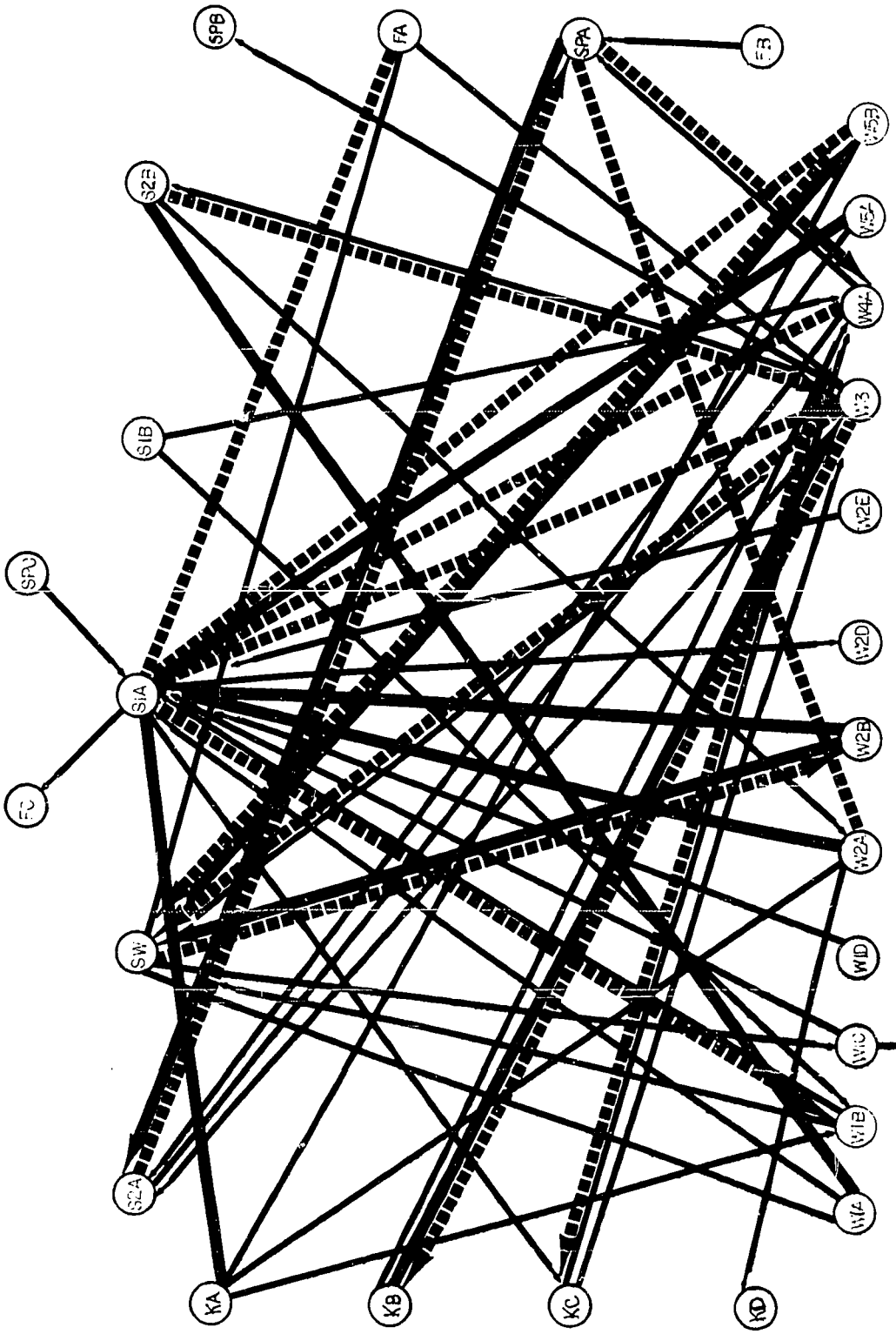


FIGURE 35 THREE-BOND LEVEL D

The number of cliques, semicliques, blocks, and four-point semiblocks in figure 35 show very strong alliances(all two-bonds are eliminated), and these alliances are enumerated below. Since all the three-point semiblocks are either C_2 or C_1, they have not been listed here.

Two-Point Cliques
1. W1a-S2b
2. W1a-SW
3. W1b-S1a
4. W1c-IN
5. W2a-S1a
6. W2a-Ka
7. W2a-SPa
8. W2b-S1a
9. W2b-SW
10. W3-S1a
11. W3-S2b
12. W3-Kb
13. W3-Fa
14. W3-SW
15. W4a-S1a
16. W4a-S2a
17. W4a-Kc
18. W4a-SPa
19. W5a-S1a
20. W5b-S1a
21. W5b-Ka
22. W5b-SW
23. S1a-Fa
24. S2a-SPa
25. Ka-S1a
26. Fa-SW

Three-Point Cliques
1. S1a-Ka-W5b
2. S1a-Ka-W2a
3. S1a-Fa-W3
4. S2a-SPa-W4a
5. SW-Fa-W3

Three-Point Blocks
1. S1a-Ka-W1b
2. S1a-Kc-W3
3. S1a-Kc-W4a

Four-Point Semicliques
1. Ka-W2a-S1a-W5b
2. Fa-W3-SW-S1a

Four-Point Semiblocks
1. Kc-W3-S1a-W4a

Three-Point Semicliques
1. W1a-SW-S2b
2. W1a-SPa-Ka
3. W2a-SPa-S1a
4. W2b-S1a-SW
5. W3-S1a-S2b
6. W3-S2b-Kb
7. W3-S1a-Kb
8. W3-SW-Kb
9. W3-S2b-SW
10. W3-S1a-SW
11. W3-Kb-Fa
12. W4a-Kc-S2a
13. W4a-Kc-SPa
14. W4a-S1a-S2a
15. W4a-S1a-SPa
16. W5b-S1a-SW
17. W5b-Ka-SW
18. S1a-Ka-W2b
19. S1a-Ka-W3
20. S1a-Ka-W5a
21. S1a-Ka-Fa
22. S1a-Ka-W4a
23. S1a-W3-W2b
24. S1a-W3-W5a
25. S1a-W3-W5b
26. S1a-W3-W1b
27. S1a-W3-W2a
28. S1a-W3-W4a
29. S1a-W2b-W5a
30. S1a-W2b-W5b
31. S1a-W2b-W1b
32. S1a-W2b-Fa
33. S1a-W2b-W2a
34. S1a-W2b-W4a
35. S1a-W5b-W5a
36. S1a-W5b-W1b
37. S1a-W5b-Fa
38. S1a-W5b-W2a
39. S1a-W5b-W4a
40. S1a-W5a-W1b

Three-Point Semicliques (continued)
41. S1a-W5a-Fa
42. S1a-W5a-W2a
43. S1a-W5a-W4a
44. S1a-W1b-Fa
45. S1a-W1b-W2a
46. S1a-W1b-W4a
47. S1a-Fa-W2a
48. S1a-Fa-W4a
49. S1a-W2a-W4a
50. S2b-W3-W1a
51. Ka-W2a-W5b
52. Fa-S1a-SW
53. SPa-W4a-W2a
54. SW-W1a-W3
55. SW-W1a-W2b
56. SW-W1a-W5b
57. SW-W1a-Fa
58. SW-W3-W2b
59. SW-W3-W5b
60. SW-W2b-W5b
61. SW-W2b-Fa
62. SW-W5b-Fa

These data show that 19/31 lineages on Namoluk are joined directly by a clique or a block, or indirectly by a semiclique or a four-point semiblock, at a three-bond or higher level. Lineages absent from this group are: W1d, W2c, W2d, W2e, W4b, S1b, S2c, Kd, Fb, Fc, SPb and SPc. Again, it must be pointed out that one half of these absent lineages are extinct or nearly so, and in addition, one of them is a recent immigrant client lineage.

Figures 36 and 37 complete the progression of eliminating weaker lines from the digraph in figure 32. Figure 36 depicts Namoluk lineages that are joined at a four-bond level (17/31 lineages), and figure 37 shows this at a five-bond level (13/31 lineages). The digraph representing Namoluk interlineage alliance does not become disconnected until it reaches a five-bond level! Even so, nearly one half of the lineages under analysis are joined to at least one other lineage by a five-bond relationship.

Tables 17 and 18 summarize how the lineages of Namoluk are connected together. An entry of 3 in the matrix of table 17 means that A and B are in a

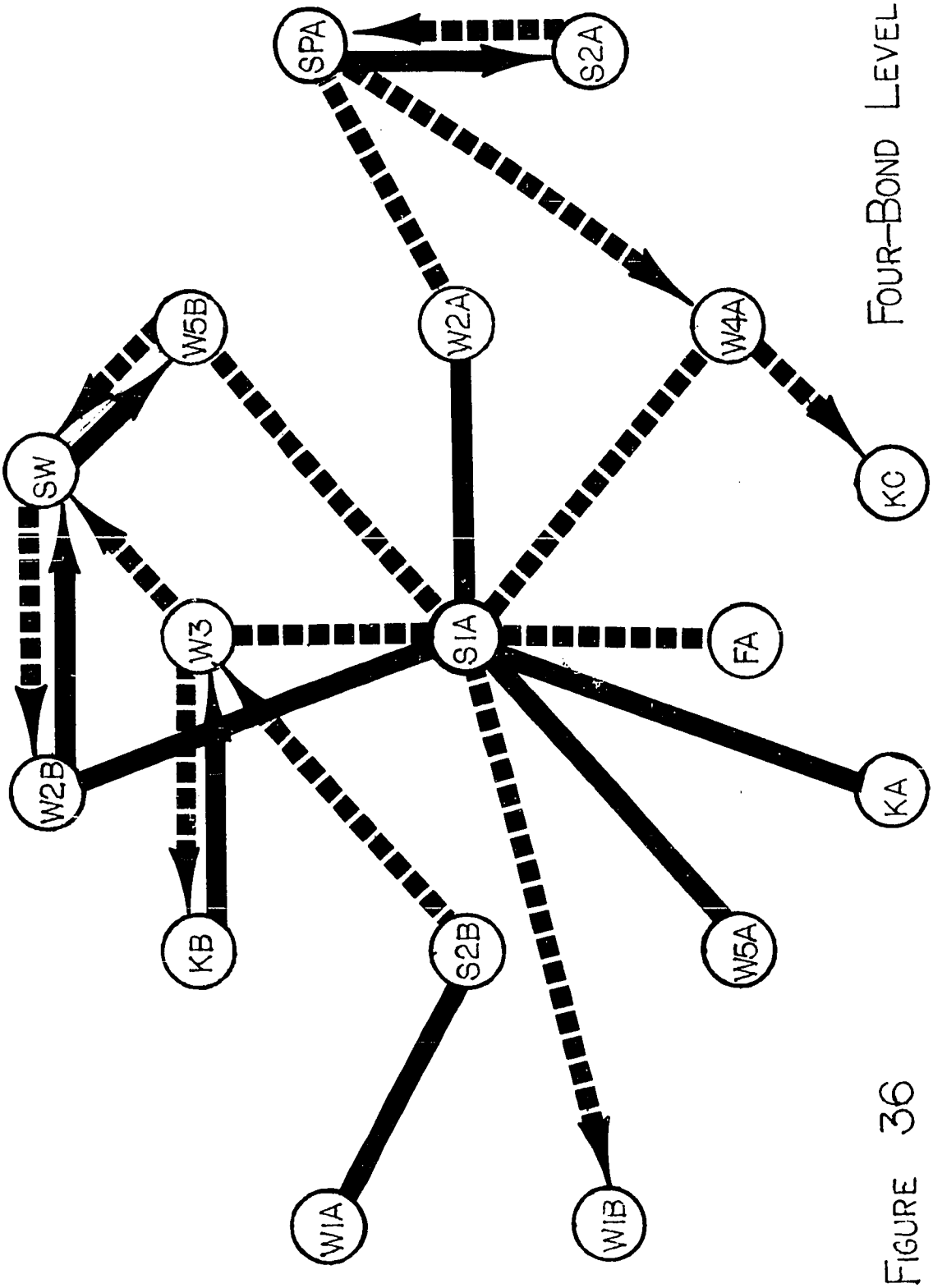


FIGURE 36 FOUR-BOND LEVEL D

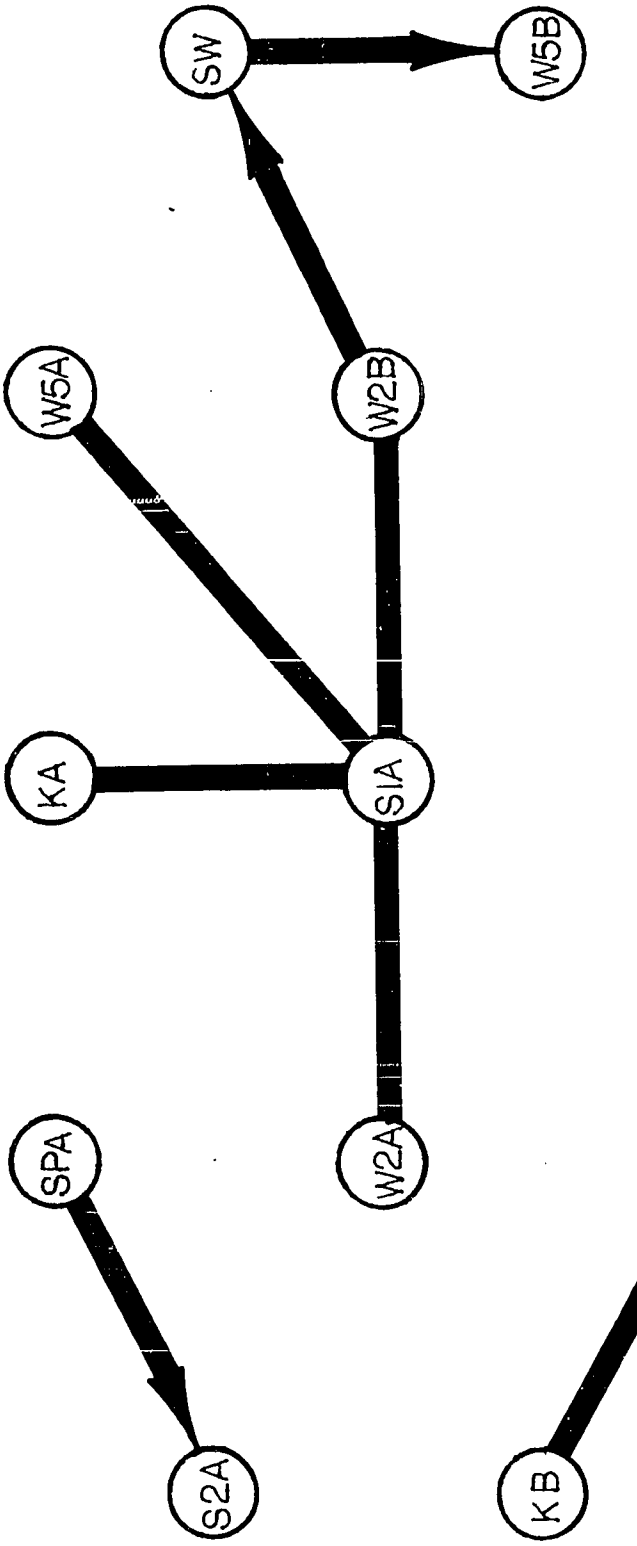


FIGURE 37 FIVE-BOND LEVEL D

strongly connected structural component of D (figure 32). In similar fashion, an entry of 2 means A and B are unilaterally connected, and entry of 1 means A and B are weakly connected, and no entry means they are not joined together in the same two-step structural component of D. Keep in mind that all the lineages in figure 32 are unilaterally connected by greater than two-step links. The entries in table 17 refer only to structural components of figure 32, and not to the digraph as a whole.

Because we are dealing here with two-step connectedness (semicliques and semiblocks), as well as with direct connectedness (cliques and blocks), it is possible to speak of two lineages of the same subclan or clan as being strongly connected, weakly connected, and so on. Tables 17 and 18 show four things. First, table 17 shows how the various lineages of the same subclan and the different subclans of a single clan are linked together in structural solidarity via semicliques and semiblocks. Second, table 17 illustrates the strongest connectivity that exists between every two lineages in figure 32. Third, table 18 depicts how each lineage is connected to certain others in direct alliance via a clique or a block, and fourth, table 18 shows how the different lineages of a subclan and the different subclans of a clan reinforce one another's alliances. In both tables, the strongest connectivity is shown, where two lineages are connected in several ways. When a lineage is connected to all of the lineages in another subclan by a clique, block, semiclique or semiblock, it will be said to be "completely connected" to that subclan.

The first data to be examined are those in table 17 that show how intrasubclan and intraclan solidarity is promoted by the alliances entered into by their constituent members. For example, W2a and W2b both are allied by cliques with S1a at a reciprocal five-bond level. This strong semiclique (S1a-W2a-W2b) places W2a and W2b into an indirect two-step structural alliance that reconfirms

TABLE 17

GREATEST STRENGTH OF CONNECTIVITY BETWEEN NAMOLUK LINEAGES

LINEAGE	W1a	W1b	W1c	W1d	W2a	W2b	W2c	W2d	W2e	W3	W4a	W4b	W5a	W5b	S1a	S1b	S2a	S2b	S2c	Ka	Kb	Kc	Kd	Fa	Fb	Fc	SPa	SPb	SPc	SW	IN
W1a		3	3	3	3	3	3	3	3	3	3	2	3	3	3	3		3	3	3	3	3	2	3	3	3		3	3		
W1b	3		3	3	3	3	3	3	3	3	3	2	3	3	3	3	2	2	3	3	3	3		3	3	3	2	2	3	3	
W1c	3	3		3	3	3		3	3	3	3		3	3	3					3	3	3		3	3	3			3	3	3
W1d	3	3	3		3	3		3	3	3	3		3	3	3	3				3	3	3		3	3	3			3		
W2a	3	3	3	3		3	3	3	3	3	3	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	
W2b	3	3	3	3	3		3	3	3	3	3		3	3	3		2	3		3	3	3		3	3	3	2		3	3	
W2c	3	3			3	3		2	3	3	3		2	3		3	2	3		3				3		1	2				
W2d	3	3	3	3	3	3	2		3	3	3		3	3	3		3			3	3	3		3	3	3	3		3	2	
W2e	3	3	3	3	3	3	3	3		3	3		3	3	3	3				3	3	3		3	3	3			3		
W3	3	3	3	3	3	3	3	3	3		3	2	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	
W4a	3	3	3	3	3	3	3	3	3	3		2	3	3	3	3	3	2		3	3	3	3	3	3	3			3	2	
W4b	2	2			1					2	2				2						2									1	
W5a	3	3	3	3	3	3	2	3	3	3	3			3	3		3			3	3	3	2	3	3	3	3		3	2	
W5b	3	3	3	3	3	3	3	3	3	3	3		3		3	3		3		3	3	3		3	3	3			3	3	
S1a	3	3	3	3	3	3		3	3	3	3	2	3	3		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
S1b	3	3		3	3		3		3	3	3			3	3		3	3	3	3	3	3	3			3			3		
S2a		2			3	2	2	3		3	3		3		3	3		3	2	3	3	3	3	3	3	2	3	3		3	
S2b	3	2			3	3	3			3	2			3	3	3	3		3	3	3	3	3	3	3		3	3		3	
S2c	3	3			3					3					3	3	2	3		3	3		3		3		3	2		3	
Ka	3	3	3	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	3	
Kb	3	3	3	3	3	3		3	3	3	3	2	3	3	3	3	3	3	3	3		3	3	3	3	3	3	3	3	3	
Kc	3	3	3	3	3	3		3	3	3	3		3	3	3	3	3	3		3	3		3	3	3	3	3	3	3	3	
kd	2				3					2	3		2		3	3	3	3	3	3	3	3			2		3			3	
Fa	3	3	3	3	3	3	3	3	3	3	3		3	3	3		3	3		3	3	3			3	3	3	3	3	3	
Fb	3	3	3	3	3	3		3	3	3	3		3	3	3		3	3	3	3	3	3	2	3		3	3	3	3	3	
Fc	3	3	3	3	3	3	1	3	3	3	3		3	3	3		2			3	3	3		3	3		2		3		
SPa	3	2			3	2	2	3		3	3		3		3	3	3	3	3	3	3	3	3	3	3	3	2			3	
SPb		2			2					3					3		3	3	2	3	3	3		3	3					3	
SPc	3	3	3	3	3	3		3	3	3	3		3	3	3					3	3	3		3	3	3					
SW	3	3	3		3	3		2		3	2	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3		3	3		3
IN			3												3															3	

TABLE 18

NAMOLUK ATOLL CLIQUE AND BLOCK INTERLINEAGE ALLIANCES

	W1a	W1b	W1c	W1d	W2a	W2b	W2c	W2d	W2e	W3	W4a	W4b	W5a	W5b	S1a	S1b	S2a	S2b	S2c	Ka	Kb	Kc	Kd	Fa	Fb	Fc	SPa	SPb	SPc	SW	IN
W1a															X			X		X	X				X					X	
W1b															X	X			X	X	X									X	
W1c															X															X	X
W1d															X					X											
W2a															X		X*	X	X	X	X*		X				X			X	
W2b															X			X												X	
W2c																X		X													
W2d															X		X														
W2e															X	X															
W3															X		X	X		X	X	X		X	X			X		X	
W4a															X	X	X				X	X	X				X				
W4b																															
W5a															X		X														
W5b															X			X		X										X	
S1a	X	X	X	X	X	X		X	X	X	X				X	X				X	X	X		X	X	X		X			
S1b		X					X		X		X									X											
S2a					X*			X		X	X				X									X			X				
S2b	X				X	X	X			X						X								X							
S2c		X			X																				X						
Ka	X	X		X	X					X					X	X	X														
Kb	X	X			X*					X	X				X															X*	
Kc										X	X				X																
Kd					X						X																				
Fa										X					X		X	X												X	
Fb	X									X					X				X								X			X	
Fc															X																
SPa					X						X						X									X					
SPb										X																					
SPc															X																
SW	X	X	X		X	X				X							X				X*			X	X						
IN			X																												

X=clique
X*=block

and reinforced their kinship solidarity as members of 'one flesh and blood'. The structural solidarity created through alliance supports and strengthens the solidarity that already exists as a result of shared "close kinship."

Examination of the entries in table 17 shows all of the lineages in W1 subclan, and all of those in W5 subclan, to be bound together via two-step connectivity in structures that are C_3. All of the lineages in W2 subclan are interconnected C_3, except W2c-W2d that are C_2. The two W4 lineages are connected together C_2. W3 subclan is not under consideration since it is a single lineage. S1, K, and F subclans all have their solidarity reconfirmed via two-step internal connectedness that is C_3. The S2 lineages are C_3, except for S2a-S2c that are C_2. SW and IN each consist of one lineage only, to which this particular bit of analysis is irrelevant. Only SP subclan has no internal solidarity reinforcing bonds built up through two-step alliances, and this reflects SP's complete lack of mutually reinforcing alliances with other lineages to be discussed below.

Viewed from the clan level, the various subclans that make up W and S clans also reaffirm their internal solidarity through two-step structural connectedness. While exceptions do exist (W1c-W2c, W1c-W4b, W1d-W2c, W1d-W4b, W2b-W4b, W2c-W4b, W2d-W4b, W2e-W4b, W4b-W5a, W4b-W5b), generally speaking W lineages are all bound together into one solidary unit at a $C_2$and C_3 level. [7] The S subclans are all similarly connected at a C_3 level, except S2a-S2c which is C_2.

Next, on the basis of direct or indirect two-step connectivity, a discussion of "complete connectivity" for each lineage will be undertaken.

W1a is completely connected to S1, K, F and SW. W1b is completely connected to S1, S2, F, SP and SW. W1c is completely connected only to F, SW and IN. Finally, W1d is completely connected to S1 and F. Taken as a subclan, W1 is

completely connected with all of the non-Wenikar subclans on the atoll.

W2a is completely connected to S1, S2, K, F, SP and SW. W2b is so connected only to F and SW, while W2c is completely connected to no other subclan. W2d is completely connected to F and SW, while W2e is linked to S1 and F in like fashion. Together, W2 subclan is completely connected to all of the non-Wenikar subclans except IN.

W3, like W2, is completely connected to every non-Wenikar subclan except IN.

W4a is completely connected to S1, K, F and SW, while its companion lineage, W4b, is so connected only to SW. Thus W4 subclan is connected completely to only four of the seven non-Wenikar subclans: S1, K, F and SW.

W5a and W5b both are completely connected to F and SW. While W5a is connected completely to K, W5b is joined in the same manner to S1. Hence W5 subclan is completely connected to the same four non-Wenikar subclans as W4: S1, K, F and SW.

S1a is completely connected to all non-Sör subclans except W2. In the case of W2, S1a is tied directly to four of the five W2 lineages. S1b is connected completely to only W3, K and SW, but since it is connected to the one W2 lineage missing for S1a, it can be said that S1 subclan is connected completely to all non-Sör subclans.

S2a is completely connected to W3, K, F and SW, S2b to W3, K and SW, and S2c to W3 and SW. Jointly, S2 subclan is completely connected to W3, K, F and SW.

Ka is completely connected to all subclans except W4 and IN. Kb ties up completely with all but W2 and IN, while Kc is so connected to W1, W3, W5, S1, F, SP and SW. Kd is completely connected only to W3, S1, S2 and SW, with a result that K, as a subclan unit, is completely connected to all other subclans

except IN.

Fa has links of complete connectedness with W1, W2, W3, W5, SP and SW. Similarly, Fb is tied to W1, W3, W5, S2, K, SP and SW. Fc is so connected to W1, W2, W3 and W5, so that merged as one subclan, F lacks complete connectedness only with W4, S1 and IN.

SPa is completely connected to W3, S1, S2, K, F and SW, whereas SPb is so joined only to W3, S2 and SW. SPc's contribution is complete connectedness with W1, W3, W5 and F. Combined, SP subclan has complete connectivity with W1, W3, W5, S1, S2, K, F and SW.

SW is completely connected with W3, W4, W5, S1, S2, K and IN.

IN is completely connected only with SW.

Analysis of the data pertaining to cliques and blocks in table 18 (direct alliances only) reveals that the several lineages of a subclan generally establish mutually reinforcing alliances. Likewise, the various lineages of a subclan often "shun" the same lineages and subclans, establishing no alliances with them. To a lesser extent, this same process appears to be at work among the different subclans of a clan.

All four lineages in W1 subclan are in clique alliance with S1a, and these relationships remain at least unidirectional in a three-bond level digraph (see figure 35). Three of the four W1 lineages are in clique alliances with Ka and with SW, and the relationships with SW stay in (in at least one direction) at a three-bond level. Finally, W1a and W1b both are in cliques with Kb. No W1 lineage is allied directly with SP, nor do direct alliance ties exist with S2a, Kc, Kd, Fa or Fc.

Four of the five W2 lineages are in clique alliance with S1a, and three of the five are similarly allied with S2b. All of the links to S1a remain at least unidirectional at a three-bond level, and two of the cliques are reciprocal

at a five-bond level (see figures 35 and 37). Clique alliances between two of the five W2 lineages and S1b and SW also occur. W2a is in a block alliance with S2a, reinforcing the clique alliance of W2d. No W2 lineage is directly allied with F or IN, nor do any direct links exist with Kc, SPb or SPc.

W3 subclan consists of only one lineage, and therefore, the question of one lineage's alliances reinforcing those of another in the same subclan is inapplicable.

W4 subclan is made up of two lineages. One of these, however, W4b, has the weakest ties of any lineage in the Namoluk alliance system. Remember that W4b constitutes the sole weakening point in figure 32; W4b is the only reason that the entire Namoluk two-bond level alliance system is not C_3. Although W4b does not participate in any cliques, note that its lone direct link to Kb supports the clique alliance between W4a and Kb. W4 subclan is totally without direct ties to F, SW and IN, and no direct alliance connections occur between W4 and S2b, S2c, Ka, SPb or SPc.

The two lineages of W5 subclan both are allied by cliques to S1a in very strong alliances: W5a at a reciprocal five-bond level and W5b at a reciprocal four-bond level. W5 subclan "shuns" direct connectivity with F, SP and IN, and neither W5 lineage is directly allied with S1b, S2c, Kb, Kc or Kd.

Both S1 lineages are in cliques with W1b, W2e, W4a and Ka. The alliances with W1b and W4a remain at least one-way at a three-bond level (see figure 35). S1 completely lacks direct alliance ties with SW and IN, and there are no direct links to W4b, Kd, SPa or SPb.

All three of the S2 lineages are allied with W2a--S2a in a block, and S2b and S2c in cliques. S2a and S2b also have clique alliances with W3 and Fa, and those with W3 stay in at a three-bond level unidirectionally. S2 lineages have no direct alliances with K--the third largest clan on Namoluk--nor with SW or IN.

Direct ties also are missing with W1c, W1d, W2e, W4b, Fc, SPb and SPc.

Three of the four K lineages are allied by cliques with W3, W4a and S1a. Kb's block alliance supports clique alliances between Ka and Kd with W2a. Ka and Kb both maintain clique alliances with W1a and W1b, and Ka also has built up such an alliance with W1d. Unanimously, K lineages have made no alliances with S2, F, SP and IN. Likewise, K lineages are totally unallied with W1c, W2b, W2c, W2d, W2e, W4b and W5a.

All three F lineages are allied by cliques with S1a, and two of them are so allied with W3 and SW.[8] F has not entered into direct alliance with W2, W4, W5, K or IN. In addition, no F lineage is directly allied with W1b, W1c, W1d, S1b, SPb or SPc.

SP is unique in that none of its lineages' alliances prove mutually reinforcing. Nevertheless, SP lineages have supported each other by not directly aligning themselves with W1, W5, K, SW or IN. In like manner, SP lineages have no direct links to W2b, W2c, W2d, W2e, W4b, S1b, S2b, S2c, Fa or Fc.

SW and IN, like W3 subclan, consist of one lineage each and thus the matter of mutual reinforcement of alliances by constituent lineages of a subclan is not relevant in either case.

Moving to a more inclusive level of social organization, let us look at how the different subclans in W and S clans reinforce one another's alliances. Twelve of the fourteen W lineages (4/4 in W1, 4/5 in W2, 1/1 in W3, 1/2 in W4 and 2/2 in W5) are allied by cliques to S1a. One half of the W lineages are bound in similar fashion to SW and six of them are in cliques with S2b and Ka. No W lineage has any direct alliance connection to Fc or SPc, and only one W lineage is directly allied with Fa, SPb and IN. If the single W-F link is ignored (W1a-Fb), four of the five W subclans have no direct alliance with F.

In S clan, four of the five lineages are allied by clique or block with

W2a and three out of five are allied by cliques with W1b, W3, W4a and Fa. Nearly one third of all S cliques and blocks (12/41) are with lineages in W2 subclan. No S lineage has contracted a direct alliance with SW or IN, nor with any of the following lineages: W4b, Kd and SPb.

It is particularly enlightening to observe the alliances made by client lineages in relation to those of their sponsor lineage. It has been explained that client lineages frequently are recruited to bolster the human resources of a subclan to prevent it from dying out or becoming too weak to operate effectively. Another reason for such recruitment seems to be a vested interest in maintaining alliances with other lineages and having enough human resources to do so. The two clique alliances entered into thus far by W1d exactly mirror alliances of its sponsor lineage, W1b. W5a lineage has built up a five-bond reciprocal alliance with S1a, to which its sponsor lineage, W5b, has a four-bond reciprocal alliance. Finally, Kc's three clique alliances all are foreshadowed by previous alliances made by its sponsor, Kb.

E. Comparison and Contrast of the Digraphs

This section will point out some of the general patterns to be found in figures 1-37, after which we shall move on to the conclusions.

Immediately apparent is the fact that every lineage except one--W4b--is in at least one clique. Put another way, all points in figure 32 are carriers, except W4b which is a receiver. In alliance terms, thirty of the thirty-one lineages under study are in at least one strong direct alliance.

There are no four-point cliques or blocks in the digraphs shown in figures 1-32. The maximum number of lineages bound together in total direct alliance is three. Only at the subclan level (figure 33) do four-point cliques emerge, and then there are only two: S1-W3-F-SP and S2-W3-F-SP. These reduce to one (S-W-F-SP) at the clan level (figure 34). All told there are seventy-one

separate two-point cliques, twenty-two different three-point cliques, and six distinct blocks represented in figure 32.

Quite frequently, four lineages are almost bound together in total direct alliance, coming within one missing relationship of being so. Three-fourths of the four-point semicliques (37/50) and two-thirds of the four-point semiblocks (12/19) do not satisfy the criteria for a clique or block as a direct consequence of the rule of clan exogamy. The remainder fail to do so as the outcome of the missing links between S-SW on the one hand and K-F on the other.

On a percentage basis, three-point semicliques and three-point semiblocks are less commonly a result of clan exogamy than their four-point counterparts. Less than one half of the three-point semicliques are a direct consequence of exogamy rules (181/392), and just over one half of the three-point semiblocks are a result of this (82/151). Adherence to restrictions against intraclan marriage account for only 48 percent of the three-point semicliques and three-point semiblocks. The other 52 percent of the cases are spread over a broad spectrum of "missing links," with no single "missing link" accounting for more than 6 percent of the total.

S1a lineage is unquestionably the keystone of the Namoluk alliance system. This is evident in several ways. First, S1a is a member of nineteen of the seventy-one two-point cliques and fifteen of the twenty-two three-point cliques. Its closest rival in either category is W3, which is present in ten of the seventy-one two-point cliques and nine of the twenty-two three-point cliques. S1a's dominant position in respect to clique alliances automatically gives it an equally towering spot in semiclique alliances. Second, S1a is both the incenter and the outcenter of figure 32 (its associated number pair is 2,2). S1a is the "sun" about which other "lesser" lineages revolve. Third, the primary zone digraphs for three other lineages are wholly contained in S1a's primary zone

digraph (figure 15). These include W1d (figure 4), Kc (figure 22) and SPc (figure 29). Of the twenty-seven remaining Namoluk lineages, only three others have their primary zone digraphs completely subsumed within the primary zone digraph of another lineage. These are IN (figure 31) contained in W1c (figure 3), Fa (figure 24) contained in W3 (figure 10), and W4b (figure 12) nestled into Kb (figure 21). Finally, S1a has the greatest number of five-bond and four-bond alliances of any lineage. Where S1a enjoys four five-bond reciprocal alliances (see figure 37), no other lineage participates in more than one reciprocal and one one-way five-bond alliance. Echoing this, S1a has three reciprocal and one unidirectional four-bond alliance, while no other lineage entertains more than one reciprocal and three unidirectional four-bond links.

Kb occurs as a member of five of the six unique blocks, and four of the blocks directly result from the tenuous one-way two-bond tie from Kb to SW.

There are sixteen weakening points in the digraphs in figures 1-31, and of these, seven are lineages in S2 subclan. This datum demonstrates that S2 has been very strongly ensconced in the alliance system, but now, faced with diminishing human resources, is unable to maintain its alliances in proper fashion. Of the three S2 lineages, one is extinct (S2c), one will become so when its two surviving members die (S2b), and the third has only six members--four of whom are adults (S2a). S2 recruited a client lineage from Lukunor three generations ago, but this effort did not produce the desired increase in subclan population. The woman who was recruited gave birth to a total of four children (two of whom were daughters), but one daughter proved sterile and one produced only a son. Since S2 lineages have been integral to the Namoluk alliance system right up to a five-bond level, some other subclan or clan will have to replace them as they fade away. The likely successor appears to be K subclan, in view of its rapid growth in human resources, and in keeping with

its alliances with many of the same lineages as S2.

Taken as primary zones, one half (15/31) of the Namoluk lineages are C_3, and more than 80 percent (26/31) are C_2 or C_3. Only five lineages are C_1, and none is C_0. In other words, no Namoluk lineage is wholly without alliances, and well over three-fourths of the lineages are solidly connected (C_2 or greater) to all the lineages with which they have direct links.

Figures 35, 36, and 37 give an idea of which subclans and clans are most integral and which are most peripheral to the alliance system. At a three-bond level, every subclan is still represented. At a four-bond level, only one subclan--IN--fails to appear. At a five-bond level, every subclan is to be found except IN, F and W4.

Having analyzed the digraph data in some detail, we are now in a position to move on to the conclusions.

VII. CONCLUSIONS

...I have sought to demonstrate that the notion of 'structural relationship' is not merely an abstraction which the anthropologist uses as a paradigm to simplify his problems of description. The social structure which I talk about in this book is, in principle, a statistical notion;....It is a by-product of the sum of many individual human actions, of which the participants are neither wholly conscious nor wholly unaware (Leach 1961b:300).

In the conclusion to Pul Eliya, Edmund Leach makes the above statement about the nature of social structure. His argument for a "statistical" view of social structure is aimed at the followers of Radcliffe-Brown who hold that "customs" or "jural rules" are the proper focus for social structural analyses. Leach's cogently argued book brought into the open what Howard (1963:407) has called the fundamental issue in social anthropology today, namely whether it is best to analyze social systems by "statistical" models or by "mechanical" models? The body of this dissertation bears directly on this and related issues, and it is now time to confront these questions one by one.

I have selected and identified three kinds of behavioral transactions (five measures) from among a wide array of possible behaviors on Namoluk Atoll. Using these transactions, I have abstracted a system of relationships among descent group units on the island, and I have constructed a representational model based on the theory of directed graphs to show how the five transactions co-occur. This model shows that the system of relationships among descent groups under investigation is nonrandom, i.e., that there is regularity or orderliness in the system. Furthermore, the model clearly shows that the system exhibits a limited range of pattern isomorphism, such that the occurrence of one transaction "predicts" that others will occur. A detailed discussion of the regularities and discontinuities in the data, based on comparison and contrast of

structural features, was presented in the preceding chapter. It remains to make some generalizations about the revealed system, and to relate these to some broader theoretical debates in the study of kinship and social organization.

In facing up to the fundamental issue of choosing between a "statistical" model of social structure on the one hand or a "mechanical" model of social structure on the other, Howard (1963:408) maintains that these are not the only options available to anthropologists. He argues that "decision-making models," focused on "activity systems" rather than social structure writ large, offer a viable and valid alternative. Ideally, as conceived by Howard, decision-making models should permit us to predict choices made among behavioral alternatives. Such prediction is in keeping with Goodenough's (1957) dictum that an ideal ethnographic description should provide us with the information necessary for an outsider to know how to act in a culturally appropriate manner under a given situation. A decision-making model should provide us with a "grammar" for social behavior in the culture being studied (see also Burling 1969).

It must be apparent that the model I have presented in this dissertation is not a decision-making model as this has been developed by Howard (1963), Keesing (1967, 1970), Monberg (1970), and others. My model is not determinate, nor as it stands, is it specifically predictive of future behavioral outcomes. Nevertheless, the model as presented does provide a "grammar" of alliance formation and intergroup solidarity on Namoluk, in the sense that Burling (1969: 818-19) discusses "ethnographic grammars." As I shall show below, the model I have presented includes a set of rules that "predict" how alliances are begun and maintained on Namoluk, but it does not predict what specific new alliances may occur at some point in the future. If the model presented is not a decision-making model, then, what kind of model is it?

In spite of the obvious utility of treating jural rules ("mechanical" models) and statistical norms ("statistical" models) as separate frames of reference for many problems in social anthropology (Leach 1961b:9), we must never lose track of the fact that this is only an analytical distinction. As such, we may discover that in investigating certain kinds of problems, it is no longer useful or necessary to maintain this distinction. There is nothing inherent in empirical data that dictates separation of normative from normal. In similar fashion, the useful analytical distinction we make between emic ("conscious" models) and etic ("unconscious" models) does not mean that the twain can never meet. The model I have built to represent Namoluk behavioral transactions in marriage, land, and adoption is at once "mechanical," "statistical," "emic," and "etic." Does such a claim imply that I am trying to make a model that will be all things to all anthropologists? Is it merely an analytical smorgasborg or is there something to be gained from combining these different analytical frames into one model?

In building my model, I took Namoluk emic categories and ideal rules of what should occur in marriage, adoption, and land transactions as my starting point. From this "emic" and "mechanical" perspective, I discovered that, for Namoluk people, the relevant units having jural rights in such transactions were units organized on the basis of common descent: lineage, subclan, clan, and the descendants of the men of each of these. Therefore, I resolved to examine how these kinship units were linked together through time by transactions in people and in property. This led me to investigate what sorts of behaviors, decisions, vested interests, conflicts, and so on were involved in Namoluk land transmission, marriage, and adoption, again primarily from an "emic" and jural standpoint. Once I had obtained some insight into how the system is supposed to work from a Namoluk point of view, I then switched the

set of lenses through which I had been looking and began to gather "statistical" data on how the system "really" works. Finally, employing an etic, content-free analytical tool (directed graphs), I sought to summarize in as precise and concise a way as possible the statistical frequency of actual transactions among emically defined social units that would "predict" how these transactions reinforce each other.

It seems to me that what I have done has been done before by many other anthropologists. The process of fieldwork consists, in varying degrees, of attempting "to grasp the natives' point of view," and then to make this point of view intelligible to members of one's own culture. Thus nearly every ethnographer must grapple with the problem of translation. What I am arguing is that, in our very role as cultural translators, we cannot avoid "mixing" the natives' viewpoint with our own. In order to be able to translate, we must first understand what it is we wish to translate. Once we gain that understanding--that different point of view--it becomes a part of our own perspective. Thus a model that explicitly combines emic and etic frameworks of analysis, as mine does, is really as old as fieldwork itself. I am only attempting to make explicit what has always been present implicitly, and to point out the limits on the usefulness of maintaining important dichotomies such as emic/etic or normative/normal.

I suspect that here I am substantially in agreement with Howard (1963) in maintaining that there are alternatives in anthropology to viewing social structural models as <u>either</u> "statistical" <u>or</u> "mechanical." But where Howard opts for a specifically predictive alternative model, I am arguing that we can combine the "statistical" and "mechanical" viewpoints in one model, for certain purposes, and focus on the agreement or lack of agreement between them (see, e.g., Marshall n.d. b). Whether or not this turns out to be "predictive" does not affect its

explanatory value.

In discussing the different types of formal models in use in the social sciences, Berger et al. (1962) propose three major categories into which they feel such models can be fit. The model I have developed is what Berger et al. call a "representational" model. Representational models are attempts to arrive at precise and formally simple descriptions of a recurrent phenomenon, usually within the constraints of a few explicitly stated assumptions. As these authors go on to state, one major feature of a representational model "...is that it enables us to exhibit and systematically study the relations of various aspects of the...process to one another" (1962:62). That representational models share much in common with descriptive grammars in linguistics should be apparent (Burling 1969).

My basic premise is that we want a model that will reflect accurately the system under study as a "mechanical" model; (one that expresses "...the interconnexions and implications of rules or ideal types..." (Barnes 1971:129), and simultaneously will summarize in a concise fashion what actually occurs in the system (a "statistical" model). From this, we can then deduce a set of abstract rules that explain, account for, or "predict" (in a general sense) both the system as it should be and the system as it is. Such a model has been presented at some length in chapter 6. The task remaining now is to set forth the rules that govern this system, i.e., to specify "how the system really works."

Levi-Strauss (1963:271-72) holds that any model of a social structure should be transformable into a series of models of the same type which make it possible to predict how the model will react if one or more of its elements are modified. One such series of transformations has been given in figures 32-37. These digraphs demonstrate the occurrence of a number of regular

modifications. First, as the more inclusive descent groups of subclan and clan are substituted in place of lineages, connectivity among units in the digraphs increases from C_2 to C_3. Since it has been stressed already that thirty of the thirty-one lineages are strongly connected to each other (i.e., that figure 32 has only one weakening point), this comes as no surprise. Second, the transformations on the basic model in figure 32 that are obtained when weaker interlineage bonds are successively deleted (figures 35-37) show connectivity and the number of structural components to decrease steadily. At a two-bond level, the connectivity of Namoluk lineages is C_2. Elimination of all two-bond relationships results in a digraph that is C_1 (figure 35), and connectivity remains C_1 when all three-bond lines are eradicated (figure 36). Finally, at a five-bond level, the digraph representing Namoluk interlineage alliance becomes C_0. Paralleling this decrease in connectivity, the number of structural components at progressively higher levels of bonding also plummets. From seventy-one two-point cliques and twenty-two three-point cliques at a two-bond level, the number of structural components drop to twenty-six two-point cliques and five three-point cliques at a three-bond level. By the time a four-bond level is reached, three-point cliques are no longer present and only fourteen two-point cliques remain. The number of two-point cliques still contained in a five-bond level digraph is only five. These facts taken together support the following generalizations: (1) as the level of descent group inclusiveness is increased from lineage to subclan to clan, the strength of connectivity of that unit with equivalent units increases; (2) the strength of connectivity of a digraph representing interlineage alliance varies inversely with the strength of the bond (two-bonds, three-bonds, etc.) linking lineages to one another. As weaker bonds are eliminated, leaving only stronger bonds in the digraph, the connectivity of the digraph progressively weakens.

These observations lead logically to some general insights about social

structure and social solidarity on Namoluk. There are a great many more "weak" alliances than "strong" ones in terms of the degree of bonding that exists. This is partially, but not entirely, a matter of size. Unless a lineage is fairly large, it simply does not have the human resources necessary to build up "strong" (four-bond or five-bond) alliances with any frequency. Along with this is a general strategy of avoiding "putting all your eggs in one basket." Lineages that are in single clique alliances (Fc, SPb, SPc, IN), or in no clique alliances (W4b), are few in number and are either extinct or on the verge of becoming so.[3] The ideal alliance pattern for any given lineage at any point in time as revealed by the etic analysis presented in chapter 6, is to have one or more reciprocal four or five-bond alliance, coupled with several reciprocal two or three-bond alliances.

All twenty-five lineages actually existing and represented on the atoll in 1971 are C_3, as are all Namoluk subclans and clans. Therefore, the structural connectivity of the Namoluk alliance system is, for practical purposes, C_3. Since structural solidarity has been defined operationally as a matter of structural connectivity, it is fair to assert that Namoluk society is characterized by a high degree of social structural solidarity. Namoluk social structure is strongly connected. This structural solidarity means that the whole--Namoluk society--relies for its solidarity on the interdependence of the kinship units that make it up.

The particular alliance combinations chronicled in chapter 6 represent only those alliances that have been made during a particular slice of history (approximately 100 years). It is entirely likely that other alliance combinations occurred in the more distant past for which no data are available, and it is equally probable that new combinations will come about in the future. It is, of course, the patterns of alliance that exist in the historical period under

investigation that contain the information we have to work with. And what is informative here is the uneven distribution of relations--the deviation from uniformity. What prevents all descent groups from having equal transactions with each other? What rules seem to account for the formation and maintenance of the transactional alliances represented in the digraphs?

The basic rules governing the formation of such alliances seem to be those governing the preferential marriage system. The initial marriage that may lead to the establishment of an enduring alliance between two descent groups may be happenstance or statistically random. It is how these initial marriages affect later marriages between the two descent units that explains how what begins as happenstance continues by conscious design.

It has been mentioned in chapter 4 that Namoluk people express as an ideal cultural rule that cross-cousin marriages, sibling-set marriages, and sororal and leviritic marriages are desirable and to be contracted whenever possible. Tables 7, 8 and 9 have provided statistical information to show that such marriages are not merely normative ideals, but that they comprise a statistical majority of marriages on the atoll as well. Given an initial marriage, in combination with the ideal and statistical facts of cross-cousin marriage, sibling-set marriage, and sororal and leviritic marriage, it is not difficult to see how marriage alliances lasting for several generations become established between two descent units.

Should the initial marriage result in children, considerable effort will be made to arrange the marriage of one or more of these children with a cross-cousin. If it is a son who is involved in a cross-cousin marriage, his father's kin will work very hard to marry him to a woman of their descent group to 'get back' the land given him by his father in inheritance. When the son has children of his own to whom he passes land in inheritance, the land transactions

between the two descent groups ideally will be momentarily balanced. Alternatively, if it is a daughter who is involved in a cross-cousin marriage, members of her own descent group will pressure her to marry one of her mother's brother's sons. In this way, land that has passed out of their hands will return to them in the next generation.

It should be clear that such a system cannot work indefinitely if only women or only men are circulated by a descent group in cross-cousin marriage. If members of only one sex were to marry into another descent unit through several generations, one unit would only transmit land and the other would only receive land. Since no descent group can afford to give away land indefinitely with no expectation of return, the oft-repeated Namoluk desire to have children of both sexes takes on a new light. With both sons and daughters, the ability of a descent group to maintain alliances and to maintain its own best interests in respect to land is assured.

For the above reason, I believe Levi-Strauss's stress on the circulation of women alone to be misleading. A basic tenet of Levi-Strauss's view of marriage alliance is that women are circulated between groups of men, setting up a cycle of reciprocity linking several groups together (Barnes 1971:151). In a discussion of Crow and Omaha kinship systems, Levi-Strauss notes that no satisfactory interpretation of their rules of marriage has been forthcoming. Still, he goes on to argue that:

> ...to explain these and other sets of rules...one will have to proceed as we have shown here, namely, to interpret kinship systems and marriage rules as embodying the rule of that very special kind of game which consists, for consanguineous groups of men, in exchanging women among themselves...(1960:283).

On the basis of the Namoluk evidence, I submit that one reason why Crow and Omaha marriage systems have proved difficult to explain is that we have been wearing a set of ethnocentric blinders. We have assumed, a bit naively perhaps,

that it is always women who are circulated in marriage by groups of men. Not only does this smack of male chauvism (which we have recently come to realize lurks even among "culturally emancipated" anthropologists!), but it has also been a red herring. The "Crow" system of marriage alliance on Namoluk becomes comprehensible, not when we try to fit it into our preconceived notion that women get circulated by men, but rather when we observe that both men and women get circulated in marriage by descent groups made up of members of both sexes, all of whom have a voice in such arrangements. In fact, contrary to the mythology that men are the major decision-makers in arranged marriages, the Namoluk data indicate that, if either sex plays a greater role in such decisions, it is women and not men who do so.

In fairness to Levi-Strauss, it must be noted that he anticipated such a situation, although he did not incorporate it into his own analytical scheme. In a paper published eleven years after Les structures, Levi-Strauss had this to say:

> The female reader, who may be shocked to see womankind treated as a commodity submitted to transactions between male operators, can easily find comfort in the assurance that the rules of the game would remain unchanged should it be decided to consider the men as being exchanged by womens' groups....And both sexes can be comforted from a still different (but in that case slightly more complicated) formulation of the game, whereby it would be said that consanguineous groups consisting of both men and women are engaged in exchanging together bonds of relationships (1960:284).

This latter situation is, in fact, exactly what obtains on Namoluk.

The preference for sibling-set marriage affects marriage alliances on Namoluk in a somewhat different way than cross-cousin marriage. In a fashion identical to what Zelditch (1959:472) has documented for the Ramah Navaho, an initial marriage by an elder sibling "binds" by preferences his younger siblings for marrying into the same descent group into which he has already married. Zelditch shows that sibling-set marriage, by itself, does not lead

necessarily to the continuity of an alliance system over two or more generations. But unlike the Ramah Navaho, Namoluk people prefer sibling-set marriage in combination with, rather than exclusive from, cross-cousin marriage. Thus, if an elder sibling on Namoluk marries a cross-cousin, his younger siblings may decide to marry into the same descent group, in which case they will have satisfied the preferences for both cross-cousin and sibling-set marriage. As has been discussed above (chapter 4), such situations are common on Namoluk.

Even assuming that an initial set of sibling-set marriages on Namoluk are not also cross-cousin marriages, we know from the discussion of cross-cousin marriage above that pressures will be brought to bear on the children of these non-cross-cousin, sibling-set marriages to marry their own cross-cousins. Thus, in the end, a marriage alliance of two or more generations is likely to develop.

Sororal and leviritic marriages act to maintain preestablished marriage alliances when death (or sometimes divorce) intervenes. The preference for this sort of marriage is an effort by members of the two descent groups concerned to keep a mutually beneficial arrangement in operation as long as possible.

It seems evident that the core of the transactional alliance system mapped out for Namoluk in the digraphs is the preferential system of marriage. But the digraphs show that transactions in land, marriage and adoption co-occur. How can we be certain that marriage transactions precede transactions in land and adoption in most cases?

In an earlier chapter (chapter 5), it was pointed out that at minimum, 82.5 percent of Namoluk land transactions are directly contingent on marriage, a threat to marriage, or the dissolution of a marriage. I have also documented elsewhere (Marshall n.d. c:table 1) that 97 percent of all adoptions on Namoluk occur with an adoptee's matrilineal or patrilateral kin. These statistics,

taken together, indicate that once men and women have circulated between two descent groups via transactions in marriage, the likelihood is very great that transactions in land and adoption will follow. All of these transactions reinforce each other and help cement the alliance. Given the vested interests that arise for all parties to such an alliance, the alliance usually is maintained as long as demographic constraints permit.

The voiced preferences by Namoluk informants to marry on the atoll, rather than to seek an extra-island spouse, now become understandable in terms of the vested property interests that all Namoluk people have in the alliances to which their descent groups are committed. Off-island marriages are not encouraged because the likelihood of reciprocity that is essential to the maintenance of Namoluk social organization is low. Ideally, marriages are engineered so as to maximize the potential for reciprocity. One good exchange deserves another! It is this quest to maximize reciprocity that provides the fuel to keep the Namoluk alliance system operating as an essentially closed system. Caughey (1970) has shown a similar tendency for what he calls "district endogamy" and interlineage alliance to be at work on Uman, Truk. A like preference for marriage within the localized territorial group is mentioned by Biggs (1960) in his treatment of Maori marriage. Hence the rule of thumb seems to be "marry out or die out, but don't marry too far out," and it appears that this rule has general application throughout Oceania. In addition, Leach (1961:303) advances a similar argument in support of "local group endogamy" in Pul Eliya.

Thus the nonrandomness of the Namoluk system of transactional alliances under discussion rests ultimately on the limiting conditions of preferential marriages on the one hand, and the requirement for descent group exogamy on the other.

As Levi-Strauss (1949) has shown, exogamy restrictions lead to an exchange

of men and women between descent groups as a counterpoint to sharing within descent groups. In ways we have just seen, exchange of men and women in marriage leads to exchanges of land and exchanges of children by adoption. The notion of unity of the descent group based on sharing within and unity of the entire social structure based on exchange among descent groups is fundamental to a comprehension of the working of Namoluk society. Moreover, this underlying organizational and symbolic premise appears to be a general one throughout Oceanic and New Guinea societies. Once again, therefore, we are brought back to a basic argument of this study: that exchange is at the bottom of both alliance and social structural solidarity. Let us investigate this argument further.

In a discussion of the principle of reciprocity, Levi-Strauss mentions Polynesian ceremonial exchanges

> ...in which goods must as much as possible not be exchanged within the group...but must go to other groups and into other villages. To fail at this duty is called sori tana 'to eat from one's own basket'... convention demands that neither of the two local groups consume the food which they have brought but that they exchange their provisions and that each eat the food of the other (1964:40).[1]

Just as Polynesians are enjoined from 'eating from their own baskets' in certain ceremonial contexts, Hooper (n.d.) has shown recently that they are also enjoined from 'eating their own blood'--committing incest or incest-like behaviors with their own relatives. This same phenomenon, where sexual intercourse or marriage within a descent unit is likened to self-consumption and self-destruction, has been chronicled by Labby (n.d.) for Yap, where incest is viewed as a form of "cannibalism." In the same volume, Lieber (n.d.) has shown that rules of incest serve to define the boundaries between different categories of social persons.

On Namoluk, rules of clan exogamy require the exchange of men and women among different descent groups through marriage. To marry within the same clan is to behave in a self-destructive manner, without regard for one's own interests

or those of one's kinship unit. Even worse than this, such a marriage confuses boundaries between the constituent units that make up Namoluk society and thus threatens the very organizational structure of the whole. Symbolically, the pattern "share within--exchange without" is basic to maintaining Namoluk social structure through its demarcation and reaffirmation of the boundaries that distinguish the constituent structural units.

Regular exchange of human resources between descent groups in marriage leads to regular exchange of land resources via inheritance and other avenues of land transmission. Furthermore, the preferential marriage system turns out to be an especially convenient and suitable vehicle for establishing and maintaining close exchange relations between two or more descent groups. Regular exchange of spouses through cross-cousin marriage is one simple and clearcut way for keeping an exchange between two descent groups going.

Writing about the South Fore people in New Guinea, Glasse (1969:36) makes the same point: "I suggest that the so-called 'preference [for cross-cousin marriage] is no more than the expectation of marriage arising in a reciprocal relationship entailing long-term property exchanges in both directions." The Namoluk data support this contention. In regard to another Highland New Guinea society, Wagner (1969:58) states explicitly that "Daribi define clan membership in terms of exchange symbolism, members of a clan are those who 'share wealth' or 'share meat' together, nonclan members are those with whom one exchanges wealth or meat." It has been shown that on Namoluk members of 'one flesh and blood' share physical substance and usually share land. Alliances with other descent groups lead to an exchange of 'flesh and blood' and an exchange of land in a manner quite analogous to the Daribi conception. Namoluk kinship units can only survive and maintain themselves physically through time by exchange.

From all of this, a picture emerges in which the two most valued resources--land and people--are "shared within--exchanged without" in certain prescribed ways. Shared 'flesh and blood' and shared land, reinforced by shared residence, work, material possessions, food, political cause, children (viaadoption and fosterage), and strong feelings of sentimental attachment (tong) define empirically and symbolically membership in a Namoluk descent unit. Simultaneously, however, exchange of 'flesh and blood'[2] and exchange of land, reinforced by exchange of residence, work, material possessions, food, political support, children, and lesser but still significant feelings of sentimental attachment define empirically and symbolically the essence of intergroup alliance. The raw materials for intragroup solidarity and intergroup solidarity are the same--most importantly, land and people. How these raw materials are used symbolically and actually--the spirit of the enterprise--is what differentiates "shared within--exchanged without." Although exchange occurs between units at one level, these units are all part of a coherent system at a higher level of abstraction. Hence exchange transactions at the level of descent groups promote and maintain the social structural solidarity of the entire atoll community.

I must make clear that the entire thrust of this dissertation has been away from invoking "solidarity," as a mystical "ultimate explanatory device," of which Leach (1961:298) accuses the British structuralists. We are engaged in demystification. I have claimed that, for operational purposes, social structural solidarity on Namoluk consists in the co-occurrence of any combination of two or more of the five varieties of transactions in kinship and land (any line in the digraphs). As the number of sorts of transactions that co-occur in a given instance increases from two through five, social structural solidarity between the two descent groups so linked is said to increase.

Social solidarity rests on the twin pillars of mutual interdependence born

of exchange and reciprocity on the one hand, and shared particularistic values on the other.[3] One cannot exist without the other. When either pillar is removed, the solidarity of the structure is destroyed and it may fall apart. Therefore, there appear to be two avenues of approach to an investigation of social solidarity. The first is via a thorough, in-depth analysis of particularistic social values. The second, a road more commonly traveled by social anthropologists, is the one taken here, which is an equally thorough, in-depth analysis of social structure. Combining such an investigation of social structure with the theory of directed graphs permits us to determine precisely the actual strength of connectivity that exists among the constituent units of social structure, be they groups, quasi-groups or individual persons. From this it is possible to state whether the society under study (1) is strongly connected internally and exhibits a high degree of social structural solidarity, (2) is unilaterally connected internally and reveals a moderate amount of social structural solidarity, (3) is weakly connected internally and shows a low degree of social structural solidarity, or (4) is disconnected internally and exhibits no social structural solidarity.

Using undirected graphs combined with the theory of structural balance and game theory, Hallpike (1970) recently has published a most stimulating paper on alliances among Konso towns. His analysis reveals a number of intriguing structural similarities to the analysis conducted here for Namoluk descent group alliances. Dealing with a corpus of thirty-six towns (versus the thirty-one Namoluk lineages), Hallpike found that the greatest number of towns bound together in what he calls"balanced nuclear alliances" was four, and there was only one such four-town alliance. Allowing for the differences between undirected and directed graphs, Hallpike's "balanced nuclear alliance" comes closest to what is called a clique in this dissertation. When clique and

"balanced nuclear alliance" are thus equated, a particularly striking similarity emerges between Konso and Namoluk alliances. Hallpike's model predicts that 75 percent of all Konso alliances will be between two members, with the remaining 25 percent among three members. In reality, 75 percent of Konso alliances are between two members, with the remaining one quarter equally split between three and four member alliances. In the model for Namoluk alliance, 76 percent of the cliques consist of two members, 24 percent of three members, and there are no four-point cliques. These nearly identical findings from two widely separated cultures and analyses suggest a single underlying principle of alliance formation may be at work. It would appear that the greater the number of units linked in direct reciprocal alliance, the more difficult it is to sustain that alliance. As a corollary to this, it seems that complete symmetrical alliances involving four or more members are extremely unlikely to exist. These ideas fit in with Levi-Strauss's notion that direct "restricted" exchange is impossible to maintain in large complex societies with a large number of interchanging groups.

The fact that representational models are not tied to any specific theory gives rise to the possibility that a representational model developed with one purpose in mind may shed light unexpectedly on a completely different question (Berger et al. 1962:59). This seems to be the case with the revelation in the analysis that structural components of the Namoluk alliance system occur only in combinations of two, three and four descent groups. This fact seems to reflect other more general themes in Carolinian atoll culture. In a monograph impressive for its attention to detail, Alkire (1970) has documented the recurrence of dualistic thinking, symbols, and organizational premises in aspect after aspect of west-central Carolinian society.[4] In systems of counting, construction, navigation, divination, curative techniques, astronomy, political organization, village organization, and measurement of length, time, anatomy and distance, dualism appears again and again.[5] Namoluk structural

alliances formed of two-point cliques, four-point semicliques and four-point semiblocks, as revealed in the research reported here, seem to fit in readily with the Carolinian stress on dualism to which Alkire has drawn our attention. While cliques, semicliques and semiblocks of three points do not seem to conform outwardly to a dualistic scheme, Alkire (1970:70) shows that triads fit into the Carolinian conceptual system in a fashion quite similar to the "triadic dualism" of Hegel. Thus the structural analysis presented here in one context lends unanticipated support to a general cultural theme that has been revealed through other methods of analysis by a different worker in another context.

Having said all of this, a number of interesting possibilities remain for further research in this area. The richness of ideas and theorems available in graph theory has barely been tapped in this analysis. In dealing with the model as a formal construct that can be manipulated by mathematical methods (Cf., Nutini 1965:720), digraph theorems pertaining to the removal of a line or a point might be applied to the model (see, e.g., Harary, Norman and Cartwright 1965:chapters 7 and 8). In this way, it might be possible to produce a set of transformations on the model that will provide clues to changing alliance patterns and the implications of such changes for social structural solidarity.

In a different direction, a cultural analysis of shared particularistic values on Namoluk, similar to Caughey's study of values on Uman, Truk (1970), would be useful. Such an investigation should provide important additional information about "solidarity" from a quite different perspective than that offered here.

By employing digraphs to represent the Namoluk alliance process, a number of gains have been made over a nonmathematical verbal exposition. First, it has proved easier to manipulate points and lines in a formal system than to wrestle with actual situations and entities. Second, the representation of alliance by digraphs makes it simpler and clearer to show the logical internal

consistency of the concrete system itself. Third, formulation of the data in terms of directed graphs and their connectedness properties has helped create new hypotheses about Namoluk social structure specifically, and about social structure and social solidarity generally. Fourth, the digraphs have allowed rigorous and unconfusing treatment of the regularities of pattern among a set of basic variables, illustrating to what extent and with what frequency these variables co-occur. Finally, the digraph model serves as a useful backdrop against which to suggest the inappropriateness of old concepts (e.g., descent theory versus alliance theory), and to suggest new alternatives (a logical, nonconflicting merger of descent and alliance as a better way for handling kinship and social structure).

For some years now, descent and alliance have been treated as opposite or mutually exclusive ways for viewing social structure, and a great deal of ink has been spilled in efforts to assert the superiority of one mode of analysis over the other. In reviewing a recent volume on New Guinea marriage systems, Schwimmer issues a call for a new theoretical approach "...in which the principle of reciprocity is given the full status of a structural principle alongside the ideology of descent" (1971:719). Schwimmer goes on to lament that while Glasse and Meggitts' (1969) volume suggests the value of such a theoretical approach, it never actually uses that approach. The analysis offered in this dissertation does not pretend to be a theoretical treatise. Nevertheless, it does merge the principle of reciprocity with the ideology of descent, and in so doing, it takes at least the first steps toward a theoretical rapprochment between descent theory and alliance theory.

CHAPTER I. THE PROBLEM

1. For an interesting recent attempt to employ set theory in anthropology, see D'Souza (1972).

2. The use of graph theory was foreshadowed in social psychology by Lewin's use of general topology, and by Moreno's development of the sociogram (see Barnes (1969) for an extensive treatment of this matter).

3. The mathematical theory of graphs traces roots to Euler's seminal paper of 1736, although the first comprehensive treatment of this subject had to await König (1936) in his Theorie der endlichen und unendlichen Graphen. More recently, graph theory has received intensive treatment by Berge (1962), Ore (1962), Flament (1963), Coleman (1964), Harary, Norman and Cartwright (1965), Busacker and Saaty (1965) and Doreian (1970). Of these works, Harary, Norman and Cartwrights' book is by far the most helpful to a social scientist seeking to apply graph theory to his data.

4. There is some evidence to indicate that in the past nearly all extra-island transactions of the types to be investigated here conformed to the rules governing the intra-island system. There is equally convincing evidence that many extra-island transactions occurring within the past twenty-five years (specifically, those occurring between Namoluk and islands in Truk Lagoon) conform to the canons of another system. In this other system, location (village or island district) is substituted in place of clan membership. The essential point here is that a transformation in basic rules for extra-island transactions seems to be taking place under the exigencies of new circumstances and opportunities. These include increased education for a greater number of people, better transportation and communication facilities, and more opportunities for wage employment.

5. "Greater Trukese society" refers to all of the islands and people of Truk District in the U.S. Trust Territory of the Pacific Islands (Micronesia).

CHAPTER II. BACKGROUND

1. Traditional history holds that Namoluk was repopulated from Etal following the death of the entire Namoluk population as a result of black magic worked on them by people in Truk Lagoon. A figure of speech frequently used to express this relationship is, "Etal is the canoe, Namoluk is the outrigger."

2. Girschner (1912) doubtless is correct when he says only Nama and Losap were included in Lukeisel; use of the term today, however, includes Namoluk.

3. Goodenough (1966:100) provides the following meanings for nomwo: 'bounded body of water, lagoon, bay, sound, sea, territorial waters, archipelago'. As used on Namoluk, le nom refers specifically to a lagoon.

4. Girschner (1912) claims that Namoluk is the European name and Nomoilam is the native term for the atoll. This is likely since Namoluk is also the name for one of the islets: early visitors from Europe or America may have put ashore and asked the name of the place only to be given the name of the islet they were on. On the other hand, it may be significant that the first ethnologist to work in the Mortlocks does not mention Nomoilam at all, making reference instead only to Namoluk (Kubary 1880).

5. Chä was never a separate islet at all, but rather a sandbar covered with scrub and connected to the northwest end of Töinom. At high tide this sandbar was "separated" from Töinom by a shallow channel of water; at low tide it was "joined" to Töinom and a small salt water pool is all that remained between them. Informants recall this pool as being a very effective natural fish trap.

6. Keeping dogs seems to be a cyclical thing on Namoluk. Girschner (1912) reports that there were no dogs present at the time of his visit, but that dogs had been there previously and had been exterminated.

7. Lukan islet has no rats. This fact was established by setting a trap line there with no catch, and by information from Namoluk people who have never found evidence of rats there. Umap islet has only R. rattus. For more details on this study, see Wallace, Marshall and Marshall (n.d.).

8. LeBar (1964:65) notes that fruit bats are fed, named, and kept as pets on Truk.

9. Beginning in the early 1940s, pigs were allowed to roam freely on Amwes, where they all had been taken from Namoluk. Their numbers increased to between 300 and 400 (more than the human population of the atoll at the time!), and Namoluk achieved local fame as an exporter of pigs to other islands in the Mortlocks. Nearly all of these animals perished in the 1958 typhoon and the atoll's pig population (now exclusively on Namoluk islet) has not yet reached more than forty.

10. Namoluk lizards were collected and deposited with the Bernice P. Bishop Museum in Honolulu. Identifications of the specimens have been made by Dr. Richard G. Zweifel of the American Museum of Natural History in New York. The monitor, Varanus, which occurs on Etal and elsewhere in the Lower Mortlocks does not live on Namoluk.

11. A sizable collection of insects was made on Namoluk and has been deposited at the Bernice P. Bishop Museum in Honolulu. As of this writing, identifications for these specimens are not available.

12. Herbarium collections from Namoluk were made for the Bernice P. Bishop Museum in Honolulu and for the Smithsonian Institution in Washington, D.C. Data on Namoluk plants presently are being prepared for publication in the Atoll Research Bulletin by the author and Dr. F. R. Fosberg of the Smithsonian.

13. Gourou (1965:207) correctly observes that some atolls with high population densities (among which he includes Namoluk) are not really overpopulated because the people rely on the sea for much of their livelihood.

14. Long before foreign intrusion, Namoluk maintained contact by canoe with islands as far away as Nukuoro and Puluwat (Riesenberg 1965:158). Open ocean canoe voyaging today is rapidly becoming a lost art and nothing like the keen desire to learn the ways of a navigator described by Gladwin (1970) for Puluwat is to be found on Namoluk. The last canoe voyage from Namoluk to Truk was more than fifty years ago and no Namoluk canoe has sailed to the Upper Mortlocks since a canoe was lost on such a trip in 1950. The last canoe voyages to the Lowers as of this writing were made to Etal in the spring and summer of 1969.

15. To cite but one example of how such statistics may be misleading, Namoluk's population density per square mile, calculated on the basis of TLP, is 1158 per square mile; calculated on the basis of the TRP it is 843 per square mile.

16. Lütke's own words beautifully convey the flavor of his stopover at Namoluk and for this reason they are reproduced here in toto (Lütke 1835:88-91; my translation):

> ...at the crack of dawn we headed to the northwest, in which direction from information collected on Lukunor, we expected to encounter the Namoluk group. We traveled to the northeast of the Etal group, when the islands that we were searching for appeared right in front of us. We sailed completely around this small group, which is not more than six miles in circumference, and which is composed of four islets. We then hove to in order to receive visitors who were already coming toward us in their canoes. We planned to lay over until noon, devoting two hours of our time to visiting with them. They are not in any way different from the people of Lukunor.... All of them asked to come aboard to explore the ship; none of them undertook on his own to go anywhere without permission, even less to touch anything. We could but find them very nice people, even after having seen the people of Lukunor. One jovial looking man, whose name was Lougoun, surpassed everyone else in the inexhaustible activity of his tongue and body. He danced continuously. This dance consisted of stooping nimbly in a sitting posture, almost touching the deck, with numerous hand pantomimes, accompanied all the while by moving the middle of his body, so that all of his ribs fluttered with astonishing speed, meanwhile keeping his two extremities

perfectly motionless. Because of this, he gave the impression of having extraordinarily flexible limbs and very strong abdominal muscles. At the end of his dance, our dancer complained of pain in his stomach and ribs.

Several among them, but not all of them had tatoos, which were not all the same. Like the people of Lukunor, they identify these lines by different islands. The name of one of these tatoo marks is Nama-Tatoo, of another Puluwat-Tatoo, etc.

After taking the midday observations, I tried to dismiss our visitors; but their canoes had scattered one by one and we were left with two islanders, one of them Lougoun, who both appeared very content. I explained to them that I planned to leave their islands immediately; they called to their canoes but they couldn't get the attention of any of them. We set our course to the northwest, running under full sail. Our guests thought that we were definitely departing, in spite of which they did not seem overly disturbed; they looked and talked very seriously among themselves about Losap and Puluwat, probably planning to ask to be dropped off at one of these islands. They dined at our table with gusto and gaity; when, on climbing the bridge, they saw that we were changing to a new tack and setting our course once again for Namoluk, they became wildly excited which showed us that they were glad they wouldn't be making this unintended voyage. Lougoun did all sorts of silly things; he put his hands on the rigging with the sailors and imitated their yells. He climbed up into the crow's nest and gave a shout; in a word, he behaved like a madman. Soon some canoes came to our attention but they hadn't made up their minds whether or not to board us so easily do savages become suspicious! Finally, however, the entreaties of their fellow islanders, dressed in white shirts and armed with axes, had their effect. They came under the stern and boarded us as before. After exchanging gifts, we parted in friendly fashion, and set our course to the north.

The Namoluk group is located 35 miles to the northwest of Lukunor. In coming from the north to the Mortlock Islands, we passed it at a distance of less than a dozen miles; this shows how easy it is to pass by islands of this kind without sighting them.

An interesting sequel to this early Russian contact with Namoluk occurred exactly 140 years later. In 1968, a Russian oceanographic research vessel from Vladivostok hove to off Namoluk at night. Seeing the lights, the men of Namoluk, who were out of cigarettes, thought that it was a Japanese fishing boat, and despite a high wind, resolved to paddle out to the ship to ask for tobacco. On approaching the vessel, their anticipation turned to fear when they recognized the Russian flag. Unable to return to Namoluk in their canoes because of the wind, the men fearfully climbed the rope ladder let over the side for them. Once aboard they were treated to a feast, drinks, and a warm dry place to spend the night. The next morning, the ship came close to the reef and after exchanging gifts and good wishes the men returned to Namoluk and the Russians continued on their expedition.

17. The people of Namoluk had indirect contact with westerners long before this date. The regular trade route from the Mortlocks to Truk brought news and goods from the Spanish occupation of the Marianas begun in the sixteenth

century. This reached Truk via ties to the atolls in the Central Carolines whose people made canoe voyages to the Marianas. Visiting and trade among the islands of the Mortlocks, especially between Namoluk and the Lowers, brought stories about and material items left by the ships that called at the spacious harbors of Lukunor and Satawan Atolls which were first visited by westerners in 1795 (Sharp 1960:177).

18. Gulick's source may have been none other than Andrew Cheyne since both men spent a great deal of time on Ponape (Shineberg 1971).

19. The Carl is known to have engaged in blackbirding for the German Godeffroy and Co. (Nason, personal communication).

20. This revitalization movement of the traditional religion, beginning in 1904, swept through all of the Mortlocks (Bliss 1906:66; Tolerton and Rauch n.d.: 182-83).

21. An Okinawan man married and spent more than ten years on Namoluk as an employee of Nanyo Boeki. He and three children by his Namoluk wife were lost while trying to escape Truk aboard ship in the bombardment of 1944. Two Japanese men employed by Nanyo Boeki also married and fathered children on Namoluk in the 1920s and 1930s.

22. Although the Germans appointed "flag chiefs" on Truk and some other islands, no such official was created by them on Namoluk. The Japanese introduced their own patrilineal notions of succession by appointing the son of the makal 'traditional atoll chief' on Namoluk to run things. When this man died, the Japanese replaced him with his son in turn.

23. Fischer's (1963:523) speculation that most of the men who attended the Japanese carpentry school on Palau were orphans is borne out partially by the Namoluk record. One of the two Namoluk men who went to Palau was an orphan.

24. The only time Japanese military personnel came to Namoluk in any numbers was when two lifeboats carrying a total of fifty men from a Maru torpedoed near Kapingamarangi reached Töinom in 1942. All of these men were taken to Truk shortly afterward aboard a small Japanese ship that came to pick them up. One of the steel lifeboats with oars was presented to the people of Namoluk as a thank-you for their hospitality and was used to haul copra until 1949 when rough seas broke it up on the reef.

25. From the symptoms described in answer to questions about this calamity, the disease is suspected to have been tuberculosis.

26. Part of this aid came from the three communities (Etal, Oneop, Möch) with whom Namoluk was arrayed in a traditional military alliance against Ta, Kuttu, Lukunor and Satawan. The contributions of Lukunor and Kuttu resulted from the etiquette that dictates in time of a typhoon all differences are laid aside and the Mortlocks help each other as a unit. In addition, both Kuttu and Lukunor are the original home for subclans that exist on Namoluk, and the ethic of clan unity entered into the picture.

27. In connection with the post-typhoon program, a deeper boat pass was blasted in the Namoluk reef and Namoluk people had their first long-term experience with Americans living on their atoll. American employees of the Truk District Agriculture Department, along with their families, spent up to six months on Namoluk immediately after the typhoon assisting in the reconstruction and replanting operations.

28. This also is reflected on Namoluk in the vastly increased number of land transactions involving money. For the period covered by the land tenure histories pre-typhoon (estimated conservatively at a century), only thirty sales of land for money are recorded and nearly all of these occurred after 1930. In marked contrast, thirty-nine sales of land for money have taken place in the short span of fourteen years since the typhoon.

29. The port-town/hinterland, district center/outer island dichotomy is an ideal type descended from Robert Redfield's folk/urban dichotomy (Miner 1952). While this latter construct has come in for a great deal of criticism, its Oceanic descendant (port-town/hinterland) provides a useful, albeit crude, way for viewing the contemporary Pacific world.

30. For a discussion of one such problem--juvenile delinquency--see Haser and White (1969).

31. Until the mid-1950s there were only two named villages on Namoluk islet: Pukos and Sōpwonewel. At that time, a third village--Lukelap--was created.

32. As of August, 1971, only one of these canoe houses diverged from the traditional construction style described in detail by Girschner (1912). In this single case, corrugated tin has replaced pandanus thatch as the roofing material.

33. Bingo first reached Truk in 1957 (Mahony 1960:481), and was brought to Namoluk shortly thereafter. There are three licensed bingo games on the atoll, all of which pay an island business tax of $10.00 per year and charge 5¢ per card per game to play. The game is pursued avidly day and night by both men and women.

34. In spite of this the period between government ships can be quite long and not every field trip brings trade goods or buys copra. For example, there was no such ship at Namoluk for three months from December, 1969--March, 1970. Both the Catholic and Protestant missions operate small ships that will accept passengers to Namoluk when there is room, but these ships do not buy copra or sell trade goods. In addition, Namoluk is sometimes visited by Japanese fishing boats and an occasional U.S. Navy or Coast Guard ship.

35. In the island election of November,1971, a thirty-five year old man was elected magistrate, and the secretary, treasurer, policemen and council averaged twenty-nine years in age. The legislator from Namoluk is only thirty-four years old, hence only the judge (age fifty-five) and the village "bosses" (average age forty-eight) represent the older generation in the Namoluk local government.

CHAPTER III. THE KINSHIP SYSTEM

1. In recent years, three borrowed kinship terms have come into regular use in address for which there were no traditional Namoluk equivalents. These are mama 'mother', and papa 'father' from English, and nono 'grandmother' from Ponapean.

2. The Namoluk terms all are given with their first person singular possessive suffix. Possessive suffixes for the Namoluk dialect of Trukese are -ei 'my', -om 'your singular'. -an 'his, hers, its', -am "our exclusive, -ach 'our inclusive', -ami 'your plural', and -ir 'their'.

3. The immediate descendants of the men of a lineage, subclan or clan are grouped together in a category called afakur 'heirs' or 'descendants of men of a descent group'.

4. By contrast, on Truk all children of the immediate descendants of men of ego's father's clan are referred to as 'child', regardless of speaker's sex or person referred to. Likewise, on Truk, male members of ego's own clan in higher generations are called 'father', and all members of ego's own clan in lower generations are called 'child', regardless of speaker's sex. Trukese employ two terms in place of the single Namoluk term for 'opposite sex sibling': feefinej is used by a man in referring to his 'sister', and mwäänni is used by a woman in referring to her 'brother' (Goodenough 1951).

5. Note the different placement of stress between the two sets of terms that determines the difference in meaning.

6. Naulap literally means 'big child' or 'old child', and is composed of the root nau 'child', the infix -lap- 'big' or 'old', and a personal possessive suffix. One informant speculated that the word makes reference to the fact that most stepchildren are taken when they are 'older' than natural or adoptive children.

7. This shows how it is possible, in the words of the well-known American folk song, for a woman to be her own "grandma!"

8. Caughey (1970:216) discovered only three cross-cousin marriages on Uman, Truk, where a special term for such marriage exists: fötoneeyimw 'to plant within the house'. Namoluk people have no such special term for cross-cousin marriage, referring to all marriage as pupwuulu 'marry' or 'have sexual intercourse' or pwuluani 'take as a spouse'.

9. Cross-cousin marriage is the rule rather than the exception throughout the Mortlocks. Tolerton and Rauch (n.d.) report a high incidence on Lukunor and elsewhere in the Lowers that is corroborated by Fischer (1957) and Nason (1970). In addition to the Namoluk material, genealogical data I collected for lineages on Nama, Oneop, and Pis Losap show a high percentage of cross-cousin marriage.

10. Also compare Fischer (1957:134) who writes:
> The tie between brother and sister is especially strong throughout Truk District....It is characterized both by a strong affection and obligations to help each other on the one hand and by a strong taboo against close contact on the other....These taboos were and are strictest when the brother and sister were close in age.

11. Today, adherence to 'stoop behavior' and to the 'puberty ceremony' is beginning to break down, and both are followed somewhat irregularly and desultorily. As a consequence, parents have begun to instruct their children on matters of incest and exogamy once they reach puberty whether or not they have undergone the ceremony. In former years, special "polite language" was required between persons who had to 'stoop' to each other. Today this has largely disappeared, although there is still an injunction against using "bad language" in the presence of such a person.

12. They may eat from the same dish, but they may not share a piece of food that might touch both of their mouths.

13. 'Stoop' restrictions for great-grandparents and persons in higher generations are the same as those for grandparents.

14. In 1951, Goodenough wrote that the category 'flesh and blood' on Romónum included patrilineally as well as matrilineally related persons, and he argued that it was essentially a modification of the "bilateral kindred" (as defined by Rivers). Recent data from Romónum, however, make it clear that on Romónum, as on Namoluk, one's 'flesh and blood' is made up entirely of uterines (Goodenough, personal communication).

15. Goodenough (1951) uses "sib" for what is here called a "clan" and "subsib" and "ramage" for what is here called a "subclan."

16. The following chart records the degrees of incestuous-endogamous behavior on Namoluk, proceeding from the most blameworthy to the least so (ego is of either sex):

NAMOLUK CATEGORY	ENGLISH GLOSS	KINSHIP RELATIONSHIPS INVOLVED
1. eu fütük	'one flesh and blood'	father-daughter; mother-son; brother-sister; members of the same subclan.
2. eu ainang	'one clan'	all members of the same clan with no closer relationship.
3. afakuran eu fütük	'descended from men of one flesh and blood'	patrilateral parallel cousins who are immediate descendants of men of the same subclan; one's mother and one's spouse are immediate descendants of men of the same subclan; patrilateral parallel cousins whose fathers are immediate descendants of men of the same subclan.

4. afakuran eu ainang	'descended from men of one clan'	patrilateral parallel cousins who are immediate descendants of men of the same clan; one's mother and one's spouse are immediate descendants of men of the same clan; patrilateral parallel cousins whose fathers are immediate descendants of men of the same clan.

17. The notable exception to this is between Wenikar-3 and Wenikar-4 subclans. Genealogical reconstruction and marriage patterns, coupled with informants' recollections that these two subclans are somehow "close," make it clear that one large subclan underwent fission of its two major lineages five generations ago, resulting in two new subclans.

18. An eighth clan is partially represented on Namoluk in the persons of the Protestant minister from Pis Losap (Masalö clan) and his wife and children from Moen (Imwo clan). Although this couple and their children consider themselves and are considered by others to be 'Namoluk citizens' for most purposes, they have been able to acquire only one small piece of dry land and one tiny taro plot on the atoll. They continue to maintain very close contact with Imwo lineage mates on Moen, and they support themselves primarily on land and taro plots belonging to the Protestant mission and on breadfruit and coconut trees to which they have acquired ownership rights (chapter 5). One of the minister's sons has married on Namoluk, and perhaps in another generation or two Imwo clan will become truly established on the atoll. At the moment, however, I have chosen to exclude it from consideration, on grounds that it is practically without land and therefore outside the Namoluk alliance system.

19. "Client lineages" are immigrant lineages from other islands that have settled on Namoluk, merged with an existing lineage or subclan, intermarried on the atoll, and thereby acquired land. Examples are Katamak-c, Wenikar-1d, and Wenikar-5a. Goodenough's (1951) discussion of clientship on Romonum holds equally for Namoluk.

20. Namoluk people compare those without a canoe house to baby chicks without a mother hen to shelter them from harm under her wings. It is said that a clan or subclan without a canoe house is weak, vulnerable, and may be close to dying out. Demographic facts from Namoluk support this belief. One of four such groups currently without a canoe house (Inemarau), will become extinct on the death of its two surviving members. Two other such groups (Wenikar-1 and Wenikar-5) recently came close to dying out on Namoluk, only to be bolstered by client lineages from Oneop. The fourth group "in jeopardy"--Söpwunipi--also came close to dying out in the first ascending generation. It seems not to have erected a canoe house today for lack of sufficient adult males to carry out the task. This clan is growing rapidly at present, and will not become extinct in the foreseeable future.

21. Except, of course, where client members have been taken in from other islands.

22. I shall refer to Namoluk descent groups by a code consisting of the clan name, plus a number indicating subclans, plus a lower case letter indicating lineage, e.g., Sör-1a.

23. Three of the five marriages from Namoluk to Sör-1a lineage on Nama have been made by members of Wenikar-2a and Wenikar-2b. Each of these two lineages has its strongest on-island alliance with Sör-1a lineage (see chapter 6, figures 5 and 6).

24. Money is not shared as freely or as willingly as pisek 'material goods', and the incursion of a semi-cash economy is beginning to make small inroads into the notion that kinsmen should share everything.

25. That this is so is demonstrated by the fact that the children of two 'formal friends' are covered by incest and exogamy restrictions as if their parents were 'siblings'.

CHAPTER IV. THE MARRIAGE SYSTEM

1. Kofŏt 'arranged marriage' or 'engagement' continues to be practiced on Namoluk, although with slightly declining frequency. In 'arranged marriages', the parents of both parties pledge themselves to the match and the couple is married soon after puberty, or today, after completion of their schooling. Breaking an 'arranged marriage' pledge, like breaking a marriage by divorce, calls for compensation of the wronged party by a payment of land (see chapter 5).

2. For example, a husband is responsible for working his wife's lands and it is he who takes products of the land to his wife's brother when his wife's brother tells him to do so.

3. Goodenough (1951) and others writing on Truk have stressed the importance of the sibling tie over the marital tie in Greater Trukese society.

4. Note the contrast with Truk here: "Both levirate and sororate proved to be preferential in theory, though accounting for only a moderate proportion of remarriages (Murdock and Goodenough 1947:343)." Writing about Uman, Truk, more recently, Caughey (1970:224-5) found that "...of the marriages which have ended in death with the surviving partner remarrying, approximately one-third involved remarriage into the lineage of the deceased spouse." It seems from these accounts that the sororate and levirate, among other things, may be practiced to a different extent on Romónum and Uman.

5. Two of these marriages to Soumŏch on Oneop were by Wenikar-1b women in sororal marriage with the former spouse of their Wenikar-1c 'sister' on Oneop who had died.

6. The usefulness and future potential of Namoluk-Truk alliances in a rapidly changing social scene are only beginning to become discernible to people on the atoll.

7. According to Tolerton and Rauch (n.d.), Lukunor adopted this custom in 1937 following the example of Namoluk and Etal.

8. Catholics are forbidden to divorce under canon law, however, when it has proved expedient this prohibition has been disregarded by Namoluk people.

9. This practice extends only to 'siblings' at the lineage level, and an adulterous affair with one's spouse's subclan 'sibling' or clan 'sibling' in a different subclan may result in payment of indemnity.

10. Indemnity for "adultery" with one's spouse's same sex lineage 'sibling' would mean that payment by this sibling would only shuffle land rights within a lineage and would not lead to a transfer of land between lineages.

11. The same number of plural marriages were reported by Goodenough (1951:123) for Romónum, Truk; but since the number of marriages recorded on Romónum was 397, whereas 949 marriages are contained in the Namoluk genealogies, polygamy was more common on Romónum than on Namoluk.

12. The fifth is mentally ill and unlikely to marry.

CHAPTER V. THE LAND TENURE SYSTEM

1. No one on the atoll is landless although some people have comparatively small holdings.

2. Quite often mach are inherited as masawan fanu 'contents of the land'.

3. Set is also the general word for 'salt water'.

4. Chu is an abbreviation of chufengen 'together'.

5. Fischer (1958:167) mentions a similar trend for islands in Truk Lagoon, and Nason (1970) observed this process on Etal.

6. This is surprising when one reflects that the standard price of one breadfruit tree--regardless of size--is $10.00 while coconut palms command $5.00 each. In addition, coconuts provide the major source of cash as copra. It appears that breadfruit is more highly valued as food than is the money to be derived from copra, and this finding is commensurate with the choice of land over money by three-fourths of the people questioned. Vern Carroll has suggested to me that breadfruit trees may be more highly valued than coconut palms because breadfruit trees take a longer time to become large and productive than coconut palms, and because breadfruit will not grow in as many places as coconuts.

7. Admission to high school is by competitive examination and only about one-fourth of the total number of eighth grade graduates in Truk District can be admitted at present. In a typical year for Namoluk, however, all of the island's eighth grade graduates entered high school in September, 1971. Currently, only one Namoluk citizen has obtained a B.A. degree, however, nine students from the atoll were enrolled in college or junior college in 1971. Others were enrolled in vocational training programs.

8. The percentages below of respondents choosing each islet in each pair are given below:

Namoluk 67 Tōinom 33	Tōinom 33 Namoluk 67	Amwes 12 Namoluk 88
Namoluk 76 Lukan 24	Tōinom 55 Amwes 45	Amwes 45 Tōinom 55
Namoluk 88 Amwes 12	Tōinom 74 Lukan 26	Amwes 66 Lukan 34
Namoluk 89 Umap 11	Tōinom 88 Umap 12	Amwes 87 Umap 13
Lukan 24 Namoluk 76	Umap 11 Namoluk 89	
Lukan 26 Tōinom 74	Umap 12 Tōinom 88	
Lukan 34 Amwes 66	Umap 13 Amwes 87	
Lukan 82 Umap 18	Umap 18 Lukan 82	

9. Specifically, 57/96 chap transactions were for divorce, 15/96 for adultery, 14/96 for injury, 4/96 for broken engagement and 3/96 each for polygamy and remarriage.

10. On all of the islands in the Upper and Lower Mortlocks except Etal, Lukunor and Namoluk, when a man gives his child a piece of land the child's lineage reciprocates with a gift of land in kind. Namoluk people view this practice as undesirable because it leads to much friction between the two kin groups and because when a child grows up and says, "This is my land from my father," his lineage mates will retort, "It is our land, not just yours, because we exchanged for it." Ostensibly, it was a recognition of this that led the people of Lukunor to copy the Namoluk-Etal custom in this regard.

11. Eighty-four out of the ninety-six indemnity cases in table 14.

CHAPTER VI. THE STRUCTURE OF SOLIDARITY AND ALLIANCE

1. This construct is taken from Barnes (1968). "Primary zones" are helpful in analysis because they permit clear representation of the direct alliances contracted by any descent group, extracted from the larger digraph that shows the totality of such alliances (figure 32). The primary zone for any lineage corresponds to what Jay (1964) calls an "activity field." The digraph for all primary zones taken together is what Jay refers to as a "network" (figure 32).

2. Where an adopted child's natural or adoptive parent's lineage was unknown--for whatever reason--that relationship was treated as a blank and only those relationships that could be calculated were included.

3. These two adoptions were by a woman and her S2a husband, who adopted the woman's 'siblings' sharing the same natural father but a different natural mother, following the death of the childrens' natural mother in childbirth.

4. Reference should be made to Marshall (n.d. b) for a detailed discussion of adoption, incest and exogamy.

5. The single survivor of W4b has permanently left Namoluk to marry and live on Etal.

6. The average is slightly misleading here because S1a has nine such alliances.

7. Note that 80 percent of the "missing links" here involve W4b--the weakening point of the Namoluk alliance system.

8. The missing lineage in F-W3 and F-SW alliances is Fc which is extinct; F subclan, therefore, is strongly allied to W3 and SW at the present time.

CHAPTER VII. CONCLUSIONS

1. An analogous custom exists on Namoluk. Food brought to a feast is always exchanged for food brought by others and no one consumes his own contribution.

2. A fruitful marriage results in an exchange of 'flesh and blood' since physical substance from two different descent units is mixed in the act of biological reproduction.

3. This fact was recognized long ago by Radcliffe-Brown who wrote "...the study of social structure leads immediately to the study of interests or values as the determinants of social relations....The simplest form of social solidarity is where two persons are both interested in bringing about a certain result and cooperate to that end (1965:199)."

4. Specifically, for Woleai, Lamotrek, Elato and Satawal Atolls.

5. With but minor alterations in detail, Alkire's presentation holds equally well for Namoluk. Three outstanding examples of dualism on Namoluk are the (former) two inhabited islets, each of which traditionally had two villages, and the division of people on the atoll into two groups for many competitive purposes: Wenikar and <u>tola</u> 'the rest' or 'all'. This latter category includes all non-Wenikar persons and thus the island's population is divided almost exactly in half. A good example of the triadic dualism inherent in Carolinian culture is the present division of Namoluk community into three named villages.

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