

**TAGMEMIC AND MATRIX
LINGUISTICS**

applied to

SELECTED

AFRICAN LANGUAGES

SUMMER INSTITUTE OF LINGUISTICS PUBLICATIONS
IN
LINGUISTICS AND RELATED FIELDS

PUBLICATION NUMBER 23

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APPLIED TO
SELECTED AFRICAN LANGUAGES

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Summer Institute of Linguistics
and
The University of Michigan

A Publication of the
Summer Institute of Linguistics
of the
University of Oklahoma
Norman

EDITOR'S NOTE

Tagmemic and Matrix Linguistics Applied to Selected African Languages was published in November 1966 in limited edition as the Final Report of Contract no. OE-5-14-065 with the Office of Education, U.S. Department of Health, Education, and Welfare. It is republished here in corrected form and with some of the original appendices omitted. It is intended that the publication of this material as a volume of the Summer Institute of Linguistics Publications in Linguistics and Related Fields will give it the wider distribution that it deserves. Students of African languages will find here a wealth of data and stimulating discussion that will, hopefully, lead to further study and research on a wide variety of linguistic topics. Those concerned with general linguistic theory will find concrete examples of the application of tagmemic and matrix principles developed by the author.

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INTRODUCTION

Goal. The purpose of this study is (1) to discuss the application of tagmemic and matrix techniques to some problems in African descriptive linguistics, and (2) to illustrate this application (a) with data from published sources, restated in tagmemic terms, and (b) with hitherto unpublished data, gathered principally by members of the Summer Institute of Linguistics.

By a tagmeme we mean a unit of grammar, such as the predicate or the object of a sentence; the tagmeme is viewed as having (a) function in a construction-- "object," for example--and (b) a set of forms--e.g., The boy, John, somebody--which can come in the appropriate slot. By a linguistic matrix we mean a table of language elements; rows and columns represent significant properties of a structural system or subsystem; entries in the boxes of the table signal properties of the system; and--preferably--the rows and columns are ordered so as to show in the most effective way possible the relation of the semantic properties of the system to groups of entries in the table.

It is assumed that most readers of this report will have had initial exposure to the tagmeme concept through--say--the introductory pedagogical treatment of Benjamin Elson and Velma Pickett¹; and the matrix concept seen in one of the available articles.² A tagmemic bibliography, complete up through 1964 but already outdated, is also available.³ An attempt to bring tagmemics into relation with some other theories (as of 1964, but also now incomplete because of rapid developments within other theoretical approaches) is found in bibliographical sections of my larger work⁴ on tagmemics.

From the first (1954) volume of this latter study, there was an attempt to locate and specify certain characteristics which were universal to all the languages of man--and to the structure of his nonverbal behavior as well. It was urged that all purposive human activity and perception were constrained by in-born elements of the human mechanism. Different languages--or sets of nonverbal behavior patterns--might be learned from one's cultural surroundings, but each such set was in turn re-

¹ An Introduction to Morphology and Syntax (Santa Ana, Calif.: Summer Institute of Linguistics) 1962.

Or the fuller treatment by Robert E. Longacre, Grammar Discovery Procedures (The Hague: Mouton and Company) 1964.

² For example, for syntax, Kenneth L. Pike, "A Syntactic Paradigm," Language, 39.216-30, 1963; or K. L. Pike, "Dimensions of Grammatical Constructions," Language, 38.221-44, 1962; for morphology, K. L. Pike, "Non-linear Order and Antiredundancy in German Morphological Matrices," Zeitschrift für Mundartforschung, 32.193-221, 1965.

³ K. L. Pike, "A Guide to Publications Related to Tagmemic Theory," Current Trends in Linguistics³: Theoretical Foundations, (T. A. Sebeok, Editor) (The Hague: Mouton and Company) 1966, pp. 365-394.

⁴ Kenneth L. Pike, Language in Relation to a Unified Theory of the Structure of Human Behavior, Second Edition (The Hague: Mouton and Company) 1967. (Preliminary edition Vol. I, § 1-7, 1954; Vol. II, § 8-10, 1955; Vol. III, § 11-17, 1960.)

stricted by the nature of man himself. I sought there to exploit samples of observed characteristics of language behavior to deduce limits on the total kinds of possible language features. Extrapolation from these samples aimed at a systematic, "etic" summary and presentation of this kind of language potential.

Among the universal characteristics postulated was the presence of units in all languages. It was affirmed that units, to be presented adequately, must be described in reference to contrasts between them, variability within them, and distribution of small units within larger units and within classes and systems of units. Inclusion within successively larger units was possible, in turn, only within a theory such as tagmemics which gave due weight to a universal of hierarchical ordering of units. Since, however, the borders of unit types did not always coincide, a multiple-hierarchical approach (lexicon, phonology, grammar) had to be postulated (with analogues in nonverbal areas) --and these features, also, were set up as universals. Relation between these hierarchies, in turn, involved fusion between units of one hierarchy (e.g., lexicon) in part induced by their inclusion in--and modification by--another (e.g., the high-level phonological units such as stress groups).

The emphasis of the approach was heavily heuristic: The scheme of concepts, etic typologies, and unit descriptions, was utilized first of all as a basis for the search for pattern in language. The discovery of structure within numerous languages was greatly facilitated thereby.

Later (say 1959 to 1965) the portrayal of certain kinds of pattern was aided by the development of tabular displays (matrices) in which contrastive features of a syntactic system served as the dimensions of the system (much as articulatory features serve as the dimensions of a phonetic chart). Through the relationship between such matrices, the relationship between sentences could be more easily discussed. Pattern seen through matrix, furthermore, was treated as a conceptual framework of field, in this over-view of language. Particle, wave, and field provided diverse perspectives for emphases on static, dynamic, and functional characteristics of units-in-system.

Units were seen first of all as particles segmented out of the stream of speech. When, however, the units were viewed as having indeterminate nonsegmentable boundaries in a dynamic flowing hierarchy of nuclear and marginal elements, a wave perspective was more appropriate. As points in an intersecting set of contrastive categories, units such as clauses were seen in field perspective.

The extension of the matrix approach to morphological data led to the development of technological procedures for grouping together bits of material which, in a classical approach, would be seen as highly irregular. In a matrix approach some of these appeared to have other kinds of regularity. The field approach probed beneath the morphemic layer of structure--threatening the classical view of the morpheme, but re-establishing the morpheme as a special instance of a field formative. (A simple morpheme, in this view, is a vector formative, a phonological segment coming in each cell of one vector--one row or one column--of a matrix, and therefore in a one-to-one relation of phonological shape to matrix category). Irregular morphemic systems were thereby seen in a different perspective. Irregularity, from one viewpoint, might sometimes represent regularity from another.

Meanwhile, the development of transformational grammar had had a heavy impact on linguistic studies. Tagmemic investigations had not been immune. It seems highly probable that the implicit transformational question⁵ "How are sentences related?" as further developed by Noam Chomsky⁶ may have hastened the development of such approaches as that of matrix multiplication. Earlier yet, the work⁷ of Lounsbury and Goodenough on kinship systems was an encouragement to develop clause matrices. I am happy to acknowledge these influences. Already many tagmemic descriptions are using a transformational component, encouraging us to dream, as I stated in 1960,⁸ that the two approaches should some day 'come to a point of complete overlap.'

The generative approach to grammatical description, as worked out by Chomsky and his associates, is also beginning to have its impact on tagmemic discussion. Longacre, for example, has given us a first attempt⁹ at making explicit the generative power of tagmemic formulas. On the whole, nevertheless, tagmemics has itself had a much greater contribution to heuristic procedures than to the deductive ones. This is not surprising, in view of the many unwritten languages being studied¹⁰ by people trained in tagmemic theory and practice. In such circumstances, the search for pattern must precede any descriptive or generative grammar.

Tagmemic interests, furthermore, have continued to broaden. From a simple discussion--or listing--of types of discourse in 1954, study has now widened¹¹ to include the nature of paragraphs, and the study of principles of rhetoric itself--or the discussion of poetry. From the early treatment of nonverbal behavior have grown

⁵ See Zellig S. Harris, "Discourse Analysis," Language, 28.1-30 (1952).

⁶ For example, in its early form in his Syntactic Structures, (The Hague: Mouton and Company) 1957.

⁷ Floyd G. Lounsbury, "A Semantic Analysis of the Pawnee Kinship Usage," Language, 32.158-94 (1956); Ward H. Goodenough, "Componential Analysis and the Study of Meaning," Language, 32.195-216 (1956).

⁸ See my Language . . . , III, p. 36.

⁹ Grammar . . . , pp. 24-34. The need for grammars to be able to generate sentences, however, has long been implicit in the presentations such as that of Doria Cox, "Candoshi Verb Inflection," International Journal of American Linguistics, 23.129-40 (1957) (where verb structures are given in detail) and that of William Wonderly, "Zoque I: Introduction and Bibliography," International Journal of American Linguistics, 17.1-9 (1951) where the need for productivity of formulas beyond the limits of a closed corpus is insisted upon--and found necessary for persons who wish to do grammatical analyses as a basis for creating a written literature in a language.

¹⁰ The Summer Institute of Linguistics has work going on in more than 400 languages. Their researchers in these languages have been exposed, to some degree, to tagmemic concepts. When a component of the theory would not work in these contexts it was revised.

¹¹ For example, K.L. Pike, "Beyond the Sentence," College Composition and Communication, 15.129-35 (1964); and Alton Becker, "A Tagmemic Approach to Paragraph Analysis," College Composition and Communications, 16.237-42 (1965). Since this report was written (1966) further studies have been written: Alleen A. Reid, Ruth G. Bishop, Ella M. Button, and Robert E. Longacre, Totonac: from Clause to Discourse, Summer Institute of Linguistics Publications in Linguistics and Related Fields, #17 (Norman, Okla., 1968); M. Catherine Peekc, Preliminary Grammar of Auca (Ecuador), Indiana University Dissertation, 1968; Mary Ruth Wise, Identification of Participants in Discourse, University of Michigan Dissertation, 1968; Robert E. Longacre, Vols. I and III of Discourse, Paragraph and Sentence Structure in Selected Philippine Languages, Dec. 1968 (Final Report for Office of Education, No. 0-8-062838-0391); Richard Yound, Alton Becker, and Kenneth L. Pike, Rhetoric: Discovery and Change, (Harcourt Brace, 1970, in press).

extensive studies of social community.¹² Pedagogical principles¹³ have also been illuminated.

Even so, however, a severe limitation lay on the theory: Its basis was a biased sample, with its inductive sources chosen largely from languages of North America, South America, New Guinea, and the Philippines. The postulated language--or human--universals needed to be tested in Africa and in the Orient before the empirical sample was large enough to allow us to rest assured of adequate coverage. What, specifically, might a study of African languages reveal which would either confirm the usefulness of the tagmemic view of human nature and human languages or force its rejection, revision, or amplification?

Data of the real world are notoriously more varied than the unaided imagination of man. The philosopher at his desk has never been able to concoct a world as rich as that outside his window. Such a large block of the world as Africa, therefore, could likely be concealing some surprises. These surprises might be of several general kinds. One is the addition of new kinds of data never seen before. Another brings forth data which are "new" in a subtler sense: It consists of the discovery of an exaggerated form of a known problem--a problem which previously was known only in a form so simple that it did not warrant the development of an elaborate apparatus to handle it--or so simple that it was not complex enough to allow the researcher to predict the kind of formula needed for which this known problem was but a special instance. A third type of surprise is one for which there is less excuse, but which meets us all: the forcing to attention of data already described by other researchers, but in a language in which he has had but little interest, so that the special solutions already achieved have not had their deserved impact on him.

All of these were found in the African project being reported here. An early search of the literature, with the help of graduate students who attempted to restate in tagmemic terms data from various parts of Africa, guaranteed broader coverage than could otherwise have been achieved. The written sources included reference to West, East, and South Africa. Study of live data was confined to West Africa--to Ghana, Nigeria, and Dahomey.

Of kinds of material new to me, perhaps the most interesting was on discourse structure. The intricate "ranking" matrices--or the ordered rules--required to describe the Bariba use of direct versus indirect quotations were elegant in beauty and totally unexpected. It was almost as if stage directions for spotlighting characters were translated into language rules.

Equally surprising and elegant--though with less obvious semantic implications--were the elaborate matrix relations required to give insight into the subtle traces of broken-down concord in Abua verbs. When an independent object occurred in the clause, verb prefixes sometimes underwent a set of changes which could be understood best as the fusion of forms of an old lost concord matrix.

A further surprise came with the concord elements in Etung noun classes. Here there were patterned constraints in the relation of singular to plural forms, determined by a ranking of reconstructed front versus back elements (such that singular

¹² Cf. Philip Bock, The Social Structure of a Canadian Indian Reserve, Harvard University Ph.D. Dissertation, 1962; and Philip Bock, "Social Structure and Language Structure," Southwestern Journal of Anthropology, 20.393-403 (1964).

¹³ K.L. Pike, "Nucleation," The Modern Language Journal, 44.291-95 (1960).

form x could be paralleled by plural y, z, or w; singular y by plural z or w; singular z by plural w, etc.). These two results were especially gratifying, in that the study of concord was one of the particular aims of the project, since prior work on morphological forms had implied that complexity of this type might be illuminated by this approach. Matrix approaches, therefore, were justified not only for the micro-analysis of concord relations--as we had hoped--but also for macro-analysis in discourse structure. Further support to micro-analysis came from work in Bimoba verbs (where scattered remnants of regularity could be abstracted from massive irregularity), and in Kasem noun forms. Support for discourse analysis in tagmemic terms came additionally from Sisala (with time words marking early places in discourse) and from Vagala (with sequences of sentences, the first of them marked for focus, comprising emic paragraphs).

A kind of structure which I had previously observed (in some variety) in New Guinea, but for which I then had no useful solution,¹⁴ was a major, accentuated problem in West Africa: Clauses occurred in a series, or cluster, such that several could share the subject of the first (omitted from the remaining clauses of the series), the object of the first (or each have its own object), and some other tagmeme or tagmemes (e.g., location). This kind of grouping led to several consequences: (1) the whole series formed one entity, as in Kasem, distributed in a sentence slot; (2) certain standard types of sequences could, by various historical stages, decay into lower-level verb phrases (with one of the original free verbs becoming a verbal auxiliary or particle), as in Vagala; or, on the contrary, (3) the original series could remain a subcluster, but become tagmemicly specialized (filling a slot in a larger including cluster), building up higher-level structures.

Probably tone structures, on the other hand, best illustrate the kind of problem which had been described by other scholars, but not adequately worked into my own thinking. In the middle of this century, William Welmers¹⁵ called attention to "terrace tones." (This is a phenomenon where a tone which normally is high after another high is sometimes lowered a bit after a high--but continues to have following it, at whatever level it then happens to be, other high tones of the same system. Both the original high and the stepped-down high contrast with a low in that position after high. The step-down is often occasioned, historically, by the loss of a low tone from between the two original highs, which lowered the second of the two by--then--non-phonemic conditioned variation.) I have enjoyed experimenting with treating the "downsteppingness" as a "process" phoneme--rather than as a segmental one.

The extensive morphophonemic changes, furthermore, require a special handling of the relation of tone patterns to words as wholes¹⁶ rather than to stems or affixes as more-or-less discrete parts. Work on Etung and Bimoba highlighted this problem at the interface between lexicon, grammar, and phonology.

In phonetics proper, the most interesting item was the study of vowel quality

¹⁴ See now, however, Joy McCarthy, "Clause Chaining in Kanite," Anthropological Linguistics, 7.5.59-70 (1965).

¹⁵ In "Tonemics, Morphophonemics, and Tonal Morphemes," General Linguistics, 4.1-9 (1959). I had not known of this phenomenon when I published my book on tone languages in 1948.

¹⁶ Versus my skepticism concerning this possibility expressed in my Tone Languages (Ann Arbor: University of Michigan Press) 1948m p.11 fn 22.

underlying the vowel harmony of Twi, a study undertaken with Dr. John M. Stewart,¹⁷ (who emphasized the linguistic reasons for needing a--Firthian--prosody for the "close" subset) and Dr. Ruth M. Brend of the University of Michigan and Michigan State University (who with Charles Peck of the University of Michigan provided the instrumental analysis). Instead of treating /i/ and /I/ as differing by either tense and lax, or close and open features, it appears best to treat the "open" set as basic, with the other set modified by having the root of the tongue thrust forward.

Various other analytical problems (e.g., of negative as a clause type; or of paralinguistics and its relation to gesture in Mbembe) and pedagogical ones (e.g., the techniques of planning a course of study, before the analysis was complete, so one could simultaneously carry on further research, and learn the language) added to the complexities of the project as a whole.

Before reaching Africa I was able to consult with various scholars who very kindly suggested areas of concern which warranted investigation, and gave me valuable bibliographical references. Among these scholars were Professor Jack Berry, Northwestern University; Professors H.A. Gleason and W. Samarin, then of Hartford Seminary Foundation; Earl W. Stevick, Foreign Service Institute; Professor A. E. Meussen, Musee Royal de L'Afrique Centrale, Tervuren, Belgium; Dra. Bertha Siertsema, Free University of Amsterdam. From some old (1954) lecture tapes of Professor William Welmers, University of California at Los Angeles, I had access to data previously made available to members of the Summer Institute of Linguistics. Before reaching Africa, also, I had available some preliminary tagmemic restatements of work by other scholars, made by graduate students Krohn (Shona), Sherman (Grebo), Rensch (Bobangi), Kappler (Hausa), Nicklas (Tswana).

The time in Africa was divided into two parts. In Ghana, various members of the Summer Institute of Linguistics gathered at Accra with their informants from November, 1965, through the middle of January, 1966.

The personnel and the languages involved were:

John and Kathleen Callow, Kasem
 Jack Kennedy, Dagaari
 Gill Jacobs, Bimoba
 Monica Cox, Basare
 Marjorie Crouch, Vagala
 Ron and Muriel Rowland, Sisala

From the middle of January until the end of March a second workshop was held at the University of Nigeria, Nsukka.

Members of the Summer Institute of Linguistics, with the languages studied at the workshop were:

Ian and Amelia Gardner, Abua
 Paul and Inge Meier, Izi (and Dr. John Bendor-Samuel, Consultant)
 Katharine Barnwell, and Patricia Revill, Mbembe
 Richard and Nancy Bergman, Igede
 Klaus and Janice Spreda, Agbo (and Dr. John Bendor-Samuel, Consultant)
 Thomas and Eileen Edmondson, Etung
 Elaine Thomas, Degema and Engenni

¹⁷ See his "Tongue Root Position in Akan Vowel Harmony", Phonetica, 16.185-204 (1967).

Member of the Sudan Interior Mission, Miss Jean Soutar, Bariba

Members of the Assemblies of God Mission:

Irene Crane and Ruby Peterson, Bette.

Member of the Evangelical Lutheran Mission (not an official member of the workshop, but making data available to us):

Herbert Stahlke, Yachi

In each instance, I first ran through the available published and unpublished data of members of the workshop, watching for clues to material which might lend itself to the testing of tagmemic and matrix approaches. Some of the analyses were already arranged in such a way as to allow immediate partial transfer to the desired framework. Other material was obviously accessible to the members of the workshop (each of whom spoke the language concerned) through their informants.

Data as already available or as gathered for this purpose were presented to the whole group, discussed, revised, and amplified. In several instances the data were then discussed in fuller form, in materials co-authored by the present writer, so as to allow maximum relation to the theoretical problems of broader relevance to the project as a whole.

Special assignments to particular individuals, furthermore, filled in various lacunae in reference to over-all coverage of the phonological and grammatical hierarchies. The latter were principally in focus. Lexical (or related semantic) problems were not dealt with at any length, but left for further study.

The following list of Niger-Congo languages of West Africa attempts to place them in some kind of genetic order--following Greenberg's groupings (shown by his code symbols such as IA3) occasionally supplemented by unpublished data and calculated guess where necessary, from Bendor-Samuel, who also supplied me with crude estimates of numbers of speakers of these languages.

NIGER-CONGO LANGUAGES (after Greenberg)

	Country	Estimated Population
Gur (Voltaic) IA3		
Grusi IA3c		
Kasem	Ghana	45,000
Vagala	Ghana	10,000
Sisala	Ghana	60,000
Dagaari IA3d	Ghana and Upper Volta	200,000
Bariba IA3g	Dahomey and Nigeria	100,000
Gurma IA3g		
Bimoba	Ghana	50,000
Basari	Ghana	40,000
Kwa IA4		
Akan-Twi IA4b	Ghana	
Degema IA4e	Nigeria	10,000
(related to Greenberg's Blni)		
Engenni IA4e	Nigeria	25,000

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	Country	Estimated Population
Igede IA4f (?)	Nigeria	10,000 (?)
Yachi IA4f	Nigeria	12,000
Izi IA4g	Nigeria	200,000
Benue-Congo IA5		
Abua	Nigeria	20,000
Agbo IA5C (?)	Nigeria	15,000
(related to Mbembe)		
Bette IA5C1	Nigeria	17,000
(related to Bekwarra)		
Mbembe IA5C3 (?)	Nigeria	50,000
(related to Ukelle; rather than to Greenberg's Mbembe)		
Bantoid IA5D		
Etung IA5D	Nigeria	10,000

Concordances made from texts in Vagala and Sisala were produced at the University of Oklahoma by the Linguistic Retrieval Project for Aboriginal Languages, partially supported by National Science Foundation grants GS-270 and GS-934. Input data on magnetic tape are archived at the University of Oklahoma.

I. CLAUSES

In this chapter clauses are in view, and the central question is: Can clause typology, structure, and dynamics for an area as a whole be conveniently discussed in a tagmemic framework? Can we, that is to say, study the selected basic likenesses --or differences-- in a substantial number of languages (whether closely related, distantly related, or unrelated) without being overwhelmed by detail? In this chapter we attempt to show, on preliminary African data, that the answer to each of these questions is definitely yes. More detail must await the publication of articles and monographs now in preparation.

1.1. Clause Typology. The data on which this chapter is based have been gathered only in a preliminary form. One special caution grows out of this: The reader must not argue from silence. Whereas any particular datum reported is present in the language concerned (although, even here, later revision may in some instances yet cause changes), the absence of a clause type in the tentative description has far less probability of continuing to be confirmed.

Precisely here a prime heuristic value of the preliminary cross-language comparison is in evidence: Languages of a particular area, from the same language family, often share many grammatical characteristics; an item reported in one suggests a search in texts (or, with due care, with the help of an informant) for the comparable type in the second. If the type does not occur in a large body of text, and if the informant will not create such a form (as a translation of an English eliciting model), or rejects suggested forms created by the analyst on an analogical basis, the absence then appears to be more significant, and may enter the permanent description as a null cell in the clause matrix.

1.1.1. Basic (Kernel, Nuclear) Clause Types. The first generalization for the region¹ of West Africa: within the nucleus of their clause systems (i.e., within the kernel, and so basic or central to the system) the languages have the clause set:

Intransitive (without object)

Transitive (with optional direct object)

Ditransitive (with optional--or obligatory--indirect object)

This at first seems either trivial, because expected human nature requires--on occasion--reference to an action by someone without reference to another dramatis persona (or element) involved; action by one person or element on another; and action by a first party on a second party or item, in reference to a third. These same data seem important if one is searching for language universals, since the human necessity for the presence of these relationships by no means requires that they be formalized in every language in the same way.

¹Based, of course, on our limited sample--a restriction which we shall not repeat each time, but which may lead to modifications later. The Niger-Congo languages of Ghana and Nigeria which we refer to as our primary sources for clause data are largely Bariba, Dagaari, Kasem, Vagala, Degema, Igede, Mbembe--and, from secondary sources, Twi.

Precisely here some elegant formal surprises creep in: A kind of arbitrariness, overriding universal probability, becomes formalized. Normally in Twi, for example, J. M. Stewart² has shown (1) that when two pronouns are expected after a verb, the first as indirect object and the second as direct (paralleling the normal occurrence of two nouns in this position) the construction is not allowed to occur, because of a restriction which allows the pronoun to come only directly after the verb, and not after another pronoun. The desired communication effect, therefore, is achieved by replacing the construction with a more complex form (which will be further discussed in § 2.2).

The etically expected-- but unallowed--

* ɔ - femm	me	no
* 'he-lent	me	it'

(analogous to the acceptable

ɔ - femm	me	ne pônkó	nó
'he-lent	me	his horse	that'

is replaced by the acceptable

ɔ - de	nó	femm	me
'he-take	it	lent	me'

paralleling the optional-- also acceptable--

ɔ de	ne	pônkó	nó	femm	me
'he-take	his	horse	that	lent	me'

Stewart also shows that a further restriction applies (with ditransitive verbs).

With 'give', for example, the possibilities for the direct object not only exclude the pronoun (after the indirect object) but also exclude a definite nominal object in that position; only an indefinite nominal is allowed there.

Thus the definite

* ɔ - de	me	siká	nó
* 'he-gave	me	money	<u>the</u> '

must be transformed into the more complex

ɔ - de	siká	nó	maa	me
'he-take	money	the	gave	me'

Whereas the indefinite

ɔ - maa	me	siká
'he-gave	me (some)	money'

does not need to be transformed. But this restriction, like the one on pronoun objects, could not have been predicted by etic probabilities--i.e., by human cultural universals or near-universals.

If, furthermore, one wishes to say

'He cut the meat with a knife.'

one finds (still using Stewart's data) that no simple clause will permit it. A complex construction is necessary for the expression of the instrumental relation, even when an indefinite noun phrase is used:

ɔ - de	sékán	twaá	nám	nó
'he-take	knife	cut	meat	that'

²In an article entitled 'Some Restrictions on Objects in Twi,' Journal of African Languages, 2.145-49 (1963).

Here a universally expected etic relation, expected with a high degree of probability within simple clauses, is realized only through a different kind of construction. The result is that the list of non-complex clauses will appear to have an etic gap at this point; and complex constructions (clause clusters, see §2.2) will be forced to occur more frequently and to be more varied in kind, than one might have guessed.

The implications of the preceding data for an etics and an emics of clause analysis are at least three:

(1) A compilation of known clause types is needed, classified in some convenient way. Preferably, experience shows us, this should not be a mere random list of types, nor even a hierarchy of successively more inclusive types only, but rather (a) some kind of dimensional display (like a phonetic chart) with intersecting categories--which allows the reader to abstract classes, at will, from various viewpoints (from rows, or from columns, for example, rather than forcing, by a tree structure, some one predigested set), and (b) some device for cutting unwieldiness (when the chart gets too large), through 'multiplication' of basic matrices by simple elements or by other matrices (or by some other kind of transformational device--e.g., by transformational commentary, if the complexity is little enough to make the matrix devices appear to be more cumbersome than needed).

(2) Emic analyses of clauses are needed, one language at a time. (a) The sum of these emic clauses becomes the list for a general--universal--etics under (1). (b) The specific emic clauses need to be studied for variation, as seen for the Twi constructions containing pronoun forms and definite object forms discussed above. (c) In order to differentiate these variants from the emic clauses themselves, contrast between emic clause types must be specified.

(3) Since (a) it is apparent in the Twi data that specific tagmemes or even manifesting variants of tagmemes within a clause--e.g., the direct object--may affect the possibility of the occurrences of that clause, and since (b) a concept such as instrumentality, which in other languages may be often found manifested by a tagmeme within a clause but here is realized, rather, on a different hierarchical level, it is important, before analysis is assumed to be complete, that the analysis based on--for example--clauses abstracted from text be supplemented by eliciting techniques (with the safeguards necessary and appropriate to all eliciting techniques). One must see how a particular language expresses those various kinds of concepts reported in other languages, expressed in some of them within clauses, and assumed to represent human conceptual universals.

On the other hand, it is important that the clauses of each language be studied in reference to its own system, for their distinguishing, contrastive, formal and informal features; for their kinds and ranges of variability; and for their structural and transformational relations to, and distribution within, higher-level or lower-level structures. If one then chooses to do so, comparison of one area--e.g., West Africa--can be made with other areas of the world. This, however, is a goal beyond the purview of our present study--but within the larger goal of which this study has been but one part.

With these elements now more explicitly in mind, we return to the listing of some clause types observed in West Africa--a list begun, above, with mention of the intransitive, transitive, and ditransitive.

Probably most, if not all, of these Niger-Congo languages have also a clause type which may be called Locative (or Directive). (Reported, in our data, for Dagaari, Vagala, Kasem, Bariha, Mbembe.) In Mbembe, for example, a small number of verb roots are classified as directives: yin 'come, go, fetch' and ta 'go' being among the most common. They are often followed directly by a noun indicating a place (e.g., *épyá* 'market', or a prepositional phrase made up of a preposition plus one of these nouns:

	<i>ò</i> - ta	<i>épyá</i>	
	'he-goes	market'	
or	<i>ò</i> - tá	sa	<i>épyá</i>
	'he-goes	to	market'

See, also, Bimoba:

n	saa	daak	nie
I	am-going	market	in
'I	am going	to	market.'

Considerably uncertainty³ has come when analysts have attempted to treat the locational noun as a direct object of locational-directive verbs such as these, since the locational clauses contrast with transitive clauses not only by the potential expansion of locative noun to locative prepositional phrase, but also in that they cannot undergo certain transformations allowed to the transitives:

	<i>òte</i>	<i>ó!ci</i>	<i>étèn</i>	
	'father	eats	meat'	
or	<i>òte</i>	<i>ó!tóga</i>	<i>étèn</i>	<i>òcí</i> (cf., above, similar transformation with indirect object)
	'father	takes	meat	eats'
but not	* <i>òté</i>	<i>ó!óga</i>	<i>épyá</i>	<i>òta</i> goes'
	* father	takes	market	

nor may directive--as different from transitive--function as the first element of a result clause composite.

In Twi (continuing with Stewart's data) there seems to be a restriction such that locative noun phrases may follow certain locative verbs, but the same locative expressions may not follow--where we might expect them to--certain other verbs plus object; we cannot say, there,

* kofi	guu	ntomá	nó	á-dí ¹ ká	nó	mú
* Kofi	put	the cloth	in	the	box	

even though it is acceptable to say

ntomá	nó	gu	adá ¹ ká	nó	mú
'the cloth	is	in	the	box'	

Mbembe, however, does allow a locative phrase, after direct object, and also the corresponding complex form:

<i>ò-yíka</i>	<i>íjò:k</i>	<i>ña</i>	<i>ékpâ</i>
'he put	snake	in	bag'
<i>ò-tóka</i>	<i>íjò:k</i>	<i>ò-yíká</i>	<i>ña ékpâ</i>
'he-took	snake	put	in bag'

An alternative hypothesis which might well be explored for Mbembe (and Twi?) would be to set up a pair of clause types:

³For Twi, cf. Stewart, *op. cit.* p. 149; "'come, bring, send" ... can be either intransitive or transitive, but which paradoxically never have a direct object even when transitive.'

Locative-intransitive

and Locative-transitive

(with 'go' and 'put' as typical of their verbs) contrasting with each other and with the regular intransitive and transitive. I do not know how this would work out in view of the whole system.

In most of these languages (e.g., Dagaari, Vagala, Kasem, Bariba, Igede, Mbembe, Degema) one finds some kind of:

Stative.

For Dagaari note:

ú zòng
'he is-blind'

For Vagala, note the alternative forms:

ù wéysó
'he is-good'
or ù dú wéyr
'he is good'

Occasionally this area of form and meaning is divided by the authors into Equative (or Copulative) and Stative, in which the equative has a predicate nominative, and the stative a special verb plus predicate adjective, or a verb which carries both the affirmative and the quantitative (as in the Vagala example just given). For Degema, compare:

ómó-yò a6'j
'[the] child-emphatic is-there' (stative)
ómó-yò ò-yín ómó-mòsì
child-emphatic 3rd-sg. -be child male
'The child is a male.'

A further pair of emic (contrastive) clause types posited for some of these languages (Dagaari, Vagala) is:

Descriptive versus Demonstrative.

In Dagaari, for example, special verb forms differentiate these from each other, and from statives and intransitives. In addition, the subject of the demonstrative clause is an emphatic type, and demonstrative tagmeme following the verb may be manifested by a demonstrative particle--and other items--not found in the slot following a descriptive or stative verb.

ù wàà nìng-kpowng
'he is person-king'
únj lá à dǎó
'he (emph) is the man'

Less clear, but probably necessary to add to the list of numerous West African languages is the

Impersonal.

In Kasem, some clauses with the subject ku 'it' differ in function from intransitive clauses which superficially look like them. In a clause cluster (or series, see § 2.2), for example, the impersonal pronoun subject may occur within the series which has a different pronoun subject, where Kasem otherwise would require uniformity. Note the $\bar{o} . . . \bar{o}$ series with intervening kù:

. . . ō vùw ō ìòowri kù māngi dí súwla fíntò ō gyā bà
 he go he beg it approx. with shillings thirty he take come
 'He went out and obtained thirty shillings by begging and
 brought it back.'

In Bimoba the impersonal, as distinct from the intransitive, cannot be followed by other basic clause types in a series (§2.2.2).

1.1.2. Derived (Marginal) Clause Types. If a clause system is assumed to have nuclear (as in §1.1.1) and marginal elements--i.e., if the system itself is viewed as having a "wave" form--then the marginal kinds of clauses are those which can be treated as in some sense derivable from--or peripheral to, or transformed from--the nuclear system. Severable kinds of peripheral clauses occur in various of the Niger-Congo languages:

Modal: Interrogative, Imperative, Subjunctive
 Qualitative: Negative
 Emphatic
 Causal
 Benefactive
 Dependent: Subordinate, Relative

In Dagaari, for example, all basic types can be transformed to interrogative and imperative modes, as well as to negative and emphatic types (data not available concerning causative or benefactive).

Mbembe is set up by Barnwell, tentatively, as having basic intransitive, transitive, ditransitive, copulative, directive, motive (i.e., a directive after a verb which takes an object, as in 'Father sends [the] child [to fetch] meat'), stative, initiative (as in 'Father begins meat to-eat'), independent introductory, dependent introductory. Each of these can be transformed into imperative, subjunctive, interrogative, subordinate, and relative--though some of the forms have thus far been found only in elicited data, and not in test. Contrastive features of form and meaning differentiate the types. Imperative, for example, has obligatory absence both of independent subject (with one exception in the data) and of person and tense subject prefixes; certain imperative verb prefixes (ma- plural); and imperative tone patterns. Contrast:

	òṭe	ó [!] ci	étèn
		'father	eats meat'
with	ci	étèn	
	'eat	meat'	

The negatives in Mbembe--and various other West African languages--are so different from the positives that analysts sometimes prefer to set them up as separate clause types, derived from the positive ones. Mbembe negative imperfect indicative moves the predicate to the end of the clause, adds a negative verbal -n, utilizes a distinctive tone pattern (` `), and utilizes a Group 1 vowel for the final vowel of the verb. Compare:

òṭe	ó [!] ci	étèn	sa	ṣ [!] ṣò:m
'father	eats	meat	in	house'
òṭe	étèn	sa	ṣ [!] sò:m	mòcǎ
'father	meat	in	house	won't-eat'

The perfect indicative contrasts with the imperfect by having the predicate follow the object (but precede the locative margin); with object (or predicate) preceded by clitic k'; with different tone patterns; and with verb-suffix -a. From this the corresponding negative has predicate as clause final; negative verb prefix k'; a further distinctive tone pattern; and a Group 2 vowel as final in verb:

òté k'étèn òcá' sa òşó:m
 'father meat ate in house'
 òte étèn sa ǔ'şó:'m kó'ǒf
 'father meat in house hasn't-eaten

Imperative and subjunctive, etc., have further changes for negative.

Some scholars feel that the extensive changes for aspect, as seen above for Mbembe, make it desirable to treat these as transforms also. Kennedy, for Dagaari, first sets up a matrix to show basic types (with the possibility of transforms to emphasis, mode, and dependency)--see Dagaari Matrix I; note gaps--signalled by hyphens--for *imperative stative, and *imperative demonstrative, as well as limitation of locative and demonstrative forms to positive qualities only. (Negative locative concept is expressed by a special negative verb--not by a regular verb negated by a particle--and that negative verb must be followed by a locative word béy 'there', as in ù ché béy 'He is-not-located there'.)

DAGAARI MATRIX I: Occurrence-Matrix of Basic Clause Types with Some Permitted Transformations

Transformed to: Tense Emphatic Interrogative Imperative Dependent

Basic Form (in Perfective or Imperfective Aspect)	Tense	Emphatic	Interrogative	Imperative	Dependent
Ditransitive	x	x	x	x	x
Transitive	x	x	x	x	x
Active	x	x	x	x	x
(Intransitive) Positive					
Locative	only	x	x	x	x
Stative	x	x	x	-	x
Descriptive	x	x	x	x	x
Demonstrative	Positive only	Subj. only	x	-	x

Each cell in the Dagaari matrix can be filled, in turn by a submatrix of clauses or clause variants. (See the accompanying Matrix II, of Tense and Quality Transform types.) The implication here is that, tentatively, negative and tense forms are treated as contrastive types. Note, as illustrative:

ù dà zów
 'he did run'
 ù dà bí zòw
 'he did not run'
 ù nà zów

'he will run'
 ù kówn zów
 'he will-not run'

DAGAARI MATRIX II: Permitted Tense and Quality Transform Types

		Tense	
		± Past	+ Future
Positive	±	dâ 'past' dáá 'far past' zàà 'yesterday'	+ nà
Negative	±	[as above] + bá	+ kówn

Even with these differences of form, however, many investigators (like Crouch for Vagala in §1.2) would undoubtedly prefer to treat clauses marked for tense as etic variants (optional expansions) of the basic clauses--which already include, in the verb stem, signals for aspect⁴ (perfective or imperfective). Thus negative changes might be treated differently from tense. Tagmemic theory focuses on etic versus emic differences but--in spite of R. Longacre's⁵ dual structural criterion--some intermediate situations such as the negative remain doubtful. Whether this is due to the permanent indeterminate nature of the data, or to lack of adequate theory or method, is not known.

Emphasis in Dagaari leads to classes of emphatic clauses, differing as to the included tagmeme which is emphasized. Non-subject tagmemes may be emphasized in any basic clause type, or any derived by the modal and tense-or-quality clauses just discussed, by shifting the emphasized tagmeme--to a position before the subject--and adding to it kâ which in turn is preceded optionally by lá. Subject, when emphasized, is followed by lá; a nonemphatic pronoun is replaced by an emphatic one.

For Bariba, several kinds of clauses are reported, by Soutar, which have not been seen in the preliminary data concerning the basic clause types of Dagaari, Vagale, and Mbembe. (Note the causal and benefactive elements.)

For the Bariba, Soutar lists certain clause types, expanding the list with sub-matrices to show some inner-layer transformation potential for derived benefactive, reciprocal, and passive types.

⁴Imperfective is derived from perfective by a set of rules, phonologically conditioned, involving added vowel length, sometimes with r or n, and with vowel harmony.

⁵See his Grammar Discovery Procedures (The Hague: Mouton and Co.) 1964. Note some restrictions--such as in reference to concord, or agreement, where two differences do not seem to justify an emic contrast. For concord restrictions, see K.L. Pike, 'Dimensions of Grammatical Constructions,' Language, 38, 221-44, 1962.

I. Bariba Basic Clause Types -- Independent

A. Intransitive:

	Norm	Benefactive	Reciprocal-Benefactive
Norm	1	3	5
Causal	2	4	6

B. Directive:

Numbers 1 to 4 in above chart

C. Transitive:

	Norm		Passive		Reciprocal	
	Norm	Benef.	Norm	Benef.	Norm	Benef.
Norm	1	3	5	7	9	11
Causal	2	4	6	8	10	12

D. Ditransitive:

Numbers 1-5 and 9-12 in above chart

E. Stative:

F. Equative:

1. Subjective complement
2. Objective complement

II. Basic Clause Types -- Dependent

A. Introducer

These are now illustrated, giving first a detailed list of the lexical items to be used, followed by a citation paradigm with examples numbered according to the clause list, followed in turn by tagmemic formulas for these clause types.

List of Lexical Items

na - 'I'	mam - 'me'
u - 'he'	wĩ / nũm - 'him'
sa - 'we'	bũ - 'them'
ba - 'they'	
wí - 'he' emphatic	
kukè (St. kukù) - 'hide	-sia - 'causative'
kpūnā - 'lie down'	-na - 'reciprocal'
dā (St. daa) - 'go'	-ra - 'passive'
wa (St. waa) - 'see'	Tone change
nŕ (St. nŕŕ) - 'hear'	-a/-wa/-ya - 'benefactive'
wē (St. wēē) - 'hand over'	

kē (St. kēē)	- 'give'		
wéslā	- 'give back'		
bārō	- 'be sick'		
sāā	- 'to be'		
soku	- 'call'		
kō (St. koo)	- 'do'		
dwē (dwi)	- 'buy'		
gbērū	- 'farm'	taārÉ	- 'blame'
gobi	- 'money'	tōnū	- 'person'
tasu	- 'yams'	bé	- 'those'
gari	- 'words' / 'matter'	fĕku	- 'common cold'
bīī	- 'child'	sūnō	- 'chief'
yīnni	- 'master'		

Citation Paradigm

I. Independent:

A. Intransitive

1. u kukùà 'He hid'
2. u nún kukù - slā 'He made him hide'
3. ba mam kpunā (tonal morpheme for benefactive)
'they lie down for me (prostrate themselves before me)'
4. u man nūm kpunā - slā (tonal morpheme for benefactive)
'They made him lie down for me'
5. ba kukù - nā (tonal morpheme for benefactive)
'They hid for each other (from each other)'
6. u bù kukù - nā - slā (tonal morpheme for benefactive)
'He made them hide from each other'

B. Directive:

1. u gbèrù dā 'He went to farm'
2. u mam gbèrù daā - slā 'He made me go to farm'
3. u mam gbèrù daā (tonal morpheme) 'He went to farm for me'
4. u mam bù gbèrù daā - slā (tonal morpheme)
'He made him go to farm got me'

C. Transitive:

1. na bù wa 'I saw them'
2. na bù gobi wāá - slā 'I made them see (obtain) money'
3. na bù tasu wāá - wā 'I found yams for them'
4. u mam bù gobi wāá - slā (tonal morpheme)
'He caused them to find money for me'
5. tasu waarā 'Yams were found'
6. ba gari nōō - rā - slā 'they caused the words to be heard'
7. sōbūra man koō - rā (tonal morpheme) 'The work was done for me'
8. ba man gari nōō - rā - slā (tonal morpheme)
'They caused the words to be heard for me'
9. ba waa - nā 'They saw each other'

10. na bù waa - ná - slā 'I caused them to see each other'
11. ba yàbènù dwi-à - nâ (tonal morpheme)
'They bought shirts for each other'
12. na nùn wfm bíbù waa - ná - slâ (tonal morpheme)
'I caused his children to see each other for him'

D. Ditransitive:

1. u man gobi wē 'He gave me money'
2. u mam bù gobi wē - slā 'He made them give me money'
'He made me give them money'
3. u mam bù gobi wē - yâ 'He gave them money for me'
4. ba man wí tòm bé gobi wē - síâ
'They made him give those people money for me'
5. bli sun kē - rā 'A child was given to us'
6. ba tààré wē - nā 'They gave each other blame
(They blamed each other)'
7. sa bù gari wesíá - ná - slā
'We caused them to give words back to one another
(to discuss the matter)'
8. ba sun (gari) wesíá - nâ (tonal morpheme)
'They discussed the matter for us'
9. ba sum bù gari wesíá - ná - slâ (tonal morpheme)
'They made them discuss the matter for us'

E. Stative:

1. na bārō 'I am sick'
2. na fēku bārō 'I have a cold (I am cold sick)'

F. Equative:

1. u sãã sùnō 'He is chief (a chief)'
2. wí - yá sùnō 'He is the chief'
3. wí suñō - wá 'He is a chief'

II. Dependent:

A. Introducer:

1. u nē, . . . 'He said, . . .'
2. u bù s33wa 'He told them. . . .'

This material from Bariba in Dahomey seems so different from Dagaari, Vagala, and Kasem of Ghana and from the Mbembe and Degema of the lower part of Nigeria, that I re-checked, after these pages were written, with Crouch concerning Vagala. Somehow, the cultural universals of causation and benefaction would have to be expressed in them also. Had the Bariba type of data been overlooked in these other languages, or did it in fact not exist?

Here, once more, the semantic features found their expression in clause clusters (§ 2.2, or subclusters, § 2.2.5)--rather than in single clauses with extra tag-memes within the verb (i.e., as affixes) or outside the verb but within the single clause.

Compare the following Vagala set for simple normal transitive, with the corresponding causative transitive cluster and the corresponding benefactive cluster:

ù é 'kéyng

'he did this '
 ù g̀l̀l̀ ù è kéyng
 'he made him do this '
 ù é ù té n̄
 he did it gave me
 'He did it for me !
 ù wà sá 'ígyò tè ù bówl
 he came danced igyo-dance give his village
 'He danced the igyo-dance for his village!

We have, then, a major difference in "grammatical style" between the two languages. The Vagala uses certain clause clusters where the Bariba might use single or complex clauses. The Bariba, at this point, looks typologically much more like Bantu languages -- as we shall see in 1.5 for Bobangi -- than does Vagala. The structure and frequent use of clause clusters such as these of Vagala, furthermore, is one of the most striking -- and typical -- of the characteristics of many of the West African languages. We will discuss these complexes more specifically in 2.2.

1.2. Clause Contrasts. First, however, we must discuss the structural markers of contrast between simple clauses and the kinds of variation they undergo.

For Vagala, we take from Crouch a syntactic paradigm in two parts: First, a chart (or matrix) in which independent, basic clause types form the rows, whereas specific tagmemes or (for the predicate) classes of tagmemes form the columns. If a tagmeme may (or must) occur as part of one of these clause syntagmemes, it is included in the row, at a place of its most frequent or stylistically normal occurrence. Free variation of order is not signalled here. (See, however, the footnote to the chart, indicating that the order of peripheral tagmemes of manner, location, and time is not completely fixed. Often, in tagmemic formulas of this kind, arrows from one place in the string to another show free variation of position.) Contrastive change, for emphasis, had been discussed in 1.1.2. When a tagmeme is obligatory, it is preceded by a plus sign; if optional, by \pm .

Note that, in each instance, any two of these emic clause formulas differ both by their predicated (or absence of predicate in demonstrative) and by one other tagmeme (presence or absence of object, adjective complement, etc.), whether obligatory or optional. The demonstrative differs from other clauses by its lack of marginal tagmemes.

Underneath each tagmeme is given in a small subcolumn a preliminary list of the classes of items or constructions which can fill that tagmemic slot, and which, along with the function named by the tagmemic label, comprises the tagmeme as a whole -- i.e., the function set. Abbreviations for the functions include:

- NP₁ Basic noun phrase
- NP₂ Relative noun phrase
- NP₃ Locative noun phrase.
- NP₄ Possessive noun phrase
- NP₅ Coordinate noun phrase

CLAUSES

TENTATIVE TACMEMIC-NOTATION PARADIGM FOR BASIC CLAUSE TYPES IN VAGALA

	Nuclear Tagmemes				Marginal Tagmemes			
Ditrans.:	+ Subject NP ₁ (all) NP _{2a} NP _{4a} NP _{5a,b} NP ₆	† Tense* future, time, subjunct. particles	+ Dit. Pred. DitVP _{1a} 2 3	+ († I. Obj. NP _{1a,aa,d} NP _{2a} NP _{4a} NP _{5a,b} NP ₆	† Object) NP _{1a} (all) NP _{2a} NP _{4a} NP _{5a,b} NP ₆	† Manner adverb NP 2b NP 3b	† Location locative loc. noun NP 3a NP 5d	† Time temporal NP 1c NP 2c NP 3c NP 4c NP 5c
Trans.:	+ Subject same	† Tense same	+ Trans. Predicate TrVP _{1a} 2 3	† Object same	† Manner same	† Location same	† Time same	
Intrans.:	+ Subject same	† Tense same	+ Intrans. Pred. InVP _{1a} 2 3	† Loc.-Acc. NP _{3a}	† Manner same	† Location same	† Time same	
Locative:	+ Subject same	† Tense same	+ Loc. Predicate LocVP _{1a} 2 3	+ Loc.-Acc. same	† Manner same -NP _{3b}	† Location same	† Time same	
Stative 1:	+ Subject same	† Tense same	+ St ₁ Predicate StVP _{1a} 2 3		† Manner same -3b	† Location same	† Time same	
Stative 2:	+ Subject same	† Tense same	+ St ₂ Predicate du	+ Adjective adjective numeral NP _{1aa} (+num.)	† Manner same -3b	† Location same	† Time same	
Descr.:	+ Subject same	† Tense same	+ Des. Predicate DesVP _{1a} 2 3	+ Complement NP _{1a,aa,b} NP _{4a} NP _{5a,b,c,d} NP _{2a}	† Manner same -3b	† Location same	† Time same	
Demons.:	+ Subject Emphatic NP _{1a} (all) " NP _{2a} NP _{4a} NP _{5a,b}	† Demonstrative NP _{1a,aa,b} NP _{4a,b} NP _{5a,b,d} NP _{2a} locative 1a	† Tense restricted time and adverbial particles, subjunctive					

* The order of manner, location, and time tagmemes is not rigid. Some tense and time elements have co-occurrent relations not shown here.

NP ₆	List noun phrase
VP ₁	Simple verb phrase
VP ₂	Pre-modified verb phrase
VP ₃	Post-modified verb phrase

Subscript letters to the classes (e.g. NP_{1a}) indicate further relevant subsets of nouns (or verbs). These do not interest us at the moment--but such classes are important for the productive use of language. To whatever extent this tentative listing proves to be erroneous, it implies the possibility of forms not permitted by the system. This compacting display provides restrictions on occurrence of phrase type by the context of clause type. The generative power of a tagmemic presentation works, in part, by this type of predictive formula.

The + ($\pm 0 \pm 0$) form indicates that one or the other--or both--of the objects must be present; but if indirect object is present, direct object is not required, and vice versa.

Two locatives may occur in certain of these constructions--the first (locative-accompaniment) as part of the nucleus, and the second with the margin. The nuclear locative is obligatory to the locative clause; the marginal one is optional there:

ù dú Sàwlá ù màá béy
 he is-at Sawla his mother vicinity
 'He is at Sawla with his mother! (Sawla, main locative;
 with his mother, marginal locative)

In the locative and intransitive clauses, the nuclear locative (like the object of a transitive verb, or the indirect object of a ditransitive verb) is moved to the position before the verb when the clause is negative in nonfuture time (but not shifted with negative future). This characteristic, among others, leads to treatment of the first locative (or locative-accompaniment) as nuclear.

The same marker *ní* used for locative may, after some verbs, be used in the same position with meaning of accompaniment:

ù bà ù ní bówl
 he came it with village
 'He came with it to the village.'

The two come together in a sequence of locative-accompaniment and locative in:

̀n dǎng 'lá ì ní bówl
 I will go you with village
 'I will go with you to the village.'

We also give, from Crouch's data, a citation paradigm in matrix form illustrating the basic types of clauses. In order to keep to space requirements, only nuclear tagmemes are illustrated. This kind of citation display allows quick access to contrastive illustrations since no more variety of lexical selection is used than is necessary. The reader is to assume that each lexical change is caused by a change of emic structure (or occasionally by etic agreement characteristics, etc.)

Added to this matrix are a column of imperatives, and three columns of dependent clauses--for normal, purposive, and conditional.

When two inner (tagmeme) contrasts cannot be seen in a citation pair, then a

	I N D E P E N D E N T			D E P E N D E N T		
	Regular	Imperative	Regular	Purpose	Conditional	
Ditr.	IDI ù té ñ kábílà He gave me fufu.	IImDI té ñ kábílà Give me fufu!	DDI ù ñ té ñ kábílà When he gave me fufu	DPDI ú té ñ kábílà In order to give me fufu	DCDI dì ù té ñ kábílà... If he gives me fufu...	
Trans.	IT ù ló kábílà He pounded fufu.	IImT ló ká'bilá Pound fufu!	DT ù ñ ló kábílà... When he pounded fufu...	DPT ú ló ká'bilá in order to pound fufu	DCT dì ù ló kábílà... If he pounds fufu...	
Intr.	IIn ù lá yáú wá He went market.	IImIn là yáúwá Go to market!	DIn ù ñ lá yáú wá When he went to market...	DPIn ú lá yáúwá In order to go to market	DCIn dì ù lá yáú wá If he goes to market...	
Loc.	IL ù dú Sàwíá He is-at Sawla	IImL dú Sá'wíá Be-at Sawla!	DL ù ñ dú Sàwíá... When he was-at Sawla...	DPL ú dú Sá'wíá in order to be-at Sawla	DCL dì ù dú Sàwíá... If he is-at Sawla...	
Stat.1	IS ₁ ù wéyó He is good.		DS ₁ ù ñ wéyése... When he is good...		DCS ₁ dì ù wéyó... If he is good...	
Stat.2	IS ₂ ù dú wéyí He is good.		DS ₂ ù ñ dú wéyí... When he is good...	DPS ₂ ú dú wéyí in order to be good	DCS ₂ dì ù dú wéyí... If he is good...	
Descr.	IDs ù é nábòmá He is an elder.	IImDs è nábòmá Be the elder!	DDs ù ñ é nábòmá... When he was the elder...	DPS ú é nábòmá in order to be an elder	DCDs dì ù é nábòmá... If he is an elder...	
Demons.	IDm wábú nábòmá He is the elder.				DCDm dì wábú nábòmá... If he is the elder...	

further contrast may be expected, either (a) in the potential occurrence of optional expansions (the optional occurrence of a tagmeme--say, object--which may occur in a more extended sample of the one clause but which may not occur in the other); or (b) in differences of potential for transformation to another clause type (or in differences, that is, in their potential for coming in same cells in matrix multiplication), or (c) in differences in occurrence of the clauses, as wholes, in still higher-level slots--as, for example, in the slot for answer to a question versus reply to a statement, etc. Relevant emic differences include not only the differences of tagmemes within a construction, but also differences of the clauses, as wholes, comprising restrictions as to higher units within which the clauses may themselves be found. (Or, one may say, differences of internal and external distribution are both relevant; or emic contrasts include features drawn from different hierarchical levels.)

Specifically,

ù té n kàbflà
'he gave me fufu-food'

contrasts with

tén ká'bfílà
'Give me fufu-food'

not only by the lack of subject of the imperative (and by tone) but also by the fact that 'Give me fufu-food' but not 'He gave me fufu-food' can come in the context:

Comment	Reply
té n ká'bfílà	màá té í
'Give me fufu-food'	'I will not give (to) you'

Tagmemic theory requires that attention be given to such questions. It does not allow one to ignore, permanently, the significance of etic versus emic units, constructions, or levels--i.e., of contrast as against variation--at any point in the system.

1.3. Clause Variants. We turn, therefore, from the study of contrastive clause types to a discussion of types of variation within clauses of West African Niger-Congo languages. Several types occur: (a) optional presence of nuclear or marginal tagmemes, (b) optional orders of tagmemes, (c) optional kinds of fillers for tagmeme slots, and variant forms conditioned by occurrence in certain larger structures.

1.3.1. Variation by Presence of Nuclear Tagmemes. In the formulas of the first Vagala matrix, above, the diagnostic locative tagmeme is marked as optional in the nucleus of intransitive clauses. One can say not only

ù lángò
'he went'

but also

ù lá yaú'wá
'he went market'

The diagnostic locative-accompaniment tagmeme (manifested only by noun phrase NP_{3a}) plays its part in contrasting intransitive with transitive (whose optional object tagmeme has a different set of noun phrase manifestations). Whereas the optional

presence of absence of the nuclear locative tagmeme of Vagala leads to free variants of a construction, the obligatory omission in Twi of the second of two pronoun objects (see § 1.1.1) leads to conditional gaps in the systematic pattern of ditransitive clauses. So, too, does the nonpermitted definite object after indirect object.

1.3.2. Variation by Optional and Marginal Tagmemes. On the other hand, the same Vagala matrix shows that manner, location, and time tagmemes are all optionally present with any of the basic clause types except the demonstrative. Thus they are not diagnostically useful to separate the ditransitive from transitive, intransitive, locative, stative, or descriptive (but it does help separate these, as a class, from the demonstrative). Since these tagmemes, relative to the class containing them, are both optional and non-diagnostic, they are treated as marginal. Compare:

Transitive:

Manner: yàá ló mǎrfǎ kéyng
we shot gun thus

Location: ...dǐ gyà ló fǎng'fǎn ù nyùú mǎa
and then hit soap her head all
'... and then worked up a soap lather all over her
head.'

Time: kúná díy ù sògmǎ zínǎa
things ate his corn today

Descriptive:

Location: ñ fǎ é nézé'ying né ñ bówl bífyñl
I past was man-big my village inside
'I used to be an important man in my village.'

Other languages have different lists of optional tagmemes following the nucleus: Dagaari is reported with location, time, degree, manner--and instrumental--accompaniment. (Contrast, for the latter, discussion of lack of basic-clause instrumental for Twi, § 1.1.1). For Igede: adverbial, onomatopoeic (ideophones), time, and perhaps others. Degema: manner, location, time. Bariba (which, above, was very different from these other languages) agrees in having manner, location, and degree following the nucleus; but allows cause and time preceding it, and instrument or accompaniment tagmeme within it.

1.3.3. Variation by Order of Tagmemes. The early placement of the time tagmeme before the nucleus occurs in Degema and in Sisala, but as a variant from the postnuclear position. In Sisala, the placement has relevance to discourse structure (§ 3.2.1.). (See also, contrastive--emic--early placement for emphasis discussed for Vagala in § 1.2).

In addition, as footnoted in the Vagala matrix, there is, on rare occasions, another kind of variation--a free variation of order among the marginal tagmemes themselves.

We have earlier seen (§ 1.1.2) that Bariba differs substantially from our other West Africa samples, in the syntax structure of kinds of basic clause (versus clusters) it contains. So, too, it differs in relation to changes of tagmeme order within a clause.

Within Bariba causative and benefactive clauses, two or three "objects" may

(B) Occurs elsewhere

- | | | | | |
|-------|------------------------|--------|-------------|---------|
| | ± art | ± poss | + head | ± quant |
| e.g.: | à | tly | nngkpównl | bátà |
| | the | our | persons-big | three |
| | 'three of our big men' | | | |
- (iii) Noun Phrase coordinate : + NP/PronP + link + NP
as above àní 'and' as above
- | | | | |
|-------|------|-----------|------------------|
| e.g.: | | bífy 'or' | |
| | dóbó | bátà | àní pógbó bànáar |
| | men | three | and women four |
- (iv) Numeral: bátà
three
- (v) Numeral Phrase: + Num link + Num
bátà bífy bànáar
three or four
- (vi) Clause dependent : Dependent Transform of Basic Clause Matrix

1.3.6. Variation by Agreement (Concord). Variation in clauses is also caused by the mutual requiring of particular members (one subset) of a class by particular members (a subset of another class), according to some formal structural or categorical pattern of agreement or concord.

None of this kind of variation occurs in the preliminary data of the languages so far discussed. It does occur extensively, however, in the data given us by Thomas and Eileen Edmondson for the Etung materials of Nigeria, which in this respect differ markedly in typology. In the Etung, the presence of different noun classes makes sharp differences in forms of numerous tagmemes within the clause. Note, for example:

ḡkòp	èyè	ánl	yát	nñl	à-gbòé ¹	nyèn	nñí
box	his	that	one	which	it fell	I-have-seen	it
bítí	èbè	ámbl	bát	mbí	bí-gbó ¹ é	ń-yèn	mbí
stick	his	that	one	which	it-fell	I-have-seen	it

Perhaps, if we had available more syntax data on this language, further typological elements of interest would emerge.⁶

1.3.7. Variation⁷ by Occurrence in Clause Clusters. Some clause variants are conditioned by their occurrence as a serial (or secondary, non-first) member of a clause cluster (or clause series).

A close-knit series of clauses functions as a unit cluster within the sentence

⁶In morphology, Etung has concord systems reminiscent of the more extensive Bantu concord. We shall in § 1.5 turn to published Bantu data to show some syntactic characteristics--which in part are more like the Bariba of Dahomey than the Dagaari or Vagaia of Ghana, or even the Mbembe of Nigeria.

⁷I have been encouraged, in dealing with the distribution of clause variants, by recent descriptive approaches by Robert Longacre used in dealing with Trique (Mexico) clauses, "Trique Clause and Sentence: A Study in Contrast, Variation and Distribution," *LJAL*, 32.242-52 (1966).

(§ 1.4). Within the cluster, linkages tie the clauses together. The formal⁸ linkages involve the sharing of tagmemes. Two clauses in a series containing the same subject delete the second, sharing (noncontiguously) the first. The second object, when same as the first object, is also deleted. Stewart⁹ has made these details explicit for Twi:

akoromá	nó	kyeree	akókó	nó
hawk	the	caught	chicken	the
akoromá	nó	wee	akókó	nó
hawk	the	ate	chicken	the

but

akoromá	nó	kyeree	akókó	nó	wee
hawk	the	caught	chicken	the	ate

'The hawk caught the chicken and ate it.'

The word *wee* of the last example may be seen, from one point of view, as comprising an entire serial clause, as a variant of an independent clause conditioned by coming in an emic cluster.

From a second viewpoint, the object belongs simultaneously--as a "portman-teau" tagmeme--to both clauses. This latter approach has the advantage of making it simple to discuss the "sharing" of a tagmeme (as I did a few paragraphs back) but the disadvantage of implying noncontiguous sharing of subject--or noncontiguous sharing of object.

A third view treats the cluster as a single complex unit. The advantage: The cluster, not the separate clause, is said to contain the "shared," nonrepeated, elements. The disadvantage: One cannot as easily discuss clause in relation to basic and conditioned-variant forms. I shall leave the theoretical situation here indeterminate, and utilize that particular viewpoint (or combination of viewpoints) which is momentarily useful.

The non-Africanist, however, needs to be alerted to the extremely important role that clause clusters play in these West African languages. Not only do they occur as part of the inventory of available language apparatus, but they comprise part of the system necessary for the expression of various etic concepts such as instrumental (§§ 1.1.1, 2.2.3), and become an intermediate state in the dynamics of developing new forms of grammar as we shall see presently (§ 2.2.5).

An extensive illustration of suppression of shared independent subject (but differing from Twi by the retention of pronominal subject) and object is seen in Mbembe (where Barnwell refers to the domain over which a shared element is relevant as the 'wave of reference' of that element):

ìkwànɔŋ	ðká:ba	á'sí / ò-wònà	/ ò-gwó	/ ó-níŋa	éwòr
woman	she-fetches	water	she-pours	she-drinks	she-sits seat

'The woman fetches water, pours it, drinks it, and sits down.'

The underlying sentences would be:

⁸ For semantic linkages of subclusters, see §§ 2.2.5, 1.1.1.

⁹ Op. cit.

lkwàndɔ̃	ò-ká:ba	á!sɪ
woman	fetches	water
"	ò-wòna	àʃɪ
"	pours	water
"	ò-gwo	á!ʃɪ
"	drinks	water
"	òníŋa	éwòr
"	sits	seat

The wave of reference for subject would be the entire cluster; for the object, the cluster minus the last serial clause.

Once it is clear that at least some tagmemes may be suppressed¹⁰ --or shared--in a clause cluster, we want to know the limits of this sharing. Can all peripheral tagmemes, for example, be shared? And if so, in what position do they come in the cluster?

Other variations of clause structure also occur, but I shall postpone discussion of them until § 2.2.3 (for tagmeme limits in clause clusters), § 2.2.4 (for agreement factors in clause clusters), and § 3 (for changes and restrictions caused by discourse structure).

1.4. Clause Distribution. We might well turn now from the occurrence of variants of clauses to their distribution without reference to modifications of them. Clause distribution is affected both by limits imposed by the structure of clause clusters, and by limits imposed by the structure of sentences.

Since, however, the distribution of the clause types is relevant both to the description of clauses, and to the description of clause clusters and of sentences (as contributing contrastive characteristics of the higher-level units), we shall defer discussion of clause distribution until we come to these higher units in §§ 2.2.1, 2.2.2. We only emphasize here that no unit is well described until a statement of its distribution is included.

1.5. Some Clause Components of Bobangi (Bantu). I now wish to show some of the clause types of a Bantu¹¹ language. The data on Bobangi come from work by Professor Malcolm Guthrie,¹² and are restated in collaboration with Dr. Calvin

¹⁰ A detailed description of some of these phenomena from a transformationalist viewpoint (but without the attempt of studying emic--vs. etic--differences) is seen in Kay Williamson, A Grammar of the Koikuma Dialect of Ijo, West African Language Monographs 2 (Cambridge: The University Press) 1965.

¹¹ Greenberg's classification--not accepted by all scholars--places Bantu in his section IA5D, which implies that Bantu is more closely related to Etung than to any other language within the direct purview of this report.

¹² Bantu Sentence Structure, School of Oriental and African Studies, University of London, 1961. Page references refer to this article. Preceding the page numbers, the numbers in parentheses refer to his numbered sentences on those pages.

Rensch. The choice of these data is dictated by the fact that Guthrie's brief study is one of the very few on African languages which explicitly attempts to exploit slot and class relations, and hence can be rephrased in terms which make it possible to compare it with our workshop materials.

Rensch and I suggest a simple matrix, with tagmemic formulas and a citation accompanying it, to allow one to see a restatement of some basic clause types of Bobangi which have differences in concord requirements when they are independent or embedded. The simple matrix implies a larger matrix--with accompanying specific hypothecated items (marked with asterisk). If these could be shown to be either possible or impossible--by the original author's comment, or by attempted elicitation from an informant--our derivative understanding of the system might be to some degree confirmed or corrected.

Professor Guthrie discusses a general approach to syntax, illustrating it, in part, by data from Bobangi. Even though he makes no attempt to give a complete presentation of the data--it is an 'avowedly incomplete application' of his technique (p. 16)--nevertheless they lend themselves to tentative restatement in terms of tagmemic matrices.

Even the gaps (due to his criteria for selection of somewhat isolated illustrations for an article designed to illustrate theory) are instructive in suggesting questions which an outsider would now like to ask of the author or his informants (whereas a professional scholar of Bantu would probably know these answers). Field investigation can move rapidly only when one can ask questions to test a specific hunch about systemic structure. Wrong hunches are almost as valuable as correct ones--if by their careful checking and repudiation they open the way for revised hypotheses.

The languages discussed by Guthrie in this work each include at least the following general types of sentences (p. 1):

Neutral (Independent; can initiate conversation)

Response

Question

Command

Wish

Dependent, embedded (pp. 13, 16)

Contrast between Nuclei of Neutral Clauses

Only the first of these--the neutral type--is treated for Bobangi. It divides into transitive and intransitive, and may be modified to become benefactive or causative--see the labels on the left column and top row of Matrix I.

We see that from the simple types--transitive and intransitive--can be derived either benefactive clauses or causative ones. Unanswered, however, is the question whether both benefactive and causative may simultaneously occur.

Only negative samples are given. The positive contrastive forms are unavailable--and therefore the negative signal in the verb complex (which includes the function of ka at the end of the clause) cannot be identified here. Dependent clauses are sometimes embedded within the listed clause types, with a few samples to be discussed below.

Illustrations can now be brought together in a citation paradigm to illustrate the three transitive-intransitive pairs of Matrix I (words involved are *elenge* 'youth', *elike-nde* '?', *olinga* 'to like, want', *lotomo* 'work', *ka* '?', *o-pim-a* 'to go out', *o-ten-ela* 'to cut', *mpomba* 'elder', *njete* 'trees', *o-kon-isa* 'to plant', *masangu* 'maize').

1. Transitive, simple:
elenge eliki-nde olinga lomoto ka [see (2) pp. 13, 14] 'The youth did not like the work.'
2. Intransitive, simple:
elenge eliki-nde opima ka [see (2B) p. 14] 'The youth did not go out.'
3. Transitive benefactive:
elenge eliki-nde otenela mpomba njete ka [see (2c) p. 14] 'The youth did not cut down the trees for the elder.'
4. *Intransitive benefactive:
 *(*elenge eliki-nde opimela mpomba ka*) [constructed, by analogy, from information from the chart at the bottom of p. 15]
 *('The youth did not go out for the elder.')
5. Transitive causative:
mpomba eliki-nde okonisa elenge masangu ka [see (2d) p. 14] 'The elder did not make the youth plant maize.'
6. Intransitive causative:
mpomba eliki-nde opimisa elenge ka [see (2e) p. 15] 'The elder did not make the youth go out.'

Within the cells of Matrix I we have placed symbols (quite different from those of Guthrie) to show the points of structural contrast between clauses:

The transitives differ from the intransitives (a) by a different list of verbs (so far as available illustrations go) in the transitive versus intransitive predicate slot (tP versus iP). In addition, (b) the transitive clauses each optionally (\pm) have a direct object (O_g) which functions semantically as the goal of the action of the main verb (if simple or benefactive) or of the secondary verb (if in a causative clause), whereas the intransitive clauses have no nuclear object functioning as goal of the main verb.

The benefactive clauses differ from the simple ones (a) by the affix content of the verb (-el versus zero) and (b) by the specific obligatory (+) addition of the benefactive tagmeme (B).

The causatives differ from the simple and benefactive clauses (a) by the affix content of the verb (-is versus zero or -el), (b) by addition of the causal role¹³ (the causing of someone's action, not the performing of the action itself) in the optional subject slot (S_{cau}) of the clause, and (c) by the transformation of the optional subject-as-actor tagmeme (of the simple and benefactive clauses) into an optional object-as-goal tagmeme.

¹³ Our use of role, here, is related to Guthrie's mention of 'logical subject' and 'object' in fn. 1, p. 16. Our use of labels--rather than Guthrie's letters and Roman numerals--for tagmemes and tagmemic slots allows the reader easier insight into the relations involved. Guthrie's work, however, is valuable in another fashion, in demonstrating the distributional validity of groups and sequences, by using formal labels which lack semantic overtones.

Negative Neutral Clauses	Simple	Benefactive	Causative
Transitive	(1) $\begin{matrix} + \\ [c] \end{matrix} S_{ac} + \begin{matrix} + \\ [c] \end{matrix} tP \begin{matrix} + \\ 0 \\ g \end{matrix} +ka$	(3) $\begin{matrix} + \\ [c] \end{matrix} S_{ac} + \begin{matrix} + \\ [c] \end{matrix} btP(\underline{e}) + B \begin{matrix} + \\ 0 \\ g \end{matrix} +ka$	(5) $\begin{matrix} + \\ [c] \end{matrix} S_{cau} + \begin{matrix} + \\ [c] \end{matrix} P(\underline{is}) + (\begin{matrix} + \\ 0 \\ ac \end{matrix} -0) +ka$
Intransitive	(2) $\begin{matrix} + \\ [c] \end{matrix} S_{ac} + \begin{matrix} + \\ [c] \end{matrix} iP +ka$	*(4) $\begin{matrix} + \\ [c] \end{matrix} S_{ac} + \begin{matrix} + \\ [c] \end{matrix} biP(\underline{e}) + B +ka$	(6) $\begin{matrix} + \\ [c] \end{matrix} S_{cau} + \begin{matrix} + \\ [c] \end{matrix} ciP(\underline{is}) -0 +ka$

BOBANGI MATRIX I

Negative Neutral Clauses in Bobangi, with contrastive sequences of nuclear tagmemes indicated in the cells.

Concord between Subject and Predicate

Both subject types S_{ac} , S_{cau}) share the requirement that they be marked (by prefixes) as being in concord with the second part of the predicate (not with *elikinde*, but with *loinga*, for example). It is precisely such concord, plus comparable position preceding predicate, which makes S_{ac} and S_{cau} comprise a formal class of tagmemes. These two tagmemes differ from each other, however, (a) in transform potential, (b) in role relation, and (c) in relation to the permitted occurrence of other tagmemes (e.g., O_{ac}) in the clause. The subscript [c] before $[c]O_{ac}$, and $[c]O_{cau}$, and $[c]tP(el)$, etc., symbolizes the concord requirement. The absence of such a subscript on the tagmemes O_g , O_{ac} and B, specifies that no such concord links them to the predicate. Any concord internal to a phrase would be separately symbolized when the interior structure of the phrase is itself under discussion.

A nominal phrase may fill subject, benefactive, or object slots. We deduce, as a basic formula:

$$+ [c] \text{Item}_h : \langle \text{lotomo} \rangle \pm [c] \text{Deictic} : \langle \text{lonya} \rangle \pm [c] \text{Attributive} : \langle \text{losiso} \rangle$$

for *lotomo lonya losiso* 'that other work' (p. 9).

The plus (+) symbol before the tagmemic slot called *Item* implies that it is obligatory; the subscript *h* implies that it is the head of an endocentric phrase. The colon tells us that the class filling the slot is next to be given. The pointed brackets represent the class (presumably here a noun) by a typical member *lo-tomo*. The deictic *lo-nya* 'that' and adjective (?) *lo-siso* 'other' are symbolized as in concord with it. (Contrast the concord of *elenge esiso* 'the other youth' (p. 8).) It is the control of the concord of *-siso* by *lotomo* and *elenge* which leads us to treat the latter two as head and the others as modifiers.

The separate modifiers can themselves, however, fill the subject slot without their head. On this basis Guthrie treats all three tagmemes of 'of equal status' (p. 8, fn.), and as not comprising contrastive tagmemes in the internal chain of the nominal phrase. To us, however, the concord requirements, plus difference of role (and--perhaps--the impossibility of arbitrary, meaningless change in the ordering of the three, such as *[*losiso lonya lotomo*]?) imply the presence of a zero manifestation of a dominating head in subject (or object) slot when the deictic or attributive appear to occur by themselves.

Dependent Clauses within Noun Phrases

Included in a noun phrase, attributive to its head, one may find a dependent (relative) clause. The total phrase serves as filler of an O_g tagmemic slot--and possibly other slots where noun phrases occur. In the following formula note that the verbal element of the dependent clause is in concord with its 'logical object', the preceding noun which is simultaneously head of the noun phrase, but is not in concord with the nominal following it (with no other tagmeme allowed between) as its logical subject:

$$[+ [c] \text{Item}_{hNP1g} \pm (+ [c] dtP + dS)]$$

Compare *lotomo lolakisi moninga* (p. 9) 'work-showed-friend', i.e., (work which his friend showed him.) Note that the formula shows the *Item-as-goal* is in concord with the dependent transitive predicate but not--in contrast with independent clauses--with the (dependent) subject. It is the goal item which determines the con-

cord prefix of the dependent verb (p. 16). Note, further, that the Item tagmeme is simultaneously serving in two roles--one as head of the noun phrase, and one as goal of the dependent verb; the vertical stroke in the subscript after Item symbolizes this double tagmemic function.

The entire noun phrase, however, serves as filler of the goal slot of the main clause, in the sentence: $\varepsilon\text{len}\varepsilon\ \text{eliki-nde}\ \text{olinga} [O_g : NP_{rel}]$ (lotomo lolakisi moninga) ka (see [4], p. 7) 'The youth did not like the work his friend showed him.' Here we have placed $[O_g : NP_{rel}]$ outside the parentheses to show that the role of goal has a function on two levels at once--on the level of independent clause, and separately but simultaneously with the included relative dependent clause. Note, further, as indicated by the phrase formula and made explicit by Guthrie (p. 9) that the dP and dS are mutually obligatory (+ ... + ...), but that the presence of the combination with its noun head is optional ($\pm [+ \dots + \dots]$)--but may not occur without that noun head (+ Item_{hNP}). (The $\pm [+ \dots + \dots]$ section, apart from the preceding noun which is its simultaneous head and goal, is called by Guthrie an F clause.)

A second type of dependent clause (Guthrie's type K) may also fill the O_g tagmemic slot in an independent clause. Here, again, a noun may--but is not required--to precede the included verbal element as its object:

$$\pm [+ O_g + dP_2]$$

This modal nomino-verbal phrase (for terms, see p. 16) differs from the noun phrase with attributive relative clause, in that this second dependent clause type (a) has an included predicate which is not in concord with its preceding object, and (b) hence differs at least this much in internal structure from the relative predicate; (c) has its goal optional, so that the predicate may by itself fill the object slot of the independent clause; (d) is not accompanied by a dependent subject; (e) may not, in its form containing the object, fill the subject slot of an independent clause. For this dependent clause in context, note:

$\varepsilon\text{len}\varepsilon\ \text{eliki-nde}\ \text{olinga}\ O_g : NP_{nom-vb}$ - (lotomo bomeki) ka (see [6], p. 7)

'The youth did not want to try [to] work.'

Allo-Forms--Variants--of the Independent Clause

From the examples provided us, the meaning of neith eliki-nde nor of ka can be determined. We assume that eliki-nde has some temporal significance, however, since we are told (p. 13) that if it is omitted, the sentence as a whole refers to the 'time implied in the context'--but that in such an instance the subject is obligatory, not optional as shown in Matrix I. If these interpretations of the article happen to be correct, then as an allo-construction of the independent simple transitive clause (1) of Bobangi Matrix I, above, we have:

$$\sim [+ S_{ac} - \text{Time} + tP_3 \pm O_g + \text{ka}]$$

in which tP_3 is the tP of (1) minus the temporal element mentioned. This conclusion is cast in doubt, however, by other data regarding temporal elements which lead to expansion variants of (1). Preceding S_{ac} in (1) we optionally find nambisa 'afterwards' (p. 12) as a Time tagmeme--or, instead, it may follow the O_g , and in turn be followed by an Instrument-Cause tagmeme, e.g., by naepamba 'with a knife' or (same tagmeme?) by naewala-embula 'because of the rain.'

Some Unanswered Questions

Even a study as brief as Guthrie's allows for an initial understanding of first approximations towards many basic components of a system--and suggests hypotheses for checking not only with informants in the same language, but with other closely related languages.

Some of these questions we now list:

1. Can further subdivisions of nominal phrases, or of dependent clauses, be found which can fill subject and object slots?
2. What is the explicit set of restrictions on all slots of an independent clause when it is transformed to one of the dependent clause types?
3. Can every clause type of Matrix I be transformed into a relative or into a modal dependent clause? If so, what is the total dependent matrix of clauses?
4. Do all clause types of the independent matrix have variants, like the first type, in which subject is obligatory if the pre-predicate temporal is omitted?
5. Is this an isolated kind of variant, or one of a pattern of variants in which deletion of other clause tagmemes is permitted if the behavioral context--or the dialogue context--specifies it?
6. Are such variants part of a set discourse--conditioned variants which would include reference to discourse-initiating (p. 1) versus non-initiating clause types or variants?
7. What other clause types of tagmemes need to be added to expand the matrix? (Note, for Kongo--a related language--data, later in the article: numerals in noun phrases, certain particles, special word orders (p. 17); restrictions by special lexical lists of stems, special clause complements implying indirect object, location, possession (p. 18); copula in concord with following element (p. 19); subject nomino-verbals requiring same stem morpheme as main verb; emphatic versus non-emphatic orders of tagmemes, double concord--with preceding and with following elements (p. 20); non-clause linked by hiatus with clauses--differing as to whether the pre-hiatus item does or does not have the same referent as a potential subject of the post-hiatus element, tagmeme order variants conditioned by deleted tagmemes (p. 21); parenthetic--non-concording--dependent clauses, expanded nominals, quoted questions embedded in relative clauses (p. 22); clause restrictions with copulas (pp. 23-24); equational clauses with a variety of contrasting [independent-marked versus dependent-unmarked] nominal predicates [which control concord with the accompanying nominals], with contrasting orders for emphasis pp. 25-26.)
8. Must a desiderative clause type be set up in contrast with all those of Matrix I--inasmuch as olinga 'want' contrasts with okela 'do' and opima 'go' (p. 14)?--or is this possibility already covered by handling 'want' as a main verb, with modal dependent clause as its object (see [16], p. 7 --and see discussion of dependent clauses above).
9. Can causative and benefactive be combined in the same sentence? If so, how does this modify Matrix I, both as to general possibilities of sentence types, and as to order of tagmemes within them? And can desideratives be added to such hypothetical combinations, whether to main or dependent verb, or both?

Stated in terms for checking with an informant, for example, we are curious to know how many--if any--of the following sentences are possible--or possible with

change of order; or how comparable semantic components are handled where these forms are incorrect:

(The asterisk before the parentheses means, here, that we have invented these sentences. Their tentative justification or rejection can be obtained by informant elicitation. Firm judgment, however, must rest upon finding analogous sentences in running text. This checking is comparable to the standard checking, against uncontrolled text, of morphological paradigms--but is more essential for syntactic material since biased word order in sentences is more likely to be introduced by elicitation or by translation than is biased morpheme order, or occurrence, within words.)

- a. *(ɛlɛŋɛ eliki-nde opimela mpomba ka) 'The youth did not go out for the elder'
- b. *(ɛlɛŋɛ eliki-nde opima bomaki ka) 'The youth did not go out to try'
- c. *(ɛlɛŋɛ eliki-nde olinga opima ka) 'The youth did not want to try'
- d. *(ɛlɛŋɛ eliki-nde olinga otenela mpomba njete ka) 'The youth did not want to cut down the trees for the elder'
- e. *(ɛlɛŋɛ eliki-nde olinga opimela mpomba ka) 'The youth did not want to go out for the elder'
- f. *(mpomba eliki-nde olinga okonisa ɛlɛŋɛ masangu ka) 'The elder did not want to make the youth plant maize'
- g. *(mpomba eliki-nde olinga opimisa ɛlɛŋɛ ka) 'The elder did not want to make the youth go out'
- h. *(mpomba eliki-nde okonisa olingisa ɛlɛŋɛ masangu ka) 'The elder did not make the youth want to plant maize'
- i. *(mpomba eliki-nde olingisa opimisa ɛlɛŋɛ) 'The elder did not make the youth want to go out'
- j. *(mpomba eliki-nde opimisa ɛlɛŋɛ olingisa) 'The elder did not make the youth go out, wanting to'
- k. *(mpomba eliki-nde olinga opimisa bomaki ɛlɛŋɛ ka) 'The elder did not want to make the youth try to plant'
- l. *(mpomba eliki-nde olinga ɛlɛŋɛ okonisa olingisa masangu ka) 'The elder did not want to make the youth want to plant maize'

In comparing, now, this Bantu material with Niger-Congo languages studied in West Africa, I would point out the Bobangi benefactive and causative components in the verb, which lead to clause structures quite different from those reported for--say--Vagala and Dagaari (of Ghana) or Mbembe (of Nigeria). The Bariba (of Dahomey) comes closer, typologically, to the Bobangi in this respect, with benefactive and causative suffixes.

1.6. Some Clause Components of Hausa (Chad, Afroasiatic). Miss Gisela Kappler has attempted to abstract some of the data needed for our particular typologi-

cal interests from Abraham¹⁴ and to restate it in a format which would facilitate our comparisons.

Based on Kappler's formulas, as applied to Abraham's illustrations (except where otherwise stated) but with numerous uncertainties, incomplete statements, and--perhaps--errors, we see the following clause positions and filler alternatives:

Intransitive Clause (with marginal tagmemes in parentheses):

(± Time)	± [c]Subj	+ [c]Pred _{Intr}	(± Instr.	± Modal	± Loc)
NounPh.	NPh	IntrVPh	PrepNPh	mNPh	LocN
TempPrepNPh		Asp Pr	PrepPr _{ind}	PrepNPh	LocNPh
					LocPrepNPh

Here the initial optional temporal tagmeme (with noun phrase, or noun phrase preceded by preposition and temporal marker), may alternatively come at the end of the clause (with same fillers, or with a temporal particle).

The independent subject tagmeme is in concord with the predicate personal-aspect pronoun of the predicate verbal phrase, agreeing with the pronoun as to person, number, and gender.

The predicate tagmeme is composed of the verb proper (which in part determined the basic clause type--e.g., intransitive, transitive) preceded by the person-aspect pronoun which carries the remaining functions of person (number, gender, aspect), or is composed of the aspect-pronoun by itself.

The instrumental slot is filled by prepositional noun phrase, or preposition with independent pronoun. This tagmeme may optionally occur in other positions--such as following the locative.

The modal tagmeme may be manifested by a modal noun or noun phrase, with or without certain prepositions.

The locative slot may be filled by noun, noun phrase, or prepositional noun phrase, marked for locative function. The modal and locative tagmemes may come in reverse order in respect to each other.

ná·	zó·	(Predicate containing aspect-pronoun and verb)			
'I-have	come'				
yá·	zó·	dà	rá·ná·	(with temporal prepositional noun phrase in final position)	
'He-has	come by	day'			
lyá·lín	she·hù	sún	sàuká	lá·ffya·	(with modal noun final; example from Hodge)
'Family-of	Shehu	they-have	arrived	well-being'	
dán	zákl	yá	shlgá	cíkfín	búkká (with locative phrase final; example from Kraft)
'young	lion	he-has	entered	inside-of	hut'
kán	bfyú·	má·	gáma	(with initial temporal prepositional noun phrase)	
'at	two	we-shall	finish'		

Transitive clause (nuclear tagmemes, only, shown here; marginal tagmemes in some degree similar to intransitive):

± [c]S	+ [c]P _{tr}	± IO	± O
NPh	tr VPh	ioNPh	NPh
		ioPr	oPr dep

¹⁴R. C. Abraham, *The Language of the Hausa People* (London, 1959). She uses some supplementary samples for C. T. Hodge, *An Outline of Hausa Grammar, Language Dissertation*, # 23 (1947); and Hodge and I. Umara, *Hausa, Basic Course* (Washington, 1963); C. H. Kraft, op. cit. *A Study of Hausa Syntax*, Vol. 1-3, *Hartford Studies in Linguistics* 8-10 (1963).

Subject agrees with predicate, as it does for intransitive; predicate slot has transitive-verb filler (or, as an alloconstruction, verbal noun with other co-occurrent restrictions).

Indirect object (=benefactive) tagmemic slot is filled by a marked noun phrase, or by an indirect-object pronoun. The direct object slot is filled by (noun or) noun phrase, or by a dependent object pronoun:

yá· gáyà· mátà sà·kôn dà dǎré
 'He-has told to-her [a] message at night'
 (with indirect object 'her', direct object 'message'; example from Hodge)
 ná· hàrbé· shì dà bǐndíǵà
 'I-have shot him with gun'
 (with dependent object pronoun, followed by instrumental)

Transitive-Alternate 1:

$$\begin{array}{ccccccc} \pm [c]S & + [c]P & \text{tr-1} & \pm IO & + O & & \\ & & \text{tr VPh-1} & & & \text{PrepNPh} & \\ & & & & & \text{PrepPr}_{\text{ind}} & \end{array}$$

One alternative for transitive requires that certain verb phrases (tr VPh-1) be accompanied obligatorily by a direct object tagmeme marked by a preposition:

ná· ràbú dà ítà
 'I-have left (prep) her'
 (with marked independent pronoun)

yána· rǐqé dà má·shì
 'He-is holding (prep) [a] spear'

Transitive-Alternate 2:

$$\begin{array}{ccccccc} \pm [c]S & + [c]P & \text{tr-2} & + O & & & \\ & & \text{tr VPh-2} & \text{ioNPh} & & & \\ & & & \text{ioPr} & & & \end{array}$$

A second alternative for transitive requires that certain verb phrases (VP-2) be unaccompanied by indirect object, but obligatorily accompanied by direct object with fillers of that form which would--in the basic transitive type--be indirect object:

yá· cím mà zá·kǐ
 'He-has encountered lion'
 zá·kǐ yá· tá·sám mǎsà
 '[A] lion he-has suddenly-attacked him'
 (Note ma in 'him'.)

Ditransitive Clause (nuclear tagmemes):

$$\begin{array}{ccccccc} \pm [c]S & + [c]P & \text{ditr} & + (\pm O_{\text{anim}} \pm O) & \sim \pm [c]S & + [c]P & \text{ditr} + O \\ & & \text{ditr VPh} & \begin{array}{c} N_{\text{anim}} \\ N \\ \text{Pr. dep NPh} \\ \text{Vb. N Pr. indep} \end{array} & & & \text{Pr. dep} \end{array}$$

Here Kappler sets up a clause type with a further contrastive verb-stem list (accompanied, as above, by a preceding aspect-pronoun in the verb phrase), along

with special object co-occurrence restrictions. At least one of two objects must follow the verb of the two types, the first requires an animate noun (or a dependent pronoun, or a verbal noun?), the second has noun or noun phrase, independent pronoun (varying to dependent pronoun if it directly follows the verb), or verbal noun (?):

ná· bá· shì ítá
'I-have given him it'
bàucí· tó· fé kánò gírmá
'Bauci she exceeds Kano as to size'

Under some circumstances a particle *dã* or *shé* comes between predicate and animate first object:

ná· shá·-shé· shì rúwá·
'I-have given-particle him water'

Some clauses may lack a normal verb predicate. A verbal noun phrase (including its object) may be followed optionally by an aspect-pronoun (in agreement with the object of the verbal noun) and obligatory prepositional phrase as modal complement:

dí·bár músù rúwá· yánà· dà wùyá·
drawing of for-them water it-being with difficulty
'It is difficult to draw water for them'

An equational clause:

+ [c]Subj	± Descrip.	+ [c-g]Pred	equa
NPh	NPh		
Pr _{ind}	Pr _{poss}		

Here the descriptive tagmeme may come on either side of the predicate (though shown only preceding it, in the alloconstruction given--with possessive pronoun observed in the pre-predicate position but not--in Kappler's formula--post-predicate); the descriptive noun is often translated by English adjective (see Hodge). Predicate has concord with subject (or sometimes descriptive substantive?) limited to gender; otherwise these equative verbs do not change in form--except that their verb tones differ according to the tone of the preceding noun:

màcè cé
woman is
jà·kín nán qàqánè né·
donkey this small is
yá·rá nè· dó·gwà·yé· dà sú·
boys are tall with them
'The boys are very tall.'

Clauses related to these include information questions (with added particle, and with clause-final falling tone), yes-or-no questions (differing from affirmation by clause-final tone changed to falling), commands (with special verb forms--including tone and length under certain circumstances):

kúdí· nàwà né·
money how-much is (-it)?
yá· sà·mí jà·kí

did-he	get	donkey?
dó·kì	nê·	
horse	is?	

The negative involves striking changes--differences large enough to lead Kappler to treat them as types emically different from their corresponding affirmatives. For (the various kinds of) transitive and intransitive statements, the negative tagmeme is discontinuous *ba...bá*, with the first part preceding the verb phrase, which in turn begins with special aspect-pronoun elements, which, then, determine the tone and length of the negative element preceding them. In equational clauses, the first *ba* precedes the subject tagmeme. The second *bá* usually comes at the end of the various clauses (but is absent from clauses with progressive aspect). Command clauses use *kádà* instead of *ba...bá*:

kwá·ná·	úkù	bàn	gán	shì	bá
days	three	not-have-I	seen	him	not
kádà	kà	sáyár			
don't	you	sell-it!			

From this preliminary sample, inadequate though it may be, several likenesses and differences are seen between the (Afroasiatic) Hausa and the Niger-Congo languages of West Africa.

As for likeness, both have a quite similar order of tagmemes in transitive clauses (e.g., subject, predicate, indirect object, direct object, manner, location, time (see the Vagala, above). Both have intransitive, transitive, ditransitive and equative types--though this list of possibilities may be due as much to some degree of universal¹⁵ constraints on human nature and language communication as to any other factor.

The complexity of the negative clause in its relation to the affirmative is an interesting typological parallel.

On the other hand, some striking differences appear: (1) The Hausa seems to have a much wider variety of transitive subtypes, with co-occurrence relations between a selected set of verbs and the manifesting forms of indirect and direct object. (2) Hausa has an instrumental tagmeme in its basic transitive clause. This would lessen the need for some of the special kinds--or frequency of use--of serial verbs which are so characteristic of the West African Niger-Congo languages. (3) Hausa allows two pronouns in sequence, in object positions; the lack of this freedom leads, in Niger-Congo types such as Twi, to further forced serial constructions. (4) The obligatory, intricate aspect-pronoun complex¹⁶ of the Hausa verb phrase is quite different from the usual simple verb (with pronominal prefix and tone changes) of many of the Niger-Congo languages.

¹⁵ Precisely here is one need for wider sampling of languages--a sampling forwarded a bit by this report. Once a large enough sample is available, more certain generalizations can be made.

¹⁶ See Chapter 5 for this data.

II. CLAUSE CLUSTERS IN SENTENCES

Investigations of the workshop dealt only briefly with materials concerning the sentence level as such. Studies concentrated more on clause materials, and clauses in (less-than-sentence) clusters. Nevertheless, the study of sentences proved useful. On the one hand it was needed to separate clauses and clause clusters from larger structures, and, reciprocally, it was essential for differentiating emic paragraphs and discourse from smaller units. The sentence proved to be relevant as the distributional setting for clauses, but in sequence certain sentence structures comprised paragraphs.

2.1. The Sentence as Setting for Clause Distribution. Crucial observations about Kasem sentence structure were supplied to the members of the workshop by Dr. John Callow and Mrs. Kathleen Callow. From their data, the accompanying Kasem chart may be constructed. In Kasem Chart 1, Row A lists the simple sentence as itself a unit as a whole. Row B shows the important included structural sequence of optional dependent clause (or clause cluster), then the obligatory nucleus of the sentence, which is an independent clause (or clause cluster), and last the final, optional, dependent clause (or clause cluster).

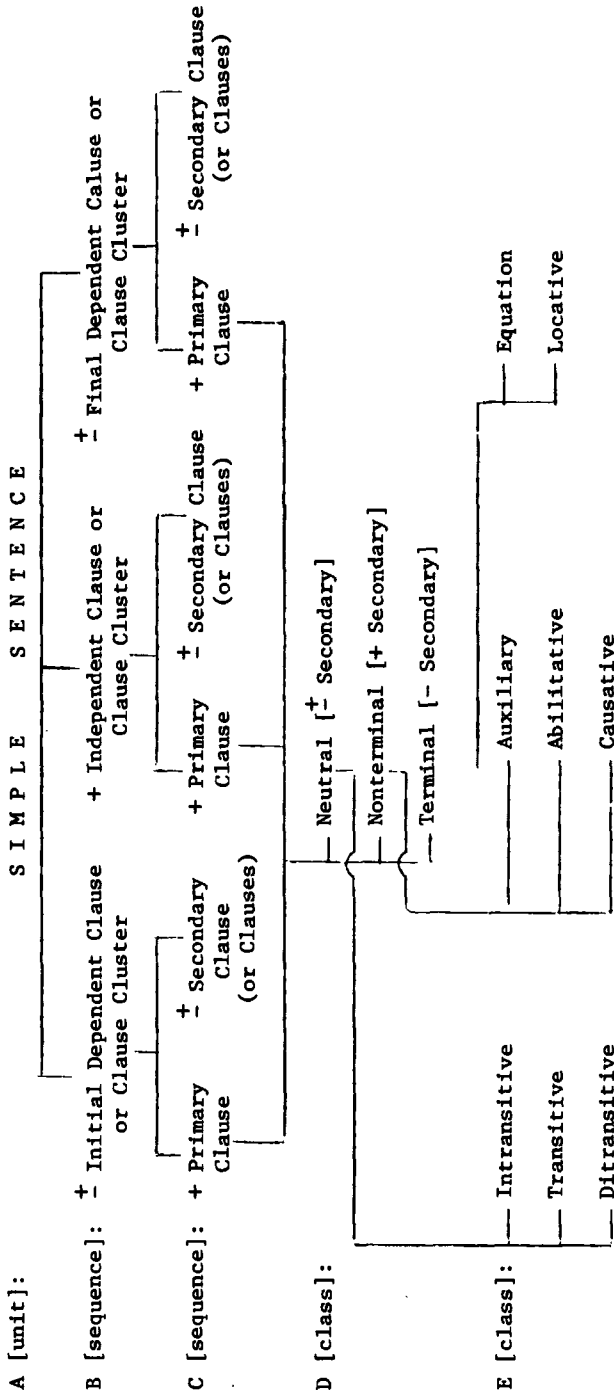
Row C shows the gross potential internal sequence with each of the slots of Row B. Each slot of the simple sentence may be filled by a sequence of clauses--a clause cluster. The first member of the cluster (whether the cluster as a whole is dependent or independent in relation to the sentence as a whole) begins with a primary clause (the nucleus of the cluster, as over against the higher-level nucleus of the sentence), and is followed (with certain restrictions to be discussed in § 2.2) by one or more secondary (serial) clauses.

The three elements of Row B are differentiated from each other not only by their place and function in the sequence within the sentence (i.e., by their external distribution), but also by their internal structure. For the latter, see Kasem Chart 2, where NP, VP are nominal (or pronominal) and verb phrase; subscript r implies 'realized' aspect, such that $VP_r = \pm w\bar{u}/b\bar{a}/t\bar{a} + V_{nf}$, in which the verb is n (on) f(uture); subscript nr implies 'n(on)r(ealized)' aspect, with $VP_{nr} + VP_f/VP_s/VP_{ip}$, in which, in turn, $VP_s = \pm m\bar{a}/m\bar{a}\bar{a}/t\bar{a} + V_f$, and V_f is f(uture) verb; and $VP_{ip} = \pm yf\bar{i}t\bar{t}\bar{a} + V_{ip}$, with V_{ip} as i(m)p(erative) verb.

Note, therefore, that these clauses differ internally by special particles, and by the range of tense and mood which is allowed in the verb phrase. Contrasts between the primary clauses of Row C of Chart 1, that is, are differentiating features of elements of Row B.

2.2. Clause Clusters (Serial Clauses). When, however, our focus shifts to the clause clusters themselves, we are interested in the relationships between the primary and secondary clauses which respectively comprise the nuclei and the serial

Kasem Chart 1



Kasem Chart 2

CONTRASTIVE NUCLEAR STRUCTURE OF PRIMARY CLAUSES

Initial			
Dependent	+ S:NP	+ nã...tú/nã	+ Pred:VP _r
Independent	+ S:NP		+ Pred:VP _{r/nr}
Final			
Dependent	+ sī/pā + S:NP		+ Pred:VP _{nr}

members (or margins) of the clusters. Row D of Kasem Chart 1 shows some of the constraints on this relation.

2.2.1. General Restrictions on Sequence Types in Clusters. Specifically, certain Kasem clauses (shown in Row E of Kasem Chart 1 to be the equative and locative clauses) cannot be followed by a secondary, serial clause when they themselves are the nucleus of the cluster (i.e., when they are primary). This set, therefore, is by the Callows called terminal, in relation to the cluster. On the contrary, however, nonterminal primary clauses are required to have a secondary clause (or clauses) following them. This set, seen in Row E, is made up of a special set of auxiliary, abilitative and causative clauses. The other type is neutral in respect to this requirement: it may be followed by a secondary clause, or it may itself close the cluster. Neutral clauses, as a class, include intransitives, transitives, and ditransitives.

These observations concerning primary clauses apply, whether in reference to the independent clauses of Row B, or the dependent¹ ones.

The Callows demonstrate that the members of the neutral, nonterminal and terminal primary clause sets differ not only by their contrastive distribution in relation to the occurrence or non-occurrence of secondary clauses with them, but also in relation to their internal structures. Members of the first set, the neutral one, have internal differences in relation to object (intransitive, none; transitive, optional objects; ditransitive, obligatory occurrence of either of two objects, or both of them), and by different verb stems. The nonterminal set likewise differs in terms of stems (auxiliary, with fourteen verbs such as *dāari* 'to do next', *kwāani* 'to do with effort and succeed', *kōwri* 'to continue doing'; abilitative, two verbs, *wāni* 'to be able', and *wāri* 'to be unable'; causative *pā* 'to give'), but differs also in that no added object, complement, or related marginal tagmemes are allowed. The terminal clauses, on the other hand, have special complements or margins as well as stem differences (equational, with nominal or adjectival complement; locational verb with a locational marginal tagmeme as well).

Note that one might have expected here a description in which the auxiliary

¹Dependent clauses, whether initial ones which may optionally precede the sentence nucleus, or final ones, have been but little studied for this report. But see some earlier work: Structure of subordinate Clause Groups in Kaaem, a paper presented by Kathleen Callow to the Fifth West African Languages Congress (April, 1965).

verbs were treated as auxiliaries to the main verb, and in the same verb phrase with them. This is the analysis implied in much of our work in § 1.

There is a difference in Kasem, however. Here the auxiliary has its subject, and the semantically main verb also has its own subject, making it simpler for the Callows to treat the subject-auxiliary combination as a clause in its own right. In order for the reader to see this facet of the structure, we add a partial syntactic paradigm. Verbs here were chosen by the Callows to demonstrate the differences between clauses. Perfect aspect is used when possible (not possible in nonfuture equative and locative, for example).

Kasem, Nonfuture, Independent Clauses:

Intrans.	ò kyúwga	'he jumped down '
Trans.	ò nyògi ná	'he drank water '
Ditrans.	ò bíri ní sǒngo kúm	'he showed me the house '
Auxil.	ò kwǎani ò kyúw	'he jumped down with an effort '
Abil.	ò wǎni ò kyúw	'he was able to jump down '
Caus.	ò pǎ ò kyúw	'he made him jump down '
Equat.	ò yí bǎbǎ	'he is/was brave '
Locat.	ò wú sǒngo ní	'he is/was in the house '

Kasem, Future Independent Clauses:

Intrans.	ò wú kyúw	'he will jump down '
Trans.	ò wú nyò ná	'he will drink water '
Ditrans.	ò wú bíri ní sǒngo kúm	'he will show me the house '
Auxil.	ò wú kwǎani ò kyúw	'he will jump down with an effort '
Abil.	ò wú wǎni ò kyúw	'he will be able to jump down '
Caus.	ò wú pǎ ò kyúw	'he will make him jump down '
Equat.	ò wú tà yí bǎbǎ	'he will be brave '
Locat.	ò wú tà wí sǒngo ní	'he will be in the house '

Kasem, Consecutive Independent Clauses:

Intrans.	ò mā kyúw	'and he jumped down '
Trans.	ò mā nyò ná	'and he drank water '
Ditrans.	ò mā bíri ní sǒngo kúm	'and he showed me the house '
Auxil.	ò mā kwǎani ò kyúw	'and he jumped down with an effort '
Abil.	ò mā wǎni ò kyúw	'and he was able to jump down '
Caus.	ò mā pǎ ò kyúw	'and he made him jump down '
Equat.	ò mā yí bǎbǎ	'and he was brave '
Locat.	ò mā wú sǒngo ní	'and he was in the house '

Kasem, Imperative Independent Clauses:

Intrans.	ò kyúw	'he should jump down '
Trans.	ò nyò ná	'he should drink water '
Ditrans.	ò bíri ní sǒngo kúm	'he should show me the house '
Auxil.	ò kwǎani ò kyúw	'he should make an effort to jump down '

Abil.	- - -	
Caus.	ò pā ò kyúw	'he should make him jump down'
Equat.	ò tà yī bābīa	'he should be brave'
Locat.	ò tà wū sōngo nī	'he should remain in the house'
Kasem, Initial Dependent Clauses:		
Intrans.	ò nà kyúwgi tú...	'when he jumped down...'
Trans.	ò nà nyògi ná tú...	'when he had drunk some water...'
Ditrans.	ò nà bīri nī sōngo kúm tú...	'when he had showed me the house'
Auxil.	ò nà kwāani ò kyúw tú...	'when he had jumped down with an effort'
Abil.	ò nà wāni ò kyúw tú...	'when he had been able to jump down'
Caus.	ò nà pē ò kyúw tú...	'when he had made him jump down'
Equat.	ò nà yī bābīa tú...	'as he is brave...'
Locat.	ò nà wū sōngo nī tú...	'when he was in the house...'
Kasem, Final Dependent Clauses:		
Intrans.	...sī ò kyúw	'to jump down'
Trans.	...sī ò nyò ná	'to drink water'
Ditrans.	...sī ò bīri nī sōngo kúm	'to show me the house'
Auxil.	...sī ò kwāani ò kyúw	'to make an effort to jump down'
Abil.	...sī ò wāni ò kyúw	'to be able to jump down'
Caus.	...sī ò pā ò kyúw	'to make him jump down'
Equat.	...sī ò tà yī bābīa	'to be brave'
Locat.	...sī ò tà wū sōngo nī	'to remain in the house'

2.22. Specific Restrictions on Sequence Types in Clusters. Studies were started to specify in more detail the particular clause types from language to language which might be primary or secondary--or tertiary, etc.--in the clusters.

Jacobs, for Bimoba, prepared for me a co-occurrence matrix, with clause types listed at the left, and the same types along the top. If the clause in a column could follow a clause indicated by a row, a check was put in the cell at the intersection. Preliminary results--see accompanying Bimoba Matrix--showed: (1) That introducer clauses could not occur as the first of a cluster (note that all cells are empty in fifth row but not in fifth column). (2) The stative clause could precede only an equative or impersonal clause; it could not follow itself or an introducer clause; stative plus equative is rare, (3) An equative clause could not follow itself. (4) Impersonal clauses entered into a cluster as first or as second member, but in restricted clause environments (as shown on the chart) or (as found later) occasionally after other clause types provided the subject was itself impersonal.

Co-Occurrence Matrix of Bimoba Clauses in Clusters

Secondary Clause	Intrans. ₂	Trans. ₂	Ditrans. ₂	Equat. ₂	Introducer ₂	Stat. ₂	Impers. ₂
Primary Clause							
Intransitive ₁	x	x	x	x	x	x	-
Transitive ₁	x	x	x	x	x	x	-
Ditransitive ₁	x	x	x	x	x	x	-
Equative ₁	x	x	x	-	x	x	-
Introducer ₁	-	-	-	-	-	-	-
Stative ₁	-	-	-	-	x	-	x
Impersonal ₁	-	-	-	-	-	x	x

In addition, Jacobs specified a number of general considerations relating to clause clusters: (1) When the cluster threatened to become too long (exact length not specified), with too many clauses in it, it would be broken into two. (2) If spoken so slowly that two breath groups were involved, the series would be broken into two clusters. (3) If any one verb were accompanied by too many phrases, the containing clause was not followed by further members of a cluster. (4) Some further clauses with impersonals occurred if adverbials were present.

On the other hand, fast speech, especially when there was shared object (plus shared subject), often led to joining clauses in a cluster. Similarly, when two verbs seemed to be involved in representing a single action, these also were often built into a unit cluster (see instrumental in § 1.1.1 and see § 2.2.3).

Kennedy, meanwhile, had been developing his description of Dagaari clauses with special reference to their contrast, variation, and distribution. For the latter, he likewise prepared a matrix showing co-occurrence restrictions on clause distribution within clusters. His preliminary matrix--which see²--indicated a regularity and lack of restriction for intransitive, transitive, ditransitive, locative, stative, and descriptive. Each could be first in a cluster and each could be second. The demonstrative, on the other hand, did not appear in either position, in series with these others.³

² I have changed the order in which he listed them to parallel more closely that of Jacobs.

³ Kennedy suggests further restrictions of distribution in relation to some special clause sequences, involving benefactive, desiderative, and comparative, and following auxiliary. It is not clear to me from his data, however, how these would be related to clause subclusters--see § 2.2.5. A complete distributional statement must await further research.

Co-Occurrence Matrix of Dagaari Clauses in Clusters

Secondary Clause:	Intran.	Trans.	Ditr.	Loc.	Stat.	Des.	Dem.
Primary Clause:							
Intransitive	x	x	x	x	x	x	-
Transitive	x	x	x	x	x	x	-
Ditransitive	x	x	x	x	x	x	-
Locative	x	x	x	x	x	x	-
Stative	x	x	x	x	x	x	-
Descriptive	x	x	x	x	x	x	-
Demonstrative	-	-	-	-	-	-	-

A much more extensive study of distribution of clauses in clusters is now underway by Kathleen Callow, with two developments beyond the work of Jacobs and Kennedy: (1) She adds to a Kasem matrix those clause types which are nonterminal (see reference to material in § 2.2.1 above), and certain others which--perhaps--are derived. (2) She is obtaining from Jacobs and Kennedy similarly-arranged extended matrices, going beyond their early work in Bimoba and Dagaari, and is thereby able to make comparison of important likenesses and differences between the three of them. (Kasem, for example, has much less freedom of occurrence of clause types--only intransitive, transitive, ditransitive occur reciprocally in both first and second positions--than does Dagaari.)

2.2.3. Restrictions on Tagmemes within Clause Clusters. In §1.3.7 we saw that for most⁴ of the languages of West Africa the subject of the second (or third, etc.) clause must be deleted when it is the first subject of the first clause of a cluster. A repeated object in a clause cluster is also deleted (or the two clauses of the sequence may be said to share the retained subject or object).

Once this phenomenon was clearly in view, I wanted to know what happened to other tagmemes of the second clause of a cluster. What would happen to the tagmemes of location, time, degree, manner, when these (like subject or object) were the same in two clauses?

For this purpose, our most useful set of illustrations came from R. Bergman's work on Igede.

First we give a set to show the sharing of cluster-initial subject and cluster-

⁴Kasem is the one exception listed, in our materials, where a secondary clause must begin with a pronominal subject. There the identification of a clause sequence as a clause cluster is determined by other criteria, such as relation to slots in the sentence (§2.1) and agreement restrictions in the series (§2.2.4).

medial object (or, alternatively stated, deletion of like-subject and like-object from the second clause):

	<u>àhì</u> hù <u>ólò</u>	we take load
plus	<u>àhì</u> chū <u>ólò</u>	we put-on-head load
yields	<u>àhì</u> hù <u>ólò</u> chū	we take load put-on-head

Next we show that a locative peripheral tagmeme, shared by both clauses of a cluster, occurs at the end of the cluster rather than--like object--at the end of the first clause (or, one may say, the first of two like locatives is deleted).

	<u>àhì</u> hù <u>ólò</u> <u>f-íní</u>	we take load in-market
	<u>àhì</u> chū <u>ólò</u> <u>f-íní</u>	we put-on-head load in-market
	<u>àhì</u> hù <u>ólò</u> chū <u>f-íní</u>	we take load put-on-head in-market

The time tagmeme acts like the locative:

	<u>àhì</u> hù <u>ólò</u> <u>áìé</u>	we take load to-day
	<u>àhì</u> chū <u>ólò</u> <u>áìé</u>	we put-on-head load today
	<u>àhì</u> hù <u>ólò</u> chū <u>áìé</u>	we take load put-on-head today

The manner tagmeme acts similarly:

	<u>àhì</u> hù <u>ólò</u> <u>ínyínyì</u>	we take load similarly
	<u>àhì</u> chū <u>ólò</u> <u>ínyínyì</u>	we put-on-head load similarly
	<u>àhì</u> hù <u>ólò</u> chū <u>ínyínyì</u>	we take load put-on-head similarly

Compare an "adverbial" modifier:

	<u>àhì</u> hù <u>ólò</u> <u>wúu</u>	we take load all
	<u>àhì</u> chū <u>ólò</u> <u>wúu</u>	we put-on-head load all
	<u>àhì</u> hù <u>ólò</u> chū <u>wúu</u>	we take load put-on-head all

Compare, also, the onomatopoeic adverb ("ideophone"):

	òhè òhì átē hō <u>wríwrí</u>	sky cut drops do (of sprinkling)
	"It was sprinkling."	

Similarly, note the cluster-final place of an aspect particle:

S	Aux	Pred	Do	Pred	Do	Pred	Do	Asp
ō	kā	dā	ōmū	hū	áŋ	bū	ēpwā	lè
he	will	do	start	take	thing	to be	house	completive
'He will start to take the things from the house.'								

(Various possible relations still need investigation. In the text studied by Bergman, for example, no two ditransitive clauses were found in a clause cluster. Is this accidental? Or a structural restriction?)

All such special placements, and shared elements, contribute to the tying together of two or more clauses (or clause fragments) into a clause cluster which as a whole comprises a structural unit. From this point of view the cluster is a single wave, with the primary clause as its nucleus, but with no possibility of clean-cut segmenting between the clauses without distortions.

If, however, one wishes to study separate clause types in relation to their variants--the alloclauses--distributed in the (higher-layered) cluster (as in 1.3.7 in relation to contrast, variation, and distribution), then one must accept the risk of segmenting-distortion, and assign each tagmeme to one clause (or assign the tagmeme twice, once to each). This leads to a particle perspective for the units and their allos.

Wave and particle views interlock, however, if a process (wave) view is used to express "deletion" of tagmemes before the allos are described in terms of items and their arrangements (distributions). (One can, however, use a segmenting approach, describing distribution of allos of clauses without implying a dynamic change, if an unmixed item-and-arrangement approach is desired.)

That levels of a hierarchy interlock, furthermore, is demonstrated by the relation between § 1.3.7 and this one: Whereas in the former the cluster was a distributional matrix for clause allos, in the latter the clause variants significantly help to characterize the cluster. (So, also, allophones conditioned by the stress group may help to characterize the form of the stress group.)

Some tagmeme occurrences can prevent the formation of a cluster. In Vagala, for example, two or more clauses may not fuse (by the relevant deletions) to a cluster (1) if the following clause begins (a) with a time word, (b) with a tagmeme front-shifted⁵ for emphasis, (c) with a clause marked for focus (see § 3, where such a clause begins a new "paragraph"), (d) where the first clause is *du* 'to be there', (e) where the original subject is expanded or changed in any way. Other constraints are under study.

2.2.4 Agreement Restrictions within Clause Clusters. In addition to the presence of tagmemes as wholes being affected, and their placement, there are further restrictions concerning tagmeme variants. Certain allotagmas of one clause must be accompanied by the requisite allotagmas in the other clauses of the cluster. In the first clause, for example, a tense particle (e.g., *dang* 'will') may be used--but further tense markers will not occur in the following clauses of the cluster:

yáá	dand	ìyzì	dì	vòwl	dì	ná	
we	will	get-up	and	walk	and	see	
ù	dang	kpá	náú	là	té	ú	ú kpá !díy
he	will	take	cow	the	give	him	he take eat
	'He	will	give	him	the	cow	to eat.'

⁵ K. Callow states more generally, for Kasem, that in the secondary clause no preverbal tagmeme ever occurs other than the [pronominal] subject--so that in secondary clauses there is obligatory absence of the introductory and temporal tagmemes, and of all preverbal particles, including negative ones. (Negation of secondary clauses must be accomplished by dropping the cluster form, adding a conjunction, and producing a complex sentence.) Consequently, fifty percent of their observed secondary clauses were minimal--pronoun plus verb (whereas many--most--West African languages would also drop the pronoun).

Similarly, nonfuture--usually unmarked in the first clause--will continue unmarked.
See fá 'past':

kpáng òò fá lá píró dī gá ná wá gán dī bà sǎl dī
hunter used past to-go bush and go see things much and come roof and...
'The hunter used to go to the bush, see many things, and come home,
and...'

A negative cluster, likewise, does not repeat the negative marker:

wà lángé gá ná ù màá
he-not go go(out) see his mother
'He didn't go and see his mother.'

If, however, the second clause is to be negated, whereas the first clause is not, then the cluster is broken, an adversative added, and a subject (sometimes fused with negative particle) is reintroduced to the second clause:

ù lángò ká wà ù màá ná!wé
he went but he-not his mother see
'He went but he didn't see his mother.'

Contrast the double positive:

ù lángò gá ná ù màá
he went went saw his mother

On the other hand, the clauses may have mixed aspect, as perfect or imperfect:

ù èè níí dī rá tá wí'zì hópìzì bíyí màá
he perfective water and imperfective throw-to fetish day every
(did) (continuation)

'He took water and sprinkled it to the fetish daily.'

A cluster restricted--say--to future would be an alloconstruction, as one etic member of the emic construction with its varied list of potential manifesting types.

In Kasem, all clauses of a regular cluster must agree as to aspect and mode. If the series is in perfective (non-continuous) aspect, the mode will be consecutive; if aspect is imperfective (continuous) the mode throughout will be non-future.

In the Kasem occurrence of subject pronouns in secondary clauses, the pronoun must agree with the subject of the primary clause in person, number, and class; its tone is mid in non-continuous clauses, low in continuous ones.

Occasional irregular clusters occur in Kasem--as when the object (instead of the subject) of the primary clause has the same referent as the pronominal subject of the secondary clause--see 'mouse it' in the following sentence (which, normally, would be broken into parallel regular clauses or sentences):

mú ò nē tūtúwé dī gyèy dī sòli gùli yí dī nàbíyili
focus he saw mouse it sitting it stirring porridge and its tail
sin zwiñ
washing calabashes

'He saw a mouse sitting stirring porridge while its tail washed calabashes.'

2.2.5. Development of Clause Subclusters. In §1.1.1 we pointed out that in many West African languages no instrumental tagmeme could be found within the basic, single clause, but that the expression of the instrumental concept required the

usage of a clause cluster: 'He take knife cut meat that', i.e., 'He cut the meat with a knife'.

The necessity for using a complex construction for this relation forces us to attribute that relation to some part of the resultant structure. On the surface, one can see only ordinary clauses within a routine cluster. Where, then, is the relation signalled? Carried by what units?

My approach is to treat this construction as a clause subcluster having two tagmemes relevant to that layer of structure. The first is an instrumental tagmeme, the second an action tagmeme:

+ Instrumental + Utilizing-Action

Filling the instrumental slot is a special clause which has formal features accompanying the instrumental semantic implication.

Using, now, data and description worked out with Crouch for Vagala, I wish to demonstrate the difference between a (close-knit) subcluster and the more regular (loose-knit) clause clusters.

The ordinary serial cluster can be viewed as the sum of the component clauses of the cluster. The total meaning of the series is the sum of the included clauses. But in the close-knit series, the subcluster, the meaning of the series is not the sum of the meanings of the included clauses. Rather, the total function is something above and beyond that of the individual elements.

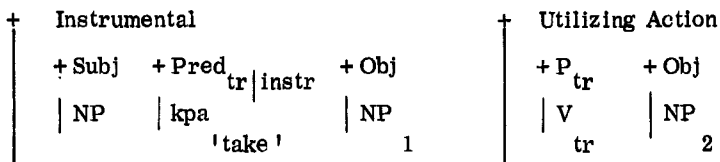
We begin with the illustration from Vagala which parallels Stewart's Twi example in 1.1.1:

ù kpá kíyzèé mòng ówl
 he took knife cut meat
 'He cut the meat with a knife.'

Here 'knife' is the direct object of 'take'. Thus 'He took knife' is a simple regular clause so far as the transitive predicate plus direct object is concerned. Similarly '[He] cut meat' is a regular secondary clause (with regular subject deletion) which includes a predicate with its regular direct object. The first clause--'take knife'--has the meaning 'instrumental'.

This instrumental function is not marked directly by any one morpheme; nor is it marked by any one particular ordered sequence of morphemes. It has to be deduced from a complex of factors. The general over-all situation (nonlinguistic setting, or setting in discourse) lets one see that the knife is the instrument of the cutting; and restrictions on the sequence show that it is, however, special. Inasmuch as the two included clauses are both transitive, however, and inasmuch as the verb kpá may occur as the first transitive verb in an ordinary sequence, it would appear that one could expect some ambiguity. We now show not only how this ambiguity can occur, but the means by which the ambiguous instrumental type is structurally differentiated from the regular sequence.

An elaborated formula for the instrumental restricted series is:



Here we have preserved, on the first level of symbolization, the special two-tagmeme close-knit series, of an instrument set forth and then utilized. Within each of the tagmemic slots (shown by vertical lines) is an included construction, tagmemically symbolized, filling the slot. For each of its slots, in turn, the fillers are given. Here note that the only verb which is allowed as a filler of the instrumental slot is 'take'. Similarly, only the transitive verb is allowed as the second of the series-- and its object must be different from the object of the instrumental member of the series.

In contrast with this, the regular series of a sequence type has various allo-constructions which allow a great deal more flexibility. We give typical samples here, involving transitive versus intransitive verb, and presence or absence of object:

Allo _{a1} :	(+S)	+ P _{tr}	+ O	+ P _{tr}	+ O
		V _{tr}	NP ₁	V _{tr}	NP ₂
Allo _{a2} :	(+S)	+ P _{tr}	+ O	+ P _{tr}	+ O
		V _{tr}	NP ₁	V _{tr}	-NP ₁
Allo _{a3} :	(+S)	+ P _{tr}	- O	+ P _{tr}	+ O
		V _{tr}		V _{tr}	NP ₂ [-NP ₁]
Allo _b :	(+S)	+ P _{intr}		+ P _{intr}	
		V _{intr}		V _{intr}	
Allo _c :	(+S)	+ P _{tr}	± O	+ P _{intr}	
		V _{tr}		V _{intr}	
Allo _d :	(+S)	+ P _{intr}		+ P _{tr}	± O
		V _{intr}		V _{tr}	

These allo-constructions are designed to show certain co-occurrence restrictions. Allo-Set a begins with a regular transitive verb and is followed by a direct object--with the direct object of the second transitive verb deleted (Allo a-2) if it is the same as that for the first. The third allo of Set a with transitive verb deletes the first direct object if it is in a sequence of sentences, such that the context implies clearly what this object is. Allo b included intransitives only; whereas c and d show transitive with intransitive, and intransitive with transitive respectively. (Further allos occur when emphasis leads to shift of certain tagmemes to the front of the construction--or when peripheral tagmemes are involved. These are not of concern to us at the moment.)

What we wish to point out is that ambiguity can occur with the instrumental and the sequence series only when the sequence is of such a type that the first verb of a sequence is kpa and the second verb is transitive with a noun-phrase object which differs from that of the object of the first noun phrase. Such a circumstance can occur

with

ù kpá b̀k̀ùwngí d̀ì èè kyáál
 he took round-stone and made [did] blood

That is, 'He "x'd" and (he) "y'd".'

The second of these clauses, as indicated by the formula, can have the first verb replaced without destroying the overall relationship of the parts--for example, 'He saw a stone and made blood'.

On the other hand, the same morpheme sequence might conceivably manifest the instrumental subcluster: 'He, with "x", "y-ed"', 'He with a stone made blood'. But in that case the kpa 'take' is replaceable by no other verb; and the second noun cannot be replaced by the first (* 'He take stone made stone') and then be deleted (* 'He take stone make') according to the formula for the regular cluster, Allo a-2; nor can the second verb be replaced by an intransitive (* 'He take stone ran') as for allo-c of the regular cluster.

The instrumental series is a close-knit subcluster of the grammatical hierarchy coming between the simple clause and a regular--loose-knit--clause cluster, and constituting a complex unit in its own right, with its own contrastive tagmemic sequence.

In our view, furthermore, these unit subclusters with their special tagmemes appear to be somehow "new" to the language. The language is in a state of transition. Here the transition is toward a more complex structure of clause clusters. Only a dynamic view of the total system can do descriptive justice to such data.

Although we have used the instrumental subcluster for illustrative purposes, Vagala seems to have various other types of subclusters currently relevant, or in process of development:

Benefactive:

In the benefactive, the verb tè 'give' works with the main verb, which precedes it. The object of tè is the benefactee of the action of the main verb. In this construction tè takes on a slightly specialized meaning which we would translate in English as 'for'. There are restrictions on the objects which tè may take in this construction:

ù wà sá ígyò tè ù bówl
 he came danced igyo-dance give his village
 'He danced the igyo dance for his village.'

Indirect Object:

Certain verbs may take two objects--a direct and an indirect object. But in terms of frequency--if the verb is tè 'give' it will usually resort to a two-verb construction--kpá 'take' plus the direct object, and tè 'give' plus the indirect object. In this construction the ditransitive verbs seen so far are limited to tè and b̀ágl̀. There are further restrictions on the objects, since the first object must be different from the second, and the classes of nouns filling the second object slot are limited:

ù kpá 'híf 'báglíf ń
 he took yam showed me

'He showed me a yam.'
 compare: ù bágíí ò híf
 he showed me yam

Accessory:

The verbs kpá 'take' and laù 'take hold of' are often used as accessory verbs to a main verb. The main verb may occur alone and take an object, but some verbs rarely occur without the accessory verb. The accessory verb precedes and takes the object (if there is one) and the main verb follows, without an object, since the object must be the same in this construction, and, therefore, not repeated:

ù kpá 'nméng dú ú 'húwr
 he took rope put-in his bag
 'He put the rope in his bag.'
 compare: ù dú 'nméng ù húwr
 he put rope his bag

Accessory motion:

Preliminary counts suggest that motion-verb combinations are more common than any other type in the language. The verb lyzì 'get up', for example, in one set of texts, occurred alone 45 times, and in combination with another verb 180 times. In many instances the meaning had become specialized or slightly changed. Another verb kààlì 'to leave' occurred alone 45 times and in combination 60 times. (It occurred alone more often in questions and commands.) When it occurred in combination it often had a slightly different or specialized meaning.

ù kpa kààlì
 he took went
 'He went.'

2.2.6. Development of Auxiliary Verbs from Clause Clusters. It should not appear surprising, in the light of the preceding section on subclusters, that auxiliary verbs--joining main verbs to make complex verb phrases--should develop out of clause clusters. Once the regular full cluster is weakened to a subcluster with special verb and special distributional restrictions, the subcluster would look like a phrase as soon as a few remaining components (e.g., object of the first-verb-turning-auxiliary) were also lost.

The weakening process, once under way, does not always stop there. The auxiliary verb may itself lose so many of those characteristics identifying it as a verb, that it is more convenient to treat it as a particle. New parts of speech, or new classes of forms may be created in this process--or a class may occur, nonuniform in type, in a transitional state.

It is this dynamic (wave⁶) component of synchronic description that I now wish to illustrate. I continue with Vagala data, and in collaboration in its presentation with Crouch.

Several sets of verbs occur: transitive, such as ló 'hit', which may optionally take an indirect object; intransitive verbs such as sòw 'sit' which are never

⁶ See, now, K. L. Pike, 'Grammar as Wave,' in Monograph Series on Languages and Linguistics, #20, Ed., E. L. Blansitt, Jr., Georgetown University, 1967.

allowed to take an object; equative eè 'is'; etc. Many of these verbs can occur in clause clusters in a fairly free manner. (These have often been called "serial verbs".) See 2.2.

Note for example:

ù sòwǵò ká'rá ní dǐ à ló ká'bfíà
 she sat chair on and imperf. pound fufu [food]
 ù éé bá kòówrǐ dǐ rà sów bà sēy
 he is their chief and imperf. sit their front
 'He is their chief and sits in front of them.'

In a sequence of two such verbs the first--the primary one--often has a specially-marked form which differentiates it from others in the sequence after it. Note, for example, that the verb sów 'sit' has low stem tone and a suffix when it occurs in the primary clause, but it is high and does not have the suffix when it occurs in a cluster:

ù sòwǵò ká'rá ní ù lé ká'rá dǐ sów
 He sat chair on he got chair and sat

Note, also, that preceding either the primary verb or the secondary verb there can be the particle rà or à 'imperfective' (see examples above).

Now, however, we note that preceding the optional imperfective marker there can be a modifying morpheme--modifying the main verb by an indication of motion.

Note, for example:

ù wà á 'ló ká'bfíà
 he came imperf. pound fufu
 ù gà á 'sów kàrá ní
 he went imperf. sit chair on

Our intent here is to call these two elements, wà and gà, verbal auxiliaries--a subset of verbs--and the primary or secondary verb as main verb. Auxiliary plus particles plus main verb, etc., make up the verb phrase, whether primary or secondary.

The problem: These two auxiliary morphemes are not allowed to have the kind of affixes which occur with the main verb of a verb phrase. With the main verb dáálf 'cook', the final i may be dropped and replaced by ô 'perfective'. When no object follows the verb, this ending is restricted to occurrence with a positive verb. If an object follows, the i form is used; or the i may be replaced by e 'perfective' if the verb is negative. (This ending is also used in various other situations, as, for example, when emphasis is on the subject. The further problems here are irrelevant to our discussion.)

Note, for example,

bà dáálf dó'zí
 they cooked soup
 bà dáálfô
 they cooked
 bà wà dáálé
 they not cook

The wà and gà auxiliaries, however, are never allowed to have these suffixes. In this sense, therefore, they are sharply different from ordinary verbs. The verb

which follows them, however, will be marked not only with one of these suffixes but all the other evidences of a main primary verb of a regular series.

In addition, four other characteristics make the *wà* and *gà* differ from main verbs: (1) They cannot be preceded by the imperfective *ra*. (2) *wà* and *gà* are not allowed to occur alone as verbs; they occur only in this position modifying a main verb. (3) The tone rules which apply to *wà* and *gà* are a different set from those which affect ordinary verbs: The tone of *wà* and *gà* may be raised by a high tone on a preceding word in nonfuture constructions; in the future constructions (including purpose clauses) *wà* and *gà* are never raised by the preceding high tone subject or particle, whereas other low verbs are. (4) Unlike other verbs discussed, whether they are primary or secondary in a cluster, in a series these auxiliaries are not allowed to have those complementing tagmemes such as location or adverb which sometimes accompany ordinary verbs.

If this were the complete picture, one might feel that it was not worthwhile calling these morphemes verbs in any sense--but that it was preferable to set them up as some kind of particle (even though in a neighboring dialect of Vagala the *wà* and *gà* act as fully regular verbs the dynamic breakdown has not gone as far in that dialect).

Our reasons for treating them as verbs: (1) In the same kind of 'auxiliary' function there are three further stages of morphemes transitional between these highly dependent morphemes and the regular independent verbs. It is convenient, therefore, to treat *wà* and *gà* as verbs--of a special auxiliary type--in the same way as we want to treat the morphemes which are in a lesser stage of breakdown in the same class. The morpheme *kùàrì* 'make, fix', for example, has a slightly greater degree of freedom. It can, as a matter of fact, come alone as a verb or as primary in a cluster. Note the following illustration:

ù kùárô
'it is-fixed'

(2) In these circumstances it can have peripheral tagmemes, as can any regular verb. When, however, *kùàrì* comes in the preposed auxiliary position where *wà* and *gà* can occur, several changes occur. It takes on a special meaning of 'again'. Note, for example:

ù kùàrì là díá
he again went home
'He went home again.'

(3) It is no longer allowed to have a perfective ending which was possible for it earlier⁷ (see illustration under [1]).

(4) In contrast to verbs after *wà* and *gà*, a verb following *kùàrì* will be treated like the secondary verb of a cluster.

One could, presumably, refuse to identify the auxiliary *kùàrì* with the separate verb *kùàrì*. If one adopted this course, then one would merely move the homophonous auxiliary *kùàrì* into the class with *wà* and *gà*. We, however, much prefer for purposes of this article, to treat the two *kùàrì* forms as still the same morpheme.

⁷There is some possibility that the loss of this ending is historically conditioned by its occurrence after a preceding *kà* which would suppress the ending. This speculation we are unable to check at this point.

We are attempting to bring forth the evidence which shows that the system is in a state of transition--and it is precisely in terms of residues such as this one that incompleteness of change can be observed. The form *kùàrì*, in our view, is in the process of becoming a particle. If all the members of the class were like *wà* and *gà*, on the other hand, we would assume that this change of the class from verb to particle were already complete.

A third stage of transition is even closer to the regular verb than is *kùàrì*. In this sub-set, also, we have just one member, *bìr* 'to turn'. With this same meaning, the verb occurs as a regular member of a cluster--either primary or secondary. When it is the primary verb, the secondary verb following has the serial form.

ù *bítò* *bà*
 he turned came
 'He came back.'
 ù *ízá* *dì* *bìr* ù *hár*
 he got up and turned his back

In these regular positions of the cluster, as main primary or secondary verb, it (like other verbs) can have the normal sets of peripheral tagmemes. Note, for example, the following:

ù *bír* *éng*
 'he turned here'
 ù *bír* *mánáng*
 'he turned quickly'

When, however, *bìr* occurs in the auxiliary tagmemic slot, then two restrictions remain: (1) No peripheral tagmemes are allowed, and (2) a special meaning is given to it--the meaning of 'again'--as, for example, in *ù bìr ngó* 'He again said'. When carrying this meaning, the word is not allowed to serve as an isolated verb--nor as a main verb in a cluster. The developing tagmemic slot has forced on it a semantic change.

We come now to an even more difficult decision. Should *wèyr* 'be able', *kútì* 'do purposely', and *fuúrì* 'do unintentionally' be treated as auxiliaries or as regular verbs? In favor of treating them as main verbs we note:

- (1) They take the perfective endings:

ù *wéytò* *ló* *ká* *bflá*
 he is-able pound fufu
 'He is-able to pound fufu [mush].'

- (2) The verb which follows them has the secondary form, not the primary form:

ù *kútò* *bìr*
 'he purposely turned'

- (3) They can stand alone:

ù *wéytò*
 'he is-able'

On the other hand, we choose to treat these as auxiliaries--or, more accurately, as just moving into the auxiliary function--for the following reasons: (1) If, in rare instances, these do stand alone, it is usually in a cultural context in which a following main verb is understood, as for example in the following situation:

Question: ̀ wéỳtò èè gúng '[Are] you able [to] do that?'
 ̀n wéỳtò 'I am-able'

(2) When occurring with another verb following them (even though the following verb is in the secondary form as just indicated above) no peripheral tagmemes are allowed to occur with them. (There can be no adverb, or locative, etc., with them.) In this respect, therefore, they have already begun to receive the specialized function which characterizes the restrictions on the preceding three subsets.

In concluding this section, therefore, we ask: How does a new part of speech develop? What kind of synchronic evidence would provide data which would show such a part of speech in process of emerging? We suggest: (1) shorter forms of items may develop with special restricted distributions. (2) Special minor rules--as for tone--may be brought to bear on them. (3) Special meanings, reflecting something about the positional usage may be added. Phonologically there may be special fused forms, pro-clitic forms, tonal characteristics. Lexically, the semantic component may be modified. Grammatically, restricted distribution is involved. The developing class--or developing part of speech if one wishes to call it that--involves the entire system.

We turn now to a further set of morphemes where it would appear that this development has run its full course. We refer specifically to a set of morphemes--in distinction to the auxiliary verbs which we have mentioned--which we can call adverbial particles: (1) These are allowed to have no peripheral tagmemes attached to them. (2) They do not occur in isolation. (3) They do not have inflection. (4) They cannot be head of a verb phrase. (5) They are involved exclusively in modifying--in some sense--the verbal phrase which they introduce (if they occur at all). (6) They are in the first position of the verbal phrase. (7) There is no obvious relationship between these and other free verbs. Nevertheless, because of the pattern of verbal sequence which is involved in the verb phrase, it would appear likely that these have a verbal source. Evidently here they have been subject to special restrictions. The source-verbs from which these may have developed are unknown or uncertain.

Having dealt with pre-verb auxiliaries and their intermediate status between particles and full verbs, we can consider a similar approach to possible post-auxiliaries. One candidate for such a position is the word hùnzl 'to fail'. (1) This verb never occurs alone; it must be preceded by another. (2) It shares any peripheral tagmemes with the preceding main verb (never has any which refer only to it.) Example:

̀ù kúár-ù hùnzl
 he fix it fail
 'He wasn't able to fix it.'

Some other verbs, e.g., t̀ng 'finish', k̀ng 'tire', p̀ng 'be satisfied' also seem to share peripheral tagmemes with the preceding verb. Examples:

̀ù pátò t̀ng
 he hoed finished
 'He finished hoeing.'
 ̀ù pátò k̀ng
 he hoed tired

'He hoed until he was tired. '
 ù dɿ¹ywǒ pǐng
 'He ate until he was satisfied. '
 full

(2) The verbs há and tá, both meaning 'throw' frequently have a slightly different meaning when occurring with other verbs:

ù gǎi ù há
 he left him throw
 'He deserted him. '
 ù lé ù há
 he got him throw
 'He saved him. '
 ù nméng ù há
 he cut-off it throw
 'He cut it off. '

(3) When used as post-auxiliaries, these verbs may have peripheral tagmemes only if these tagmemes apply both to the auxiliary and to the main verb:

ù kúar-ù húnzì dèèlà
 he fix-it fail yesterday
 'He wasn't able [yesterday] to fix it yesterday. '

So, also, tǔng 'to finish', kùng 'to become tired', pǐng 'to be satisfied':

ù páto tǔng dèèlà
 he hoed finished yesterday
 'He finished hoeing yesterday. '
 ù páto kùng dèèlà
 he hoed tired yesterday
 'He got tired hoeing yesterday. '
 ù dɿyǒ pǐng dèèlà
 he ate satisfied yesterday
 'He ate until he was satisfied yesterday. '

III. BEYOND THE SENTENCE

3.1. Sentence Clusters in Paragraphs. In §2.2 extensive data were given to show that clauses entered clusters and subclusters, forming units larger than the clause but smaller than the sentence. Now I wish to show that there is some evidence that sentences sometimes enter into formal units larger than the sentence but smaller than the narrative or discourse. The evidence, still in a very tentative form, is again drawn from the work of Crouch on Vagala.

What we wish to accomplish, therefore, is to find: (1) Some kind of formal marking of a primary independent sentence, versus a secondary sentence following this independent one. (2) We must then show that the second element of this sequence is indeed a sentence, and not merely a clause. Otherwise, the independent-dependent combination could be merely a clause cluster of the type already discussed in previous sections. (3) We then wish to show that following the independent one there can be more than one dependent sentence--there can in fact be a sequence of dependent sentences, all of them marked as other than independent. Finally (4) we wish to suggest that the relationships between the independent and the dependent elements in these paragraphs may lead to sets with semantic significance.

(1) There is a clear formal marking, in at least some¹ of the primary independent sentences versus the secondary dependent sentences. They are characterized by a contrastive complicated pattern of tone differences, occasionally supplemented by special suffixes. In some instances, for example, the dependent verb will be monosyllabic high--as for she 'carried [on head]'--whereas the independent form has the first syllable in low tone, and an added suffix *gó* with high tone. Note the following contrastive pair:

Independent:	ù	kyǎ́	níí	bà	
		she	carried	water	came
Dependent:	ù	kyí	níí	bà	
		she	carried	water	came

The independent sentence of the paragraph can often be thought of as a variety of 'topic' sentence--or one with the verb marked for focus of attention. For a contrastive pair in context, note the high tone of *yâu* 'buy' in the first sentence but also in the second sentence the low tone *yâù* 'buy' (the translation could be in past tense, by implication of the context, not by formal marking):

ù	ngó	dí	ú	yâu	híá	yáú	'wá	
	he	said	that	he	buy	yams	market	
ù	̀	lá	yáá'	wá	ù	yâù	híá	déy
	he	when	go	market	he	buy	yams	there
	'He said, "Go buy yams in the market." [And so] when he went to the market he bought yams there.'							

¹Others are ambiguous where the expected contrasts are neutralized.

The preceding illustration was chosen from Command-Response paragraph structure in order that the same verb would occur in the two parts of the paragraph and therefore the focus and out-of-focus markings could be clearly seen. In order, however, to see the focus versus out-of-focus differences where the verb changes, we use a pair of paragraphs. In the first paragraph, the primary sentence will have the verb in focus, but in the secondary sentence a verb out-of-focus; in the second paragraph the first sentence will now have the latter in focus and the former first verb will become the second, but out of focus. Note the verb *kyàg* 'wash' in focus in the first paragraph, versus *nyèr* 'sew' out of focus; and *nyèr* in focus, but *kyàg* out of focus, in the second sentence pair:

hāang là kyág wégýèzí ù gyààrí géy nyèr tàgtà
 woman the washed clothes her husband contrastive sewed shirt

But now note *nyèr* in focus, with *kyàg* out of focus:

bāal là nyér tàgtà ù hāang géy kyàg wégýèzí
 man the sewed shirt his wife contrastive washed clothes

Sometimes, as in a clause cluster, tenses are given only in the primary sentence, and not in the secondary sentence 'elaborating' the first:

ñ nýy ñ hāang né dé rá nāa ñ hāang kyág
 I and my wife emph yesterday imperfect fight my wife insult
ñ kyàgá 'bél.
 me insult one

'Yesterday I and my wife had a fight (quarrel). She insulted me
 (with a certain insult).'

(2) We next wish to show that the structure which we have called paragraph is not, in fact, merely a clause cluster of types such as we have had earlier. One might have assumed that all such paragraphs could be defined as simple clause clusters with the following rule: In the clause clusters here called paragraphs, the second clause has a subject different from the first, and therefore the second subject is retained; but in the clause clusters previously defined (§ 2.2) the second subject happens to be identical with the first and is automatically deleted. This at first appears to be an attractive rule, since relationships semantically between elements of a clause cluster are often similar to the relationships between the clauses of the sentences of a sentence cluster. Note the parallelism of structure in the following illustrations, in which the first has two sentences, but the second two clauses of which the second has deleted subject:

ù dáálí dól'zí bà díy dì pìng
 she cooked soup they ate and were satisfied
ù dáálí dól'zí dì díy dì pìng
 she cooked soup and ate and was satisfied

How, we then ask ourselves, can one prove that the first set is indeed a sequence of sentences--rather than one of clauses?

It appeared to us that the crucial differential evidence to separate these as belonging to different levels of the grammatical hierarchy would reside in studying more complex sentences. We will recall that from the Callows' material (§ 2.1) a single complex sentence may have an optional dependent clause, an obligatory independent clause, and a following optional dependent clause. Furthermore, the Callows

demonstrated that in each of these three positions within a sentence there could be a clause cluster. Note, therefore, that there is a crucial element in such a complex sentence--each component of the sentence, each dependent and independent clause complex, can be either a single clause or a clause cluster. It follows, therefore, that a complex sentence with subordinate and independent clauses is not the same as a sequence of clauses in a cluster (since it is essential that one be able to speak of several clause clusters within a single sentence which is complex in this way). If, therefore, one can show that, in the focus versus out-of-focus sequence of independent versus dependent sentences, the dependent sentence slot (or the independent slot) may be filled by a complex sentence which is itself composed of dependent and independent elements which are clause clusters, it follows that the sequence of independent, and dependent sentences must be on higher level than that of the clause clusters included within one of the major parts of one of the other of the sentences.

Notice, therefore, that in the second part of an illustration given earlier, there are dependent and independent parts to the sentence:

ù ò lá yáù'wá ù tàà hǎ déy
 he when so market he buy yams there
 'When he went to the market he bought yams there.'

Here the first dependent clause is 'when he went to the market,' and the second is 'he bought yams there.' Note, furthermore, that each of these parts can be expanded into a clause cluster:

ù ò lá yáù'wá ò ná hǎ ù yáù áhíná bà á ní díá
 he when went market and saw yams he bought some came them with house

Note that in this expansion of the sentence type there is a clause cluster in the dependent part of the sentence ('went market and saw yams') and another in the independent part ('bought some, came'). Thus it is clear that this element as a whole, including the temporal dependent clause, is not a clause sequence but a genuine complex sentence, each part of which may, in turn, include a clause cluster as already defined.

With this decision reached, it now must be clear that the full complex, including the two sentences, must be on a higher level. Note, for example, the following expanded paragraph:

ù ngó dí ú yáù hǎ yáù'wá bà à ní . ù ò lá
 he said quote he buy yams market bring them with. he when went
 yáù'wá ò ná hǎ ù yáù áhíná bà à ní 'díá
 market and saw yams he bought some came them with house
 'He said he should buy yams at the market and bring them home.
 When he went to the market and saw yams, he bought some and brought them home.'

In this expanded paragraph there are two sentences each of which includes clusters of clauses. Nevertheless the sentence sequence does not include two sentences which are on a par with each other, inasmuch as the first is marked for independence and focus, and the second is marked by the respective tonal elements as being dependent and out-of-focus.

(3) We now turn to the next element of the argument: In the dependent slot of

the paragraph there can be more than one dependent sentence. There is a parallelism between clause cluster and sentence cluster, on a higher level of the hierarchy. To the preceding illustration, for example, the following sentence may be added:

[paragraph continued]. . . ù ò héyl ú dǎ dǐ zùù ù
 he when reached his house and entered he
 kyf dǎyngèé dǐ yǐr ù bléy
 stood [in]courtyard and called his child

This third sentence is marked as being dependent. (Contrast it with the independent simple sentence:

ù kyǎgò dǐ yǐr ù bléy
 he stood and called his child)

Note, furthermore, that in this third sentence of the sequence there is a dependent and independent section, which, in accordance with the Callows' material, demands that it be treated as a complex sentence rather than as a serial clause; and note, finally, that in each part of this third complex sentence there is indeed an included clause cluster which once more shows that the levels are not the same.

(4) Just as one can have contrastive clauses (such as transitive versus intransitive versus equative) so one can have different kinds of paragraph structures. The analysis of these is not yet complete. How many there will ultimately prove to be, and the full analysis of the contrastive markings and their justification in terms of such internal components plus contrastive distribution in still larger structures, is not yet clear--and a running text cannot yet be cut into such paragraphs without residue or indeterminacy. Here we merely wish to suggest the direction in which the research is moving, and reserve analysis for later study.

In general, we will label the independent element of the paragraph the Proclamation, and the succeeding dependent sentence or sentences in series, as Commentary:

Command plus carrying out of command: (See first paragraph illustration, above.)

Request plus carrying out of a request:

ò dá nyíngǐ f kúarì ò dǎ 'té n. ù kùarì
 I imp. want you fix my house give me. he fixed
 ù dǎ 'té ú
 his house gave him

'I want you to fix my house for me. So he fixed it for him.'

Statement of intent plus carrying out of intent:

ù ngó ù ráng 'lá gà pèèzì ù mèé. ù ò
 'He said he was going to ask his father. So he
 lángé ù pèèzì ù mèé
 went and his father'

Principal action initiating sequence of actions plus subsequent action:

ù kpá kpánfó dǐ là pǎy. ù ò vólé gúúng ù
 he took axe and went, bush. he when walked long he
 wà hèyl dà-zéyng 'bél dǐ kpá kpán'íó
 came reached tree-big one and took axe
 nmèng. ù kyòwl
 chopped. it fell

Initiating action plus result of action:

ù kpá daàzí dũ níyng níyng laù daàzí là
 he took wood put in fire fire caught wood the
 dĩ fúúwn á máa tũng
 and burned them all finish

3.2. Discourse Structure. Just as a simple phrase like 'big John' can be treated as a construction wave, with John as nucleus and big as margin, so also a narrative may have nuclear sections and marginal ones. The use of such wave patterns is a universal.

When margin and nucleus are seen in discourse--whether via conversation, narration, oration--one often finds, therefore, some kind of introductory section, a basic body section--or a series of them--and some type of concluding element. These may be considered as tagmemes of a discourse construction.

3.2.1. Narrative. Within the workshop Ron Rowland first developed this area for us in Sisala. In the process of exploring clause structure he noticed that various kinds of time expressions came sometimes at the beginning of clauses, sometimes preceding the predicate, and sometimes final--or at other places in the clause. When he investigated, it became apparent that the different placements were not random, but were in part conditioned by their place in discourse--and, reciprocally, in part the placement could be viewed as a contrastive feature of the discourse pattern.

Various types of discourse differed from each other in ways barely investigated. In narrative, for example, Rowland failed to find certain words of a type common in conversation--words such as 'day before yesterday,' 'yesterday,' 'today,' 'tomorrow,' 'day after tomorrow.' Compound time words and time phrases, however, were found in narrative.

Within narrative structure a sequence of tagmemic slots seemed to occur:
 ± Preview ± Narrative Setting ± Sequential ± Focus change... ± Climax
 ± Comment by Narrator ± Summary Application

In general, each slot in this structure has respective identifying formulas composed of the kinds of variants of transitive clauses occurring there.

Preliminary formula for transitive clause in slot for narrative setting:

$$\pm \overset{f}{TP}_1 + S:NP \pm \overset{f}{Part} + Pr_{tr} \pm [?]O:NP \pm \overset{f}{LP} \pm [?]AdvP$$

Here the superscript f implies fixed order, in this discourse slot (the time phrase in that slot of narrative setting comes specifically here); subscript 1 labels the permitted subclass of noun expressions allowed there.

The sequential slot has transitive allos in a contrasting order:

$$+ S:NP + Pr_{tr} \pm [?] O:NP \pm \overset{f}{LP} \pm [?] Adv P \pm \overset{f}{Part/TP}_{1/3}$$

Here time phrases, or particles, are rare, and limited to clause final position; time phrases exclude the types mentioned for conversational style, but include those for narrative plus element T3 which is a particle fa meaning 'pre-present' --i.e., of historical relevance.

In the focus-change slot, only one sentence occurs at a time. Its structure is

similar to that of narrative except that particles do not occur between subject and predicate; and the clause may optionally end with *wa/ya* 'emphatic'.

The Climax slot has a formula like the setting slot, minus the initial time tag-meme, but adding optional final emphatic particles.

The summary slot (and the initial preview slot) has the time particle *fa--* and no other--occurring optionally between subject and predicate, or between subject and particle + predicate.

Results from Vagala research--even in a most preliminary form--reinforce, for West Africa, conviction that structures like that hinted at for Sisala may be widely found. Special preliminary markers, in addition (like 'a long time ago', for English) may open the story:

̀̀ múr té kényng
my story emph. (like) this
'This is my story.'

or
̀̀ zúm kúng là ̀̀ bá yá'zí ní bòwl
you know thing the rel-marker come salt with village
'Do you know what brought salt to the village?'

Or, in summary, close the story:

náng'dar ̀̀ kpá nngzú'má dī ná ú hng bàlā béy
spider he took sense and saved himself elephant from
'Spider saved himself from Elephant by his cleverness.'

Or, in a sign-off slot:

̀̀ túnò
I finish

3.2.2. Indirect versus Direct Discourse. In the previous section I showed that discourse could have a tagmemic structure--a grammar above the sentence level. I now add discussion of a problem in Bariba in which the cultural setting, the focus of attention, and sequence of pronominal reference are heavily interwoven in the structure of direct versus indirect discourse. The data are provided by Jean Soutar; she also collaborated closely in their presentation.

When, in Bariba, should one use direct discourse in a quotation and when in-direct? Constraints are imposed by the total discourse situation, by parts of sentence, and by choice of quotation type.

Primary, Secondary, and Tertiary Statement Patterns

We need to be able to refer to statements which contain no quotation--i.e., nonquotation, or primary² statements; to those with an included quotation--which for convenience sake may be called a secondary statement; and to those statements with a quote within a quote, which may be called tertiary. For our present purposes, a primary statement is viewed as composed of one part; the secondary of two; the tertiary of three.

The primary statement has a nonquotation filling its total area--e.g., 'The man saw the boy', etc.

The secondary statement has an initial quotation indicator, containing a verb of saying, reporting, or the like, and a second part, representing the quotation re-

²Primary and secondary are used here in reference to relation to statements. This use differs from that of Section 2.1, in reference to clauses in a clause cluster.

ported: e.g., 'He said to the man that the boy would come'. This quotation is called a first degree quotation. The quotation indicator has two diagnostic pronominal (or nominal) parts whether explicit or implicit, which identify the speaker within the quotation indicator (e.g., 'He [said]') and the audience within the indicator ('... to the boy').

The tertiary statement pattern begins with a quotation indicator, as does the secondary statement. It then, however, follows the quotation indicator with a second quotation indicator which serves simultaneously as a first degree quotation.

Following the second quotation indicator, the tertiary statement then has, in its third position, the second degree quotation:

(3) yèyá₁ na₂ na₃ n₄ nun₅ sɔ̃₆ Woru, siba₇ nɛɛ₈ nɛn₉ dumâ₁₀

ba₁₁ koo₁₂ ka₁₃ yākuru₁₄ ko₁₅ (Words--minus some names--

are numbered to key into the translation.)

'So₁ I₂ came₃ in order that I₄ tell₆ you₅ Woru, they [those

people]₇ said₈ [to me] it is my₉ horse₁₀ they₁₁ will₁₂ make₁₅

a sacrifice₁₄ with₁₃.'

This plan can now be diagrammed as in Figure I.

FIGURE I: STRUCTURE OF BARIBA STATEMENTS
SHOWING DEGREES OF QUOTATION

Non-Quotation Primary Statements	Statements with un- restricted predicate and object 'The boy will come'		
Quotation, Secondary Statements	Quotation Indicator 'He said [to you]	First Degree Quotation "I will come"'	
Tertiary Statements	Quotation Indicator 'You said [to me]	Second Quotation Indicator as First Degree Quotation "He said [to you]'	Second Degree Quotation I would come "'

We turn to the distribution of direct versus indirect speech in quotations, predictable by various criteria.

Indirect Status of Second Degree Quotations

In the third slot, that of the second degree quotation of a tertiary statement, all quotations are indirect.

(When the particle mā 'that' precedes a quote, we know--as in the English translation--that the quotation is indirect. Unfortunately, for the ease of our analysis, the mā is optional, leaving some ambiguity. Various items other than mā occasionally give hints indicating directness or indirectness of discourse.)

Alternative Forms of First Degree Quotation

In the second slot--the quotation--of a secondary statement of Figure I, direct discourse is sometimes used for the quotation, and sometimes indirect.

Off-Stage First Degree Quotations, as Indirect

In a narration, the setting of the scene before the principal action itself begins, may be called "off-stage". Quotations within such introductory off-stage parts of a narration are in indirect discourse.

On-Stage Quotations with Ranking Matrix

The main part of a discourse, including the action parts of a long discourse, are "on-stage," in contrast to the introductory (or concluding) off-stage elements. An on-stage quotation may be direct or indirect. Several factors control the choice of the indirect or direct form of a first degree on-stage quotation. One is its relation to the dramatis personae (DPs) of the quotation indicator (Q. I.) preceding it. In Matrix A, this factor is charted. The character (first, second, third, or fourth [less important], whether singular or plural) chosen by the narrator to be speaker in the quotation indicator, serves as marking one of the rows of the matrix. The character chosen by the narrator as explicit or implicit audience to the subject of the quotation indicator serves to label one of the columns. At the intersection of the relevant row and column, the cell is filled either with the symbol I, meaning 'indirect discourse will be used for the first degree quotation, after the quotation indicator'; or the cell is filled with D for direct discourse; with I/D for sometimes one and sometimes the other; or with A when the forms are expected to be permanently ambiguous; or with question mark when data are lacking.

MATRIX A: OCCURRENCE OF A FIRST DEGREE QUOTATION AS DIRECT OR INDIRECT, IN ACCORDANCE WITH THE DRAMATIS PERSONAE OF THE PRECEDING QUOTATION INDICATOR.

DPs of the Quotation Indicator	Audience in Q. I.			
	2	1	3	4
Subject of Q. I.				
2	?	I	I	I
1	I	A	I/D	I/D
3	I	I/D	?	I/D
4	I	I/D	I/D	?

The matrix has several quite unexpected characteristics: Note, first, that the rows and columns have been specially changed (permuted) from the routine order of 1, 2, 3, 4, to the order 2, 1, 3, 4. Only by this permutation is its special characteristic clearly seen--that whenever 2 (singular or plural) is involved at all in the quotation indicator, whether as speaker or audience, the succeeding quotation will be indirect. The presence (the involvement) of 2 overrides the presence of any other person. I call this a 'ranking'³ structure.

For an illustration of the 3-2 cell, note the following where the Q.I. is 'They would say [to you]' and the quotation is indirect in that cell of Matrix A (i.e., M.A.₃₂):

bén₁ tí₂ vè₃ ba₄ tunuma₅ ba₆ koo₇ bikia₈, amona₉ mba₁₀ ka₁₁ mba₁₂

ka₁₃ man₁₄ sikua₁₅

'When₂ they₃ arrived₄ they₅ themselves₁ would₅ ask₇ [you] how₈ you₁₂

buried₁₅ me₁₄ and with₁₃ what₁₁.'

On-Stage Quotations in Focus

Leaving now the quotations preceded by an indicator containing 2, we study only those quotes varying from I to D, and where the indicator has only 1, 3, or 4.

The pattern found for general conversation, on-stage, in focus is represented in Matrix B. Off-diagonal cells are all direct. The parentheses indicate infrequent forms; it is rare to have the general conversation in focus when the conversation is between the narrator (1) and people other than 2.

MATRIX B: ON-STAGE GENERAL CONVERSATION IN FOCUS

DPs of the Quotation Indicator	Audience in Q.I.		
	1	3	4
Subject			
1	A	(D)	(D)
3	(D)	?	D
4	(D)	D	?

³First pointed out in matrix form in the submorphemic (or morphemic) "formatives" of a complicated morphological structure. See K. L. Pike and B. Erickson, 'Conflated Field Structures in Potawatomi and in Arabic,' *LJAL* 30.201-12 (1964).

Note: Since this analysis was finished (covering text from seven sources, 660 quotations) a second body of text, which included approximately 1,000 quotations, was studied in the light of the hypotheses here. About fifty quotations did not fit the rules. Ten of these were commands. Four were a repeat of a quotation. Five instances of direct form occurred unexpectedly in a second degree quotation; two of these are speeches making up the important point to the story, so that emphasis or focus brought directness into the second degree slot.

Other things being equal, quotations which are written, or are true, are found in indirect form. Quotations which are oral, or fiction, are given in direct form.

For an illustration note:

kpa₁ Woru₂ na₃ ù₄ nεε₅, Sabi, sá₆ ñ₇ de₈ yam₉ mf₁₀ doo₁₁ ?

'Then₁ Woru₂ came₃ and said₅, "Sabi, aren't₇ we₆ ever₈ going₁₁ to that₁₀ place₉?' (Here the Q. I. is 'Woru said [to Sabi]';

the direct quotation is from cell M.3₃₄.)

It is unusual for one character to be in focus when it is neither the narrator (1) nor audience (2). It is usual, however, when one character is the narrator, for the narrator to be in focus (if 2 is not involved) and to speak with direct quotes; and the other to speak to him with indirect quotes. Focus is likely to be placed on a chief, if a chief and another person (3 and 4) are involved in conversation.

In the reported speech of one character to another in a given on-stage section of a discourse, on the other hand, one of those quotations (one utterance of that character) may be in focus, pinpointed within its Indirect context, and made Direct, for example, if it represents a quotation which became the source of the name of a person or place:

ba₁ nεε₂, a₃ doo₄ a₅ n₆ dā₇ dāāre₈ mf₉ yéyá₁₀ ya₁₁ ka₁₂ Dāāri₁₃ mf₁₄...
wíyá₁₅ ba₁₆ m̀₁₇ Dāāri₁₈ yeruma₁₉

'They₁ said₂, "(You₃) go₄ and stay (drop off)₈ there₉." So it₁₁ was called Danri₁₃ there₁₄...It-was-he₁₅ they₁₆ called₁₇ Danri's₁₈ oldest-son₁₉.' (Q.I. 'they said [to him]'; Quotation 3-19:Direct, quotation in focus.)

On-Stage Quotation Out of Focus

Related criteria affect unfocussed quotations on-stage. When general conversation is out-of-focus, for example, all quotations are indirect.

An incident from history, where the action is more important than the conversation represents this kind of circumstance.

yè₁ Gera₂ koo₃ tabu₄ ko₅, u₆ Sabi Nena₇ sómo₈ gəríma₉, wí₁₀ koo₁₁
tabu₁₂ ko₁₃, ù₁₄ wí₁₅ sēēmu₁₆ kē₁₇

'When₁ Gera₂ was going₃ to make₅ war₄, he₆ sent₉ a messenger₈ to Sabi Nena₇ (saying) that he₁₀ was going₁₁ to make₁₃ war₁₂, so would he₁₄ (Sabi Nena) give₁₇ him₁₅ arrows₁₆.' (Q.I.: 'Gera said to Sabi Nena'; Quotation: 10-16: Indirect, general conversation, out-of focus.)

Of several characters--but usually one of a pair--one may be out-of-focus. The character out-of-focus is quoted indirectly--whereas the character in focus would be quoted directly. In a string of direct quotations, with the string as a whole considered to be in focus, however, extra attention within the larger attention span may be achieved for one direct quotation by making the preceding quotation indirect. (Much as in an italic--emphasized--paragraph, one word may be re-set in Roman type for higher emphasis.)

Although the speech of a chief is normally quoted directly, and the reply to him directly, the following illustration reversed this to highlight the source of the place name:

(a) u₁ nεε₂ tamaa₄ u₅ koo₆ bũ₇ gura₈ ù₉ ka₁₀ doona₁₁

(b) .wǎ₁ tǎnu₂ u₃ nεε₄, Domma₅ á₆ ñ₇ dǎ₈ bu₉ mǎ₁₀ ? yéyá₁₁ ba₁₂ ka₁₃
mǎ₁₄ More₁₅

(a) 'He₁ said₂ he₃ thought₄ he₅ would₆ gather₈ them₇ and₁₁ take them away.'

(b) 'One of his₁ people₂ said₄, "When₅ did you₆ not₇ have₁₀ them₉?"'

So₁₁ they₁₂ called₁₄ (that place) More₁₅.'

(Q.I., Sentence 1.: 'He said (to his people)'; Quotation: 3-11: Indirect, on-stage, one quotation out-of-focus, reversal. Q.I., Sentence 2: 'One of his people said to him'; Quotation: 5-10, Direct, one quotation in focus.)

IV. NOUNS AND NOUN PHRASES

We have already had occasion to list some kinds of noun phrases as fillers of the subject slot of clauses (for Dagaari, in § 1.3.5) and of other slots (for Vagala, in § 1.2). We now wish to see more detail of this type, as well as the structure of the nouns themselves.

4.1 Types of Noun Phrases. For Mbembe, Barnwell gives as the most common types of nominal phrases the following (symbolized in terms of their manifesting classes rather than by their comprising tagmemes):

+ noun + (+ demonstrative ± particle): ètèn ndó! sà
meat that there

+ noun + possessive: ètèn cě
meat his

+ noun ± (± mfn:à + numeral): àndə mfn:a àfà
people about two

+ noun ± qualifier + numeral: əndə kpənápkpən àfà
person every two

Less common is a Mbembe time phrase (in appropriate clause slots) with a time word as its head, with optional expansion by a relative clause:

əwù ndó! ɛmá!kwú mā
day that which they-came here

or a prepositional phrase, with preposition plus optional noun phrase or pronoun, plus further optional noun phrase:

k ɛkwò:r k ɔsò:m
to tortoise to house
'to tortoise's house'

The most common Mbembe phrase composites are noun phrases in appositional sequence (or pronoun in apposition to a phrase, or vice versa); or with a coordinating link; or one subordinate (e.g., a relative phrase) to another.

In order to show in more detail the relation of noun phrase types to their distribution in tagmemic slots, however, we return to the Vagala material of Crouch. Classes of phrases are given here. Their distribution in clauses--with some margin of error--was indicated in the chart in § 1.2.

NP ₁	a--	± Pre-Demonstrative	+ Head	+ Numeral	+ Post-Demonstrative	+ Qualifier
		pre-demonstrative	noun pronoun	numeral	post-demonstrative	qualifier
		zál lâ mǎǎ		à bǎǎ mǎǎ		
		hen the all		the elephants all		
		'the whole hen'		'all the elephants'		

dffnf ànè là
houses two the
'the two houses'

aa--	+ Head	+ Numeral	+ Post-Demonstrative	+ Qualifier
	noun	same	same	same
	pronoun			

[bâal là] bôwl
[man the] village
'[the man's] village'

[kàlàngkú là] bór là
[peanut the] place the
'[the peanut] place'

[n] tágzí là mǎa
[my] medicine the all
'all of [my] medicine'

[ù] hàan-nánánáná bánè
[his] wives-good two
'[his] two good wives'

[l] haánà bánè nǎa
[your] wives two these
'these two wives [of yours]'

b--	+ Head	+ Demonstrative
	adverbs	same

gúng là [hng nng êe]
like that [you will do]
'how [you will do]'

gúng là [bàlà n nng dǎú ú]
how [elephant rel. will put him]
'what [elephant will do to him]'

c--	+ Pre-Demonstrative	+ Head	+ Numeral	+ Post-Demonstrative	+ Qualifier
	same	time noun	same	same	same

à sǎngà
the (that) time

sǎngà là
time the

à hól 'bél
a day one
'one day'

à hól nǎa
a day that
'that day'

d--	+ Head
	numeral

báhíná [dú 'déy]
some [are there]

[ù káhhúróz'í dú] ànfy-dànè
[his hats are] seven

[à gà kǎ] ánè
[they went left] two
'there were two left/they left two'

NP ₂	a --	+ Relative Head	+ Relator	+ Post-Demonstrative
		NP _{1a}	dep. cl.	post-demonstrative

wíí là ò dú ù zèé
 thing the rel. is its 'bottom
 'the reason for it'

ḍíá là ò kyówíé là
 house the rel. fell the
 'the house which fell'

b --	+ Relative Head	+ Relator	+ Post-Demonstrative
	NP _{1b}	dep. cl.	post-demonstrative

[yáá ná] 'gúng là nùáńg 'b'fey ò dú 'wé
 [we saw] how dog child rel. is
 '[We saw] whnt the dog's child is like.'

c --	+ Relative Head	+ Relator	+ Post-Demonstrative
	NP _{1c}	dep. cl.	post-demonstrative

à hól únglá ò bálé là
 a day the other rel. came the
 'the day the other one came'

NP ₃	a --	+ Head	+ Relator
		NP _{1a}	directional nouns

[ù zuù] níf là bffynl
 [he enter] water the inside
 '[he went] into the water'

[bà wà hèyl] kyòòwma bówl 'núá
 [they came reach] [rabblt] village mouth
 '[they reached] the entrance to [rabbit's] village'

b --	+ Head	+ Relator
	n. sub-class	directional-ní

[gí'zé wà l'yzl fangá ní
 [don't come get up] strength (with)
 '[don't get up] vigorously'

c --	+ Head	+ Relator
	NP _{1c}	directional-ní

[kòówrí nyàng f'yzô] kyòòz' ní
 [chief again got-up] morning (in)
 '[the chief got up] in the morning [as usual]'

d --	+ Head		+ Relator
		adjectives	
		[û dú] sùm nì né	directional-nf
		[it is] sweet emph.	

NP ₄	a --	+ Possessing Head...n*	+ Possessed Head
		NP _{1a} NP _{1aa}	NP _{1aa}
		kòówrì bléy [sfúwò]	ù háang nùá
		chief child [died]	His wife mouth
		'the chief's child [died]'	'his wife's mouth'

b --	+ Possessing**Head	+ Possessed Head
	locative	NP _{1aa}
		[mà zùm] déynmémèé
		[1-neg know] there road
		'[I don't know] the road of that area'

c --	+ Possessing Head	+ Possessed Head
	time noun	NP _{1aa}
		time nouns (?)
		kéré kyóózí
		tomorrow morning

d --	+ Possessing Head	+ Possessed Head
	adverb	NP _{1aa}
		[gállnggâ wà] gúng ñfèrè [féwé]
		[crow didn't] such thoughts [think]
		'crow hadn't thought like that'

*n here means repeatable without structural limit.

**The terms here are awkward. The noun-noun relation shows parallels leading to their being grouped here.

NP ₅	a --	+ Coordinate Head	+ Conn.	+ Coordinate Head	+ Conn....	+ n
		NP _{1a}	conn.	NP _{1a}	conn.	NP _{1a}
		NP _{4a}		NP _{4a}		NP _{4a}
		NP _{3a}				
		ù nfy ù háang nfy blyzf [bà díy'wó]				
		he and his wife and children they ate (something)				

únglâ ñ ná 'ú dì féyílí ngó lùgó bà sénéf síúwò níy
 the-one rel. saw her and first sald that their lover died and

únglâ ñ kpá 'bá zàn bà lâ, níy únglâ ñ kpá
 the-one rel. took them flew come dem. and the-one rel. took

díyng dì lál 'ú là...
 tail and raised her dem.

'the one who saw her (In his mirror) and first sald that their lover dled,
 the one who brought them flying (with his wings) or the one who
 had raised her from the dead by striking her with his
 tail [which one should have her]'

b --	+ Coordinate Head numeral NP _{1d}	+ Conn. conn.	+ Coordinate Head numeral NP _{1d}	+ Conn.... conn.	+ n numeral NP _{1d}
------	---	------------------	---	---------------------	------------------------------------

báníy dì bànè
 five and two
 'seven people'

c --	+ Coordinate Head temporal NP _{1c} NP _{2c} NP _{3c}	+ Conn. conn.	+ Coordinate Head temporal NP _{1c} NP _{2c} NP _{3c}	+ Conn.... conn.	+ n temporal NP _{1c} NP _{2c} NP _{3c}
------	--	------------------	--	---------------------	---

zínān níy 'kéré
 today and tomorrow

d --	+ Coordinate Head locative NP _{4b}	+ Conn. conn.	+ Coordinate Head locative NP _{4b}	+ Conn.... conn.	+ n locative NP _{4b}
------	--	------------------	--	---------------------	-------------------------------------

NP ₆	+ List Head NP _{1aa}	+ List Head NP _{1aa}	+ List Head NP _{1aa}	+ n NP _{1aa}
-----------------	----------------------------------	----------------------------------	----------------------------------	--------------------------

[dèyní ù kpá'wó rà lá, dī] wòkòzí nfy kpòwnàzí, v̀bàzí...
 then he took cont. go, and yams and yams yams...
 'He went and came upon yams [type one], and yams [type two], and
 yams [type three]...' (Here nfy is optional, and not indicated in the
 above formula.)

Bariba, which differed substantially in clause structure from these other Niger-Congo languages, has a quite similar pattern of noun phrase in subject slot:

Possessive	Noun	Adjective	Numeral	Demonstrative
nén	naà	baka	tîa	yé
my	cow	big	one	that
'that one big cow of mine'				
sùnón	dīl	baka	teè	té
chief	house	big	one	that
'that one big house of the chief's'				

(Compare, above, Vagala type NP_{1aa}.)

4.2. Development of Compound Nouns. We saw in 2.2.5 that subclusters of clauses could develop from clause sequences. Special distributional restrictions, coupled with phonological and semantic specialization, led to new complexes in a synchronic view of the dynamic system. To noun phrases a related dynamic process applies, leading to 'subclusters of nouns'--i.e., noun compounds. As was true for the clauses, these cannot easily be treated as a single, uniform structure, since the fusion is not even at every point in the system.

In order to show how this material functions, we move to Igede. The remainder of this section is quoted directly from the report of Mrs. Nancy Bergman, A Note on Degrees of Noun-Plus-Noun Fusion in Igede.

The Problem:

In Igede, certain nouns in sequence were seen to be fusing, with the fused form sometimes having a specialized meaning. Were these fused forms simply following fusion rules which were normal to syntactic phrases, or were they a more closely bound morphological unit? A practical problem was also involved: How should these noun complexes be written--as two words or one?

ùbè + útōjĩ > ùbútōjĩ 'clinic'
 room medicine

(Notice that the final vowel and tone of the first noun, ùbè 'room', completely elides.)

The Aim:

In view of the setting up of a new orthography, the aim, necessarily, was to determine the difference (if any) between two nouns which are simply following normal fusion rules and two nouns which are more closely bound together as a single unit.

The Approach and Research:

The first step was to locate the different slots in which each noun and each

fused form could occur. In other words, in what slots can ùbè 'room', útōjĩ 'medicine', and ùbútōjĩ 'clinic' be distributed? Are they found in the same slots or in different ones? This was done to determine the restrictions, if any, on the occurrences of the two forms--the single noun and the fused form. I tested each and found that there was no difference in the slots in which they occurred.

ùbè	nyāhí	dáté	ō	ɲùlā	ùbè	
room	our	different	he	to-repair	room	
'our rooms are different'			'he repaired the room'			
útōjĩ	hfigu		alùbèkèè	lá	útōjĩ	
medicine	good		white-man	to-have	medicine	
'the medicine is good'			'white men have medicine'			
ùbútōjĩ	jùwà	Íg'Élāá	hú	nyĩ	kà	ùbútōjĩ
clinic	be-there	in-that-place	to-take	child	to-go	clinic
'the clinic is over there'			'take the child to the clinic'			

The following is a list of attested forms:

Igede Noun + Noun Forms

Noun ₁	+	Noun ₂	>	Fused Form
ùbè 'room'	+	útōjĩ 'medicine'	>	ùbútōjĩ 'clinic'
Ìml 'hunger'	+	ēnyĩ 'water'	>	Ìmēnyĩ 'thirst'
ùhyè 'above, on top of'	+	èkpà 'bamboo rack' (for storage)	>	ùhyèkpà 'rack for storage'
ùbè 'room'	+	ùpú 'writing'	>	ùbùpú 'school'
òhè 'god'	+	òlùbyè 'it up above'	>	òhòlùhyè 'God'
ābwō 'hands'	+	ēlā 'matter'	>	ābwēlā 'character'
ēpwā 'house'	+	ējĩ 'ground'	>	ēpwējĩ 'village'
ùgbō 'train'	+	òlùhyè 'it up above'	>	ùgbòlùhyè 'airplane'
*ēnū 'afternoon sun'	+	útūrū 'morning'	>	ēnútūrū 'day'
Íyō 'meat'	+	ēnyĩ 'water'	>	Íyēnyĩ 'fish'
Ìhū 'year'	+	òmū ?	>	Ìhwòmū 'last year'
Ìhū 'year'	+	ēnyĩ ?	>	Ìhwényĩ 'this year'

*(ēnū, útūrū, and ēnútūrū are all time words so they have certain restrictions in the slots wherein they may occur.)

Once again, notice that in noun₁ the final vowel and tone are dropped and are completely overridden by the initial vowel and tone of the second noun.

The next step proved to be very interesting and quite helpful. A test of internal expansion was tried for each of the fused forms. In a noun + noun relationship, only nyā 'for, of (possessed by)' can occur between two nouns.

Not only do Igede speakers say:

ùbútōjĩ
room-medicine
'clinic'

but they also say:

ùbè ny(â) útōjī
 room for, of medicine
 'clinic'

without changing the meaning.

In applying this test to the other fused forms, it was discovered that some could be expanded (by nyâ) and some could not. Table 1 shows this. (The x indicates tested permitted occurrence.)

TABLE I: Expansion and Non-Expansion of Igede Fused Forms

Fused Form	± nya 'for, of'	- nya 'for, of'
ùbútōjī 'clinic'	x	
Ìmēnyī 'thirst'	x	
ùhyèkpà 'rack for storage'	x	
ùbūpū 'school'	x	
òhòlùhyè 'God'	-	x
ābwēla 'character'	-	x
ēpwēji 'village'	-	x
ùgbòlùhyè 'airplane'	-	x
ēnútūrū 'day'	-	x
Ìyēnyī 'fish'	-	x
Ìhwômú 'last year'	-	x
Ìhwényī 'this year'	-	x

Now we ask: Why this difference? What is the controlling factor here? It seemed apparent that there were differences in degrees of fusion in the Igede noun + noun relationship. Following this hypothesis, four degrees of noun fusion were set up: (a) obligatory absence of fusion, (b) optional fusion, (c) obligatory fusion₁ (with identifiable morphemes), and (d) obligatory fusion₂ (some parts unidentifiable).

(a) Obligatory absence of fusion. The loosest type of noun + noun relationship in Igede is found with certain nouns which cannot fuse and which have the obligatory particle nyâ occurring, which usually denotes a genitive relationship.

ōnyī nyâ Job	~	òjè ny(â) òlēj
child of Job		bicycle of man
'Job's child'		'the man's bicycle'

(b) Optional fusion. This type of noun + noun relationship is made up of a set of nouns which fuse but which also can be expanded without changing the meaning.

Ìmēnyī	~	Ìmì ny(â) ēnyī
hunger-water		hunger for water
'thirst'		'thirst'
ùbūpū		ùbè ny(â) ūpú
room-writing		room for writing
'school'		'school'

(c) Obligatory fusion₁. In this type of noun + noun relationship there is a very strong degree of fusion; obligatorily so, in fact. These fused forms cannot be

expanded, but the morphemes constituting the forms are still recognizable and definable by informants (see also, the preceding list for the full forms of the fusing nouns).

ābwēlā
hands-matter
'character'

ēpwējī
house-ground
'village'

There is wider divergence from the meaning of the source morphemes when there is a tighter degree of fusion. That is, when two nouns fuse, the meaning of the whole is often quite different from the meaning of the nouns as separate forms.

It was suggested that the vowels of these fused forms be considered in hope that this would give a clue to a controlling factor in optional fusion and obligatory fusion. This was done and the results are in Matrix I.

MATRIX I: Relationship of Vowels to Optional Fusion and Obligatory Fusion

Final Vowel of Noun ₁	Initial Vowel of Noun ₂	± nyâ	- nyâ
-è	ú-	x	
-l	ē-	x	
-è	è-	x	
-è	ū	x	
-è	ō-	-	x
-ô	ē-	-	x
-ā	ê-	-	x
-o	ō-	-	x
-ū	ú-	-	x
-o	ē-	-	x
-ū	ô-	-	x
-ū	é-	-	x

Of the nouns considered in this Matrix, optional fusion occurs only when the final vowel of the first noun is a front vowel. This occurs, as is seen in the upper section of the matrix, in the fused forms, which can be expanded.

Obligatory fusion occurs when the final vowel of the first noun is a central or back vowel (notice the one exception, which is front vowel plus low, back vowel; it is shown between the two main sections of the matrix). Also notice that these forms are the ones which can not be expanded.

(d) Obligatory fusion₂. Finally, the tightest degree of fusion in the Igede noun + noun relationship is considered, where:

- (i) there is no separate occurrence of the morphemes, and
- (ii) the semantics of some morphemes cannot be determined by most informants (but source in noun + noun pattern is assumed).

lhwômû
year - ?
'last year'

lhwényī
year - ?
'this year'

The informant tried to attach a meaning to ényì and ômû but he was inconsistent, particularly with ômû; and since we have not gotten any meanings from previous informants, my conclusion is that no one is really sure of the meanings any more.

This could also be an indication that change is taking place in Igede towards not only a dominance of fusion but also towards obligatory fusion. In the first three types (obligatory absence of fusion, optional fusion, and obligatory fusion), the morphemes are still recognizable and definable--but in the last type this becomes extremely difficult.

Conclusion.

My conclusion and solution to the problem, therefore is:

- (1) Types (a) and (b) are phrases and should be written as sequences of separate words.
- (2) Types (c) and (d) are compounds and should be written as single words.

4.3. Syntactic Markers Developed from Nouns. Just as independent verbs sometimes developed into restricted auxiliaries or particles (§ 2.2.6), furthermore, so regular freely-distributed nouns may develop into particles or into special word classes marking other syntactic functions. For illustrating the synchronic discovery and functional description of this dynamic state, we turn back to Vagala, with data from Crouch:

In Vagala a large list of nouns may occur with or without accompanying modifiers or other compounds of noun phrases. Note, for example, dǎ́ 'house' in the phrases:

dǎ́	là	díní	ánè	là	
house	that	house	two	those	
'that house'		'those two houses'			
dǎ́	là	ù	h	má'wé	là
house	that	he	which	built	that
'the house which he built'					

A locative element may optionally follow a noun phrase with locative-noun head (e.g., dǎ́ 'house') in locative slot; but is required in locative phrases with non-locative head (e.g., màá 'mother'). Compare the phrase after transitive verb ná 'see', ù ná ù màá là 'he saw his mother that', with a locative phrase after a verb of motion là 'go,' ù là ù màá là béy 'he went [to] his mother's vicinity'.¹ Note that the marking locative can also follow a fuller noun phrase:

h	lá	díní	ánè	là	séey
I	went	houses	two	those	front
'I went to the front of those two houses.'					

We are assuming that the locative marker is in immediate constituent relation to the rest of the phrase. Whereas the demonstrative and numerals are considered to be modifiers of the noun phrase head, the locative is considered to be in exocentric relation to the phrase as a whole, even though it is optional as seen by the preceding footnote.

¹ Unless one knows whether a verb is a transitive or intransitive, certain ambiguities may develop. Certain verbs of motion may be followed by an unmarked locative, as ù lá dǎ́ 'he went house'. The subset of unmarked locative phrases does not concern us further here.

Three observations must now be made about the list of locatives:

(a) In general this list is made up of body parts: *nùá* 'mouth', *hàrbòó* 'back', *séey* 'front', *bifynl* 'inside', *zèé* 'bottom', *báng* 'middle'.

(b) The locative marker picks up its special meaning from its tagmemic function.²

(c) In addition, however, there are two or more morphemes in the class, which have locative meanings, and serve as locative markers in the same construction but which do not occur as free nouns elsewhere. Unlike 'mouth', 'back', etc., which can occur as subjects or objects in ordinary clauses, these other morphemes are found here alone. Thus one can say that *ñ nùá rá* 'wif 'my mouth hurts' or *ù ló ñ nùá* 'it hit my mouth', but one cannot use in these positions either *ní* 'on, vicinity', or *béy* 'to, presence'. Nevertheless one finds *ñ lá dí'á là béy* 'I went house that presence (I went to the house)' with *béy*, and *ù sòwgó ká'rá là ní* 'he sat chair that vicinity (he sat on the chair)' with *ní*. We conclude, then, that there is a specialized subset of nouns, identified by the fact that most of them occur as nouns in subject and object slot. But they are a specialized subset in that they have a semantic central meaning, in general (body part) with a tagmemic overlay of meaning (direction). As members of this class, however, there are two elements to be analyzed as nouns, on the basis of analogy with the other members of the class, even though they occur here alone. The resulting assumption is that these two morphemes *béy* and *ní* should be treated as nouns with restricted distribution; and that one should be able to find them as regular nouns in some related dialects.

4.4 Irregularities Within Noun Classes as Distortion of Field. Turning now to the structure of a nominal system, we find in a large number of Niger-Congo languages a difference in stems according to vowel harmony--in which the vowels are paired into 'upper'³ (close) or 'lower' (open) sets. The upper set, under certain circumstances, determines the selection of a member of the comparable set in an accompanying word or affix.

The relations between the variant forms may be expressed by morphophonemic rules or by prosodic formulas of a Firthian type, or by rules.

For this project, however, John Callow (who had previously⁴ explored three alternatives) tested a presentation of Kasem data via matrix display. A small sample of his results are given here.

The first sample displays a simple relation between a chart of patterns of Kasem noun stems, chosen because they comprise a class ending in d, but arranged in two halves. The upper half of the chart includes stems which contain upper vowels, placed in the order the vowels would come on a vowel chart. The pattern of arrangement of the lower half of the chart as a whole is repeated, but with stems containing lower members of the paired vowels. The stem-initial consonant is irrelevant to the structural relation, and is represented by C. To the right is the word form, com-

² A very similar typological situation has long been known elsewhere. Note, from Mixtec, a similar set ('Analysis of a Mixteco Text, ' *International Journal of American Linguistics*, 1944, 10, 113-138). As in Vagals, the Mixtec data includes a couple of items ('road' for 'direction toward') which do not fit the body-part class.

³ See § 7.7 for discussion of phonetic analysis of this difference.

⁴ In 'Kasem Nominals, A Study in Analysis, ' *The Journal of West African Languages*, 1963, 2, 29-35.

posed of the respective stem shape plus the 'singular' morpheme, with allomorph /ə/ after upper-harmony stems, but the allomorph /a/ after lower harmonies.

KASEM MATRIX I: Nominal-Group C, with d-final Stems

	d-final stems				d-final stems, Sg. form		
Upper Harmony	Cid-		Cud-		Cidə		Cudə
	∅	Cəd-	Cod-	+ cen. V →	∅	Cədə	Cədə
				'singular'			
Lower Harmony	Cɪd		Cɔd-		Cɪdɑ		Cɔdɑ
	∅	Cɑd-	Cɔd-		∅	Cɑdɑ	Cɔdɑ

The ∅ signifies systemic non-occurrence, i.e., /e/ and /ɛ/ cannot occur in stems of this general shape.

No startling results come from one simple chart of this kind. But it lays the ground-work for compacting rules via matrix patterns. If, for example, the upper left were to be written as N^u-d (noun of upper harmony, final consonant) versus N^l-d, the rule N^u-d + {ə} N^u-d+ə ~ N^l-d + a points toward a device in which units become symbols of matrices--with a potential compacting value.

Secondly, when the pattern does get complicated and crisscrossing, a geometric display via matrices allows (for analyst and reader both) much faster and easier insight into the pattern. Note, for example, Callow's matrix rule for the plural. Here, however, the vowel-harmony character of the preceding matrix is assumed; capital letters of stem and affix represent either upper or lower harmonics, as the stem may dictate.

KASEM MATRIX II: Plural, Nominal Group C, Consonant-final Stems

CId-	CAɪ-	COɪ-	CUɪ-		CIdI	CAɪI	COɪI	CUɪI	}	1
CIɪ-	CAɪ-	COɪ-	CUɪ-	+ fr. V →	CIɪI	CAɪI	COɪI	CUɪI		
CIn-	CAɪ-	COɪ-	CUɪ-		CInI	CAɪI	COɪI	CUɪI		
CIŋ-	CAŋ-	COŋ-	CUŋ-		CI/ĩ	CE	CwE	CwI/ĩ	}	2
CIg-	CAG-	COg-	CUG-	CI	CE	CwE	CwI	}		
					4		3			
					6		5		6	

By use of the braces, pairs of sub-groups can be shown: (1) The set of stems ending in alveolar consonants; these have no variants in the plural; versus (2) stems ending in velar consonant; the consonant is lost in plural. (3) Stems ending (a) in velar consonants and (b) containing rounded vowels; the vowel is replaced by /w/; versus (4) stems ending in front or central vowel; the vowel is lost. (5) Stems (a) ending in velar consonants, (b) containing low vowels a, o (central or back); the plural allomorph is the low front vowel (in open or close harmony); versus (6) stems (a) ending in velar consonant but (b) with high vowel; the plural allomorph is the

high front vowel. (7) Stems (a) ending in velar nasal consonant; (b) included in previously-mentioned set (6) (i.e., with high vowel); the suffix vowel alternates freely from oral to nasal quality; versus (8) stems (a) ending in velar stop, and (b) included in (5) and (6) above; no further criterion; hence those paired members of (7) and (8) are ambiguous except when (in 7) the freely-variant nasal vowel differentiates them.

Some Kasem examples:

bide	'wall'	bidi	'walls'
juŋa	'hand, arm'	ju/jɪ	'hands, arms'
dige	'room'	di	'rooms'
bəkədə	'boy'	bəkedi	'boys'
bəge	'beam'	be	'beams'
yaga	'market'	ye	'markets'
kodə	'voice'	kodi	'voices'
coŋe	'path'	cwe	'paths'
koga	'back'	kwe	'backs'
tulə	'granary'	tuli	'granaries'
zoŋa	'calabash'	zwi/ɪ	'calabashes'

The total structure of such a system of relations may be considered as a field, or subfield. Regular groupings lead to a regular field structure. Irregularities, such as these of Kasem, may be viewed as distortions of the regular field. A more complicated matrix structuring is seen in the verbs.

4.5. Noun Concord. In the preceding section we saw that noun classes differ in some Niger-Congo languages, according to their forms in singular versus plural, determined by the shape of stem, shape of the singular versus plural suffixes, and morphophonemic fusion rules within the word.

4.5.1 Ranking in Singular-Plural Prefix Pairs. When, now, we turn to the Etung of the Bantoid⁵ group of West Africa, we find not only singular-plural stem and affix differences, but two further extensive phenomena: (1) The concord-agreement between the noun and other words in the immediate noun phrase, and between the noun and some other tagmemes in the clause; and (2) a system--well-known for Bantu--in which (a) some particular prefix--or 'formative'⁶--(e.g., /e/), used for singular, forms a pair with a corresponding prefix (e.g., /bi/) used for plural with that same stem; whereas (b) on a different stem, the same prefix used earlier for plural may now appear as marker for the singular, now paired with a different prefix to mark the plural of this second stem; (c) The morphophonemic changes or suppletive replacements (or correlative formatives of a concord set) undergone by any one prefix throughout the concord patterns is the same whether it applies to its

⁵ See Greenberg's Class IA5d, as in Introduction, above. David W. Crabb, in *Ikoid Bantu Languages of Ogoja, Part I* (Cambridge, 1965), asserts with more detailed data that the Etoid group is part of the Bantu family.

⁶ I use the term formative when I wish to emphasize that there is identity of phonemic shape, but when I do not wish to commit myself to morphemic identity in the classical sense of morpheme as a relative stable form-meaning composite. Thus, the same formative can be either singular or plural.

use as singular or its use as plural, or whether paired with one or more shapes for different stems respectively.⁷

The following analysis and presentation of the Etung concord is prepared in collaboration with Mrs. Eileen Edmonson.

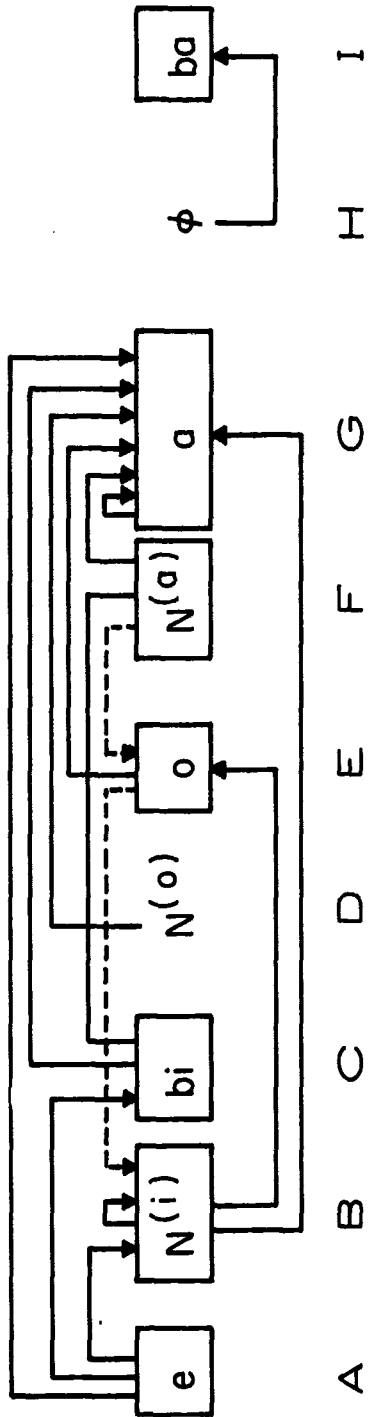
A striking insight of Edmonson added a further characteristic to the list of those already mentioned: (d) There are patterned constraints (a ranking) on the permitted pairings of prefix shapes: Some prefixes are allowed to occur much more freely than others; and the occurrence-possibility forms a 'ranking' series such that--to some degree--if the first prefix pairs with the second (in singular to plural relation), or with the third, or fourth, then the second may be expected to pair with the third and fourth, while the third may be expected to pair with the fourth. The system is not as clean-cut and regular as such a model implies, however, so the data are presented in Etung Figure 1.

Arrows connect the prefixes--with the arrow head indicating the plural form of the pair. Arrows above the line refer to countable nouns, which may be found with numerals in the plural. The dotted shaft shows movement from right to left in the chart--with only two pairs, both involving *o*. An arrow completely over a prefix indicates that certain stems use the same prefix in singular and in plural. Arrows beneath the prefixes have nonmodified plurals as indicated--but when accompanied by numerals, the plural words use the prefix which otherwise would be singular. Certain mass nouns do not occur in numerical plural contexts; the contrast between singular and plural is neutralized; a prefix which occurs with a set of these nouns is surrounded by a box in the figure.

A crucial question: What controls the ranking order--and the gaps? The vowels from left to right in Figure 1 (from A to I) divide roughly into two halves--the vowels /i/ and /e/ which are obviously front versus the vowels /o/ and /a/ which, in contrast to /i/ and /e/, may be called back. The ranking movement from singular to plural is in general from front toward a position farther back. There are some departures from this condition, as /e/ outranking /i/, and as /o/ is involved in the only instance of a back vowel singular paired with a front vowel plural. The pair { \emptyset } and /ba/ are outside the basic system, used only with certain loans.

A second problem involves the identification of the vowel coloring of the three homophonous nasal prefixes. In this instance, the vowel color is found in other elements of the concord series. In Etung Table I, rows are labelled from A to I (from Figure 1), but the order has been changed to bring closer together concurring sets which share various tonal, vocalic, and consonantal characteristics.

⁷Note that the phonologically-alternate manifestations of the formative must be treated in the concord series, whether or not the formative is considered as the same morpheme both as singular and as plural.



Etung Figure 1

ETUNG: TABLE I

Concording Sentence	Noun 'X'	his	that	one	which	it-fell	I-have seen	it
Noun Class								
D 'wife'	̀nkáé	òwě	áńò	yót	̀nńò	à-gbòé'	ń-yèn	yê
B 'box'	̀nkóp	èyě	áńí	yát	̀nńí	à-gbòé'	ń-yèn	ńńí
H 'bucket'	póklt	èyě	áńí	yát	̀nńí	à-gbòé'	ń-yèn	ńńí
A 'yam'	èyù	èjê	ánjì	ját	ńjì	é-gbó'é	ń-yèn	ńjì
C 'stick'	bítí	èbê	ámò	bát	mbí	bí-gbó'é	ń-yèn	mbí
E 'broom'	òfák	òbê	ámò	bát	mbí	ó-gbó'é	ń-yèn	mbí
F 'pestle'	̀ncók	ámê	ámà	mát	mmá	ím-gbó'é	ń-yèn	mmá
G 'needle'	àgà	ámê	ámà	mát	mmá	á-gbó'é	ń-yèn	mmá
I 'buckets'	bàpóklt	ámê	ámà	---	mmá	á-gbó'é	ń-yèn	mmá

Note, in the first row (D) that the vowel /o/ occurs in the second, third, fourth, and fifth columns--and implies the /o/ color to the simple nasal /n/ in the first column. Row F, on the other hand, has /a/ in the comparable places of the same columns, and in Column 8 as well, giving /a/ color to prefix /n/ of F. In Row B, /i/ occurs in Columns 3, 5, 8 (with front /e/ ̀n 2).

Other phonetic elements--or the front-back contrast recurring--enter deeply into the structure here, or in related data. Discussion of them must wait for a fuller paper.

This much, however, has alerted us to watch for source of these phenomena, or reflexes of them, as we study related languages.

V. VERBS

A crucial problem in describing verb structures of some of the Niger-Congo languages of West Africa lies in the control which the prefix complex exerts over the shape of the verb as a whole, combined with an intricate fusion of elements within the prefix itself. Into a monosyllabic prefix are jammed clues to a variety of tenses (or aspects), modes, persons, and contrasts for positive versus negative. I shall choose two sets of data from the workshop in order to highlight, in turn, problems of vowel fusion (in Abua), and tone spans (in Etung). Then I shall add discussion of some comparable problems of an Afroasiatic language (Hausa) of this general geographical area.

5.1. Vowel Fusion in Matrix Display. Ian and Amelia Gardner have provided us with data on the structure of some fifteen prefix forms of Abua. Matrix 1 lines up the data in order to bring together into single blocks, insofar as is feasible, like vowels of the respective prefix complexes.

Note that the vowels, in contrastive columns, differentiate

MATRIX I: ABUA VERB PREFIXES

(when no independent pronominal object follows the verb)

Subject Pronoun		C, T	2 Pl	3 Pl		3 Sg	2 Sg	1 Sg	3 Pl	1 Pl	1 Pl
Tense	Qual- ity	Nonhuman						Excl. Incl.			
		ñfà	idi	idi	òdɔ́	ná	mì ^(ˈ)	bɔ́dɔ́	yóor	yírà	
B Future	+	ḳ	e	e	e/a	a	a	a	o	o	o
C Future	-	ḳ	e	e	e/a	a	a	a	o	o	o
D Present	+	ṛ	e	e	e/a	a	a	a	o	o	o
F Present	-	ṛ	e	e	e/a	a	a	a	o	o	o
G Completive	+		e	e	e/a	a	a	a	o	o	o
H Perfect	+	ṃ	E	E	E/A	A	A	A	O	O	O
J Imperative	+		i	E	E/A	A	ɔ̣	u	O	O	O
K Participial	+	ṛ	E	E	E/O	O	O	O	O	O	O
L Stative	+		E	E	E/O	O	O	O	O	O	O
M Stat./Perfect	-	ḳ	E	E	E/O	O	O	O	O	O	O
N Stative/Past	-		i	i	i/O	O	O	u	u	u	u
P Conditional	+	ṃ	i	i	i/u	u	u	u	u	u	u
Q Conditional	-	ṃ	i	i	i/u	u	u	u	u	u	u
R Imperative	-	ḳ	e	i	i/u	u	a	u	u	u	u
S Past	+		I	I	I/A	A	U	U	U	U	U

some of the persons: e characterizes second plural and third plural nonhuman, in "tenses" (rows) B-M; i in tenses N-S (but with i, e, reversed in second plural J

and R). The vowel a is found in tenses B-H, versus o in K-M, u in P-Q (and mixture in J, N, R, S) for third singular human, and for first and second singular. Similarly, o and u occur with 3 plural human, and first plural inclusive and exclusive, whereas third singular nonhuman has alternate forms for e/a, e/o, i/u, and i/a.

Several other elements must be understood on the matrix before illustrations can be matched against it: 'Quality' refers to positive (+) (i.e., affirmative) and negative (-); this affects the consonant and tone frequently, but the vowels (as in J, R) less often. The consonants of the prefix are often contrastive for tense (e.g., B versus D). The vowels sometimes differentiate "tense" (e.g., N-S versus B-M), as well as simultaneously¹ differentiating person (e.g., the vowel i signals rows N-S, and columns 2pl and 3pl nonhuman). All vowel letters are morphophonemic symbols, representing vowel harmony with vowels of the verb stem. Vowels in capital letters are predictive morphophonemic symbols indicating that the following consonant of the stems of Class 2 verbs--but not the vowel itself--will be changed. In a Class 2 (but not Class 1) verb, the stem-consonant will be replaced by w after I, U, but by zero and vowel length after E, A, O; p replaced by b, t by r, k by g.

We leave for the moment the tone contribution to the verb so as to continue studying the vowel patterning. Abua Matrix 2 shows what happens to any one vowel quality of Matrix 1 when the verb is accompanied by an independent objects pronoun. (In positive sentences, the pronoun object usually follows the verb; in negative sentences, it usually precedes it.) Vowel harmony continues to operate between verb prefix and stem. Capital letters, in Matrix 2, again predict consonantal morphophonemics.

There is an astonishing degree of regularity in the fusion of the old included object element to these non-object vowel forms. There are few exceptions to the implications of Matrix 2:

MATRIX 2: VOWELS OF ABUA VERB PREFIXES

(when an independent pronominal object accompanies the verb)

Object Pronoun →	2 pl	1 pl	1 pl	1 sg	2 sg	3 sg	3 pl
Verb prefix vowel from Matrix 1 ↓	fīnā	Excl. fyoor	Incl. fyirā	fimī	nīnā	nōdī	bīdī
i	I	I	I	I	i	i	i
e	I	I	I	I	E	e	e
u	I	U	U	U	u	u	u
o	I	U	U	U	O	o	o
a	I	U	U	U	A	a	a

¹The dual semantic role of such a formative I have elsewhere called anti-redundant. See my 'Non-linear Order and Anti-redundancy in German Morphological Matrices,' Zeitschrift für Mundartforschung, 32.193-221 (1965).

Note the *i-* prefix in the independent object pronouns 2pl, 1pl incl, 1pl excl, at the top of Matrix 2: \acute{i} - $\acute{n}\acute{i}\acute{n}\acute{a}$ '2 pl', etc. Only when the independent object pronoun has this high front prefix does change take place in the fusion matrix: no change occurs with 2 sg, 3 sg, 3pl. A similar **i-* element seems to have occurred within the verb itself. There $i + i > i$; $i + e > i$; and $i + u, o, a > u$ except in 2 pl when $i + u, o, a > i$. The **i-*, that is, raises front and back vowels, and also fronts the central and back vowels except in 2 pl.

This in turn leads in Matrix 2 to the display which shows *i* outranking *u*, and *u* outranking *o* and *a*, resulting in the characteristic L shapes. Returning to Matrix 1, an included ranking structure is seen in the relation of *o* to *a* in Rows B-M of the columns to the right. The source of such ranking structures, in instances of this kind, seems to be priorities in fusion. The result is sometimes ambiguity. Ambiguity is not as great as appears from Matrix 2 alone, however, since the consonant differences of Matrix 1 continue in force, and the tone differences also contribute to the contrasts.

5.2. Tone Pattern in Verbs. The tone of the Abua verb as a whole is determined by (1) the inherent tone of the last syllable of verb stems, (2) by the length of vowel in the prefix (not discussed here), determined by the stem, (3) by the number of syllables in the stem-plus-suffix complex²; (4) by the tone of the prefix complex (see in Column C, T of Matrix 1), (5) by presence of pronominal object in the context, (6) by position of verb in primary or secondary place in a cluster:

(1) Although stems in Abua verbs differ contrastively by tone, these inherent differences are relevant only to the future and present positive-- Rows B and D--and only to the last syllable of the verb; e.g., for $\text{bul}\acute{a}$ 'to forget' versus $\text{tugem}\grave{i}$ 'to teach'. (All other rows of Matrix 1 of Abua have inherent stem tone completely overridden by patterns determined by the following features.)

(2) Some stems require a long vowel in the prefix, and a different set of tone patterns on stem-plus-suffix, conditioned by the prefix.

(3) The tone pattern of polysyllabic stem-plus-suffix is in two parts: (a) the final syllable and (b) all other syllables. The final syllable carries one tone, and the balance a second tone (with each syllable of the balance having that second tone repeated). In monosyllabic elements of a comparable type, the two tone parts are often fused on the one syllable, often with a resultant glide, but occasionally the fused form is not the same as the longer form compressed.

(4) The prefix complex carries its own contrastive tone, as well as determining the contrastive tone of the verb pattern as a whole.

Some typical patterns of the total Abua complex can be given, keyed into the rows of Matrix 1. Tones will be labeled T (top, special tone in negative only, H (high), L (low):

² The suffixes of Abua are not otherwise relevant to our discussion here. Several orders of suffixes--and possibly enclitics--occur.

TONE PATTERNS OF ABUA VERBS

Tense Complex	Short-Vowel Prefix Tone	Polysyllabic		Monosyllabic
		Medial Tone	Final Tone	Fused Tone
D	L	...H	varied	varied
F	T	...L	H	LH
H	H	...H	L	L
M	HL	...L	H	H
S	H~L	...L	H	H
Stems requiring a long-vowel prefix may have contrastive patterns:				
F	TL	L	H	H
H	H	L	L	L
S	HL	L	H	H

Sample verb forms are now given to illustrate both the Abuan tone elements mentioned, and the vocalic and consonantal elements of Matrix 1:

Tense D, present positive:

ńínà	rè-búlá	'you are-forgetting'
̀̀nún	rè-búlá	'the-bird is-forgetting'
̀̀dǫ	rà-búlá	'he is-forgetting'
̀̀dǫ	rò-búlá	'they are-forgetting'

Tense F, present negative (with ̀̀ as top tone):

ńínà	ré-búlá	'you are not-forgetting'
------	---------	--------------------------

Tense G, completive positive:

ńínà	é-!éghèrì ní	'you know'
------	--------------	------------

Tense H, perfect positive:

ńínà	mé-ghì	'you have-gone'
------	--------	-----------------

Tense Q, conditional negative:

ńínà	mì-kì	'you would-not-have-gone'
------	-------	---------------------------

(5) Presence of an independent pronominal object in the clause sometimes modifies the tones further. We have already seen that an *i- comparable to that of the pronoun seems also to have been fused to the verb prefix complex. A related fusion appears with the high tone of that *i-, also carried into the verb prefix. (In addition, although the pronoun ńínà '2 sg' lacks the prefix i-, it does have the high tone--and this tone is found fused into the prefix complex.) Contrast

	ìgâ	rèbúlá	'the goats are forgetting'
with	ìgâ	ríwùlà	ńínà 'the goats are forgetting you'

in which both prefix tone and prefix vowel are changed--and the final high stem tone is also lowered. If the verb-prefix vowel is i, however, the tone change does not occur:

ńínà	ìbùlà	'you did not forget'
ńínà	ìwùlà	íyòòr 'you did not forget us'

Nor does tone change occur when the verb prefix itself has high tone.

For Etung, materials are abstracted from data and presentation provided by Tom Edmondson. There is a highly intricate chain of interdependencies in the tone of the Etung verb. Certain (indicative) prefix tones affect other (pronominal) prefix tones (preceding them), and the stem tone. Overt tense suffixes affect the tone of the verb stem; the stem-suffix combine is closely enough integrated to warrant a special term--the verb 'core'. Covert (fused) tense suffixes are actualized as tone changes of verb stems. (Tone patterns of the core are distributed over the core, with the last syllable of a core carrying one tone or one tone complex, and the other core syllables all carrying the other tone of the pattern.) The tone class of a suffix, mediated by the tone class of the core, may affect the tone of the prefix. The tone of a prefix occasionally affects the tone of a suffix. The whole verb, therefore, comprises a close-knit but contrastive chain of tones. We can only give brief illustrations here.

(Indicative) Prefixes affecting other (pronominal) prefixes:

à-kí-gùré 'he is selling '
 á-!mó-gùré 'he won't sell '

Here a 'he' is raised before the future negative !mo.

(Indicative) Prefixes affecting stems:

á-!mó-gùré 'he won't sell '
 á-!mó-!bómé 'he won't put on '

Here the Class A stem gùré is low-high in tone, whereas the Class B stem has received lowering influence plus high high. All other Class A and Class B stems would act like these, after !mó. The indicative prefix may affect a following repetitive prefix (as if it were a Class B stem) which in turn affects the stem.

Overt suffixes affect the tone of the stem, leading to an over-all pattern for the core:

à-bómè 'he put on '
 á-bòm-á 'he puts on habitually '

The CVCV stem bómè loses its final vowel, replaced by the suffix -á; and the high-low pattern is reversed.

Suffix affecting prefix:

ñ-sũ-k 'I have been washing '
 ñ-sũ-k 'I wash '

The tense labelled by Edmondson past habitual -k contrasts, over the total verb (seen here in the low prefix), with the present habitual (seen with high prefix). The tone classes of these suffixes differ arbitrarily but morphophonemically, at this point, in their effect on the prefix.

Prefix affecting suffix:

á-sũ-k 'he washes '
 á-sú!'-k 'they wash '
 à-sũ-k 'he has been washing '

The first two illustrations share the present habitual tense, but differ in their pronominal prefix. The phonological contrast arising from change of prefix, however, is manifested in the core. The third illustration, changing tense to past habitual, again shows contrast of total word, but with the pitch of the pronoun actualizing the differ-

ence; in the first illustration, the fused suffix raises the tone of à to á.

The interlocking of various parts of the verb with one another, in tonal relations, raises a question: How can one visualize the mechanism by which this has arisen? And can an alternate descriptive device aid in understanding of the synchronic system? I wish to suggest one kind of answer, but this must be delayed until after certain tone matters have been discussed from a different viewpoint in the phonology chapter. (See § 6.4 where I shall suggest a left-to-right ordering of rules of fusion, with a morphophonemic raising influence--as well as down-step phoneme--to handle some of these details.)

5.3. Hausa (Afroasiatic) Formatives in Person-Aspect Markers. In § 1.6 certain clause characteristics of Hausa, a Chad language of West Africa, were given in order to show how properties of syntax can be compared. Likenesses and differences within a region can thereby be discussed, as over against the family likenesses. Similarly, for the same Chad language, I now wish to point out that techniques of matrix arrangement, with permutation of rows and columns, allow interesting possibilities of abstracting formatives, for contrast or comparison with the Niger-Congo materials. Here, again, I use the work done for me by Gisela Kappler, based on data of Abraham and others (see fn. 14, Chapter 1). Kappler first points out that the aspect-pronoun complex (seen in syntactic context in § 1.6 above) is very intricately structured. With it, a bewildering interlocking of components fuse into irregular patterns of contrastive prefix, suffix, tone, length, consonant, and vowel to signal negation, time, aspect, syntactic function, person, number, gender. In order to show some of the near-regularities buried within the larger mass, she abstracts a chart (see Hausa matrix of pronoun-formatives) which gives only the nuclear syllable of the aspect-pronoun complex of the verb phrase (eliminating prefixes and suffixes from the complex, and deleting also length and tone from it, and omitting independent pronominal forms).

HAUSA MATRIX OF CERTAIN ABSTRACTED PRONOUN-FORMATIVES

	pl. ¹	pl. ³	pl. ²	sg. ^{2f}	sg. ^{2m}	sg. ^{3f}	sg/pl. ⁴	sg. ^{3m}	sg. ¹
Future	mu	su	ku	ki	ka	ta	a	i	n
Neg. Future	mu	su	ku	ki	ka	ta	a	i	n
Neg. Perfective	mu	su	ku	ki	ka	ta	a	i	n
Progressive	mu	su	ku	ki	ka	ta	a	ya	n
Optative	mu	su	ku	ki	ka	ta	a	ya	n
Neg. Progr. 2	mu	su	ku	ki	ka	ta	a	ya	ni
Perfective	mu	su	ku	ki	ka	ta	a	ya	na
Relative Perf.	mu	su	ku	ki	ka	ta	a	ya	na
Rel. Progr.	mu	su	ku	ki	ka	ta	a	ya	na
Habitual	mu	su	ku	ki	ka	ta	a	ya	na
Neg. Habitual	mu	su	ku	ki	ka	ta	a	ya	na
Neg. Progr. 1	m ^{Wa}	s ^{Wa}	k ^{Wa}	k ^{Ya}	ka	ta	a	ya	na
Neg. Indefinite	m ^{Wa}	s ^{Wa}	k ^{Wa}	k ^{Ya}	ka	ta	a	ya	na
Future									
Indef. Future	m ^{Wa}	s ^{Wa}	k ^{Wa}	k ^{Ya}	ka	ta	a	ya	na

———— encloses a block with u and u w

----- encloses a block with k

..... encloses a block with a

Within this matrix, rows and columns have been permuted to bring together like formatives so that their semantic relations can be more easily studied. The central block, which is determined by *k*, covers all second persons--singular and plural, masculine and feminine; differentiation among them must be by the vowel formatives. Other consonants signal further persons: nasals for first person, with *m* for plural and *n* for singular (think of the matrix as a cylinder, to bring the formatives together); *s* for third plural; *t* for third feminine singular, *y* - *i* third masculine; # for fourth singular and plural.

Crossing this signal set are the vowels: *u* for all plurals except fourth--and redundantly helping to distinguish first plural from singular; *i* - *y* for second feminine--with redundant overlap with *k* as signalling second person in those aspects (first three rows) where *i* is not found as an alternate of *y* in third masculine; *a* as nonplural nonsecond-feminine--but irregularly absent in certain aspects with third masculine (same three rows) and first singular (first six rows). The vowel *i* without consonant, however, signals (anti-redundantly) the semantic complex of singular third masculine.

Even with this amount of abstraction, complexity of old fusions is implicit. In the last three rows internal reconstruction suggests that a suffix *-a plus *ku- gave *k^wa* (although here I seem to have two non-identical sets of data, in one of which the *w* occurs only after the *k* in these rows); and *ta- plus the same *-a gave *ta*. In the early rows of the last column, similarly, the synchronic anti-redundancy is due to *n* + *a* > *n*, and so on.

With the full, non-abstracted data, further layering of nonfusion, partial fusion, and complete fusion needs studying. Note, from Kappler's listing, the following full forms of the eleventh row (negative habitual), in the order given on the matrix from left to right: *bámúkàn*, *básúkàn*, *bákúkàn*, *bákíkàn*, *bákákàn*, *batákàn*, *báákàn*, *báyákan*, *bánákàn*. Here the addition of *bà-* 'negative' and *-kàn* 'habitual' (compare *tákàn*, 'positive habitual third feminine') seems straightforward. But even here the tones are not so easily treated as this would make them appear. The tone of the nuclear element of the complex is high before a suffix like *-kàn* (hence *bánákàn*); but low after a prefix (*bà-*), when not followed by a suffix, the *bà-* > *bá* and the nucleus becomes low, as in *bá·sù* 'negative progressive₂ plural third person'. Yet, elsewhere, tone may be contrastive: *ká·* 'perfective second person singular masculine' versus *kâ·* 'indefinite future second person singular masculine'. Part of the range of such problems can be seen by illustrating one column of the matrix, the third plural, in the order given there: *zá·sù* 'future', *bázá·sù* 'negative future', *bàsù* 'negative perfect', *súnà·* 'progressive', *sù* 'optative', *bá·sù* 'negative progressive₂', *sún* 'perfective', *súkà* 'relative perfective', *súkè* 'relative progressive', *súkàn* 'habitual', *bàsúkàn* 'negative habitual', *bà·sù* 'negative progressive', *bá·sâ·* 'negative indefinite future', *sâ·* 'indefinite future'.

In comparison, now, with the Niger-Congo languages Etung and Abua, this Chad language shares certain typological characteristics: (1) The tone pattern of the aspect-pronoun complex must be treated as a whole, just as the Etung verb tone (§ 5.2) had interlocking relations from prefix through suffix. (2) The complex of elements, with irregular blocks of formatives, is typologically reminiscent of the Abua verb (§ 5.1).

On the other hand, repeated warning must be kept in mind that general typo-

logical similarity is not evidence for genetic relationship. Details must be reconstructed.

In thinking of utilizing matrix block-shapes for reconstruction purposes, one notes (and see discussion in last reference given in fn. 2 of Chapter 1) that the specific arbitrary shapes in relation to specific category sets must be compared. The basis of classical comparison is the patterned relationships across languages of the arbitrary relations of morphemic form (phonological content) to semantic content (lexical meaning) within a language. An analogous basis for reconstruction of certain morphological patterns would appear to be an equally rigorous application of the comparative method to an arbitrary relation of matrix form (that is, shape of its formative blocks) to matrix semantics (its intersecting categories). General relationship will not do. It is the highly arbitrary detailed relation of form to meaning which, when seen as patterns across languages, should be able (1) to carry conviction of relationship and (2) to be reconstructable.

VI. PHONOLOGY

In preceding chapters attention has been given largely to grammatical matters (or, in § 5.2, to morphophonemics). Here I turn to several interesting problems of phonology.

6.1. Quasi-Isochronic Units of an Accentual Hierarchy. In both the Abua and the Etung materials (§ 5.2) certain rules of tone placement apply to distribution of tone patterns over entire stems, whether one or more syllables were involved. It seemed to me improbable that such control would take place unless a larger phonological unit of some type were a setting within which these rules could be operative. In Basare, work in collaboration with Monica Cox led to the postulation of quasi-isochronic feet which were in some sense simultaneously accentual units, and an accentual hierarchy which interlocked with the grammatical hierarchy but was not identical with it.

Within a unit substantially larger than a word--a clause, for example--replacement of one word by others with respectively different numbers of syllables left the basic timing and the accentual dynamics of the clause perceptually unaffected. The stressed syllables (which I shall now call "accented syllables" in order to avoid the implication of intensity in the term "stress") remained the same in number. A unit of timing¹ was clearly perceived under these conditions--and may be called a "foot".

Compare:

- | | | |
|---------------------------------------|--|-----------------------------|
| [1] ā "ńí t·ú'wān tùm- mǐ-nēē | 'you know thing which-is-here' | [subordinate clause marker] |
| [2] ā "bátí tu'wān tùm- mǐ-nēē | 'you carve-up thing which-is-here' | |
| [3] ā "cáá tú'wān tùm- mǐ-nēē | 'you have thing which-is-here' | |
| [4] ā "dákáǐ tú'wān tùm- mǐ-nēē | 'you taste thing which-is-here' | |

In this set, the units 'ńí, 'bátí, 'cáá, and 'dákáǐ ('know', 'carve-up', 'have', 'taste') are perceived as astonishingly similar in length, except that the length of ńí (but not of cáá) is partially carried by the conditioned length of the following t (in t·ú'wān). The rhythm--clear, and easy to hear within this arrangement of examples--is unaffected. Accents come at the same perceived intervals; the accent of tú'wān is not delayed, that is, by the added syllables of the preceding 'dákáǐ. The short ńí versus long cáá are perceived as phonemically and phonetically contrastive, even while the rhythm is unaffected; the compensatory length of [t·] preserves rhythmic length without affecting phonemic length. Junctures precede the unaccented syllables. (There remain, also, uncertainties in the relation of the data, above, to the phonemics and morphophonemics of tone; *tùm-mǐ-ń + éé tùm-mǐ-nēē.)

¹ Kay Williamson, in A Grammar of Ijo, Cambridge, 1965, p. 26, suggests, for that Kwa language, a similar unit of timing. Within these 'tone groups' morphophonemic changes of tone may occur (p. 7), determined by the syntax. Tone groups become part of tone phrases, and of breath groups (pp. 7, 11-12).

Laboratory displays of these recordings were subsequently made for us by Charles Peck, with analysis and commentary by Dr. Ruth Brend. The duration of the three feet of illustrations numbered [1] to [4] in two utterances was measured (in seconds) as follows:

[1]:	$\bar{a}'\acute{n}\acute{i}$	$t'\acute{u}'w\bar{a}n$	$t\bar{u}m'm\bar{n}\bar{e}\bar{e}$
	(with the [t'] calculated as part of the second foot)		
	.3	.36	.42
	.24	.3	.38
	(with the [t'] calculated as part of the first foot)		
	.36	.3	.42
	.34	.2	.38
[2]:	$\bar{a}'b\acute{a}t\acute{i}$		
	.4	.36	.4
	.38	.3	.42
[3]:	$\bar{a}'c\acute{a}\acute{a}$		
	.34	.32	.38
	.32	.3	.4
[4]:	$\bar{a}'d\acute{a}k\acute{a}f\acute{f}$		
	.48	.34	.4
	.4	.34	.42

Brend considers that the [t'] probably belongs to a shared border between the first and second foot in utterance [1] and that, taking this into account, the measured differences between the length of the various utterances of the first foot in [1] to [4] to be no greater a variation than could be compatible with perceptual isochrony. (This is especially true in view of the second utterance of [4].) Other utterances of these same sentences measure as follows:

[1]	(with [t'] as part of second foot):		
	.3	.33	.4
	.25	.34	.43
	(with [t'] as part of first foot):		
	.38	.35	.4
	.34	.25	.43
[2]	.38	.32	.42
	.39	.3	.42
[3]	.36	.32	.4
	.38	.34	.39
[4]	.48	.37	.42
	.44	.32	.4

If the calculation of the utterances of [1], in all four cases above, puts the juncture in the middle of the [t'], then the measurements of the first two feet almost invariably come out as nearly identical.

The final foot proved to be longer than the first two, in some of the utterances. This was unexpected; perceptually it had not appeared longer. My assumption, based on prior work with accentual systems, was that perhaps the lengthening before pause was accompanied by a weakening, which lessened its perceptual impact, and went unnoticed by us. I asked from the laboratory further measurements which confirmed this hunch. In observing amplitude sections of these utterances, Brend reported that

the over-all amplitude of the final foot, in each utterance, consistently measures two to three db lower than the amplitude of the first two feet, and there is, typically, a gradual decrease in amplitude in the final foot which is not seen in the first two feet.

I had long used whistling by informants to help me perceive tone changes, and wondered whether it might be helpful in studying dynamic features. On the basis of laboratory measurements, however, it has since become evident that the Basare informants, whistling forms like these, did not consistently whistle in ohunks which corresponded either with feet or syllables, but rather seemed to mix these borders indiscriminately. Nevertheless, they consistently whistled the highest tone at places we have marked with double-stress (") to indicate the peak of the intonation contour as well as the heaviest accented syllable in the utterance. The frequency measurements here, therefore, would seem to confirm the hypothesis that the nucleus of these utterances falls at the places marked with double stress.

It seemed possible, furthermore, in an area where drums were widely used, that some kind of tapping might reveal or support the analysis of some of the dynamic characteristics. We were unable to explore this possibility adequately--but tapping on a table or a tin did not appear to give as satisfactory a perceptual relation to speech as did the whistling. Brend, in measurements of the tapping, feels that the tapping units correspond more closely to syllable units than to feet. In instances where several syllables in speech are collapsed into one spoken foot, for example, the measurements of analogous tapped feet do not coincide with the groupings of the speech measurements. When, however, there is a one-to-one correspondence of number of syllables within two feet, these feet do measure as being very close to identical in length, and to this degree the hypothesis concerning isochrony of feet is confirmed by the tapping, since the consonant and vocalic structures of the syllables did not change the timing. For example, the tapping of [1] for the corresponding three feet postulated above measures as: .4 .38 .41. Within a foot, furthermore, the spoken syllables, when measured, reveal a definite pattern of long syllables occurring as the nuclei of feet, and short syllables as prenuclear. Measurements of the tapped syllables follow the spoken utterances at this point.

There seem to be contrasts between a foot with stress on the first syllable and a foot with stress on the second syllable. These differences are easily overlooked, however, because (a) tone interferes (a high-toned syllable is likely to sound stressed, a low one unstressed, to English speakers); (b) the phonetic difference is very slight, perceptually, so that it can easily be missed; (c) the phonetic character of the contrast may be length, rather than amplitude or pitch (but this particular kind of length difference is awkward to abstract from syllable length caused by post-syllabic consonants or by bivocalic syllable nuclei); (d) a short syllable, half-long under accent, must be differentiated from a phonemic doublet.

[5] kɪ'jɪ·kɪ 'knife'

[6] kɪ'ʔɔ̄·kɔ̄ 'mouth'

[7] kɪ'bf·kɪ 'child'

In [5], vowel qualities and tone heights are kept constant. Here, under controlled conditions, a slight accent carried by half-length of vowel seemed to be perceived.

Pre-nuclear (pre-accented) syllables of the foot were perceived as especially rapid, helping to separate off one foot from a preceding one.

The laboratory analysis later shows, for [5], [6], and [7], that the contrast of tonal heights is confirmed: tone on all syllables of [5] is very even; tone on the middle syllable of [6] is lower than that on both the first and third syllables, with the tone on the third syllable being slightly lower than that of the first syllable; tone on the second syllable of [7] is considerably higher than that on syllables one and three, the tone on the third syllable starting at the same point as that on the first syllable, and then showing a considerable down-glide before silence in one utterance of [7].

As for length of spoken syllables, measurement of spectrograms follows (with three utterances of each item):

[5]	kī	'jī	kī
	.02	.06	.1
	.1	.16	.16
	.06	.2	.16
[6]	kī	'ñō	kō
	.04	.08	.12
	.11	.18	.2
	.1	.18	.21
[7]	kī	'bī	kī
	.08	.16	.16
	.06	.16	.11
	.1	.16	.2

These data confirm clearly that the pre-stress syllable, as expected, is especially short. On the other hand, the final syllable was often as long as--or even longer than--the accented syllable, which we had not predicted from our field observations. Here, as above in reference to the foot as a unit, we would now assume that a final drawled syllable would be heard as part of the prefinal phenomena and that this particular length had served as a cue to pre pausal position rather than as a signal of placement relative to the nucleus of the foot. This necessitated, however, searching for further cues of accent within the acoustic data. A simple measurement of amplitude, however, does not show a one-to-one correspondence with perceived accent. There is a slight hint, however, that a sharper decrescendo occurs in the final unaccented syllable than in the central accented syllable where the amplitude is more constant throughout the syllable; the shape of the amplitude curve within the syllable--not just the crude amount--may prove to be relevant here.

We were disappointed to find that amplitude measurements of neither whistle nor of tap seemed to contribute to the location of the placement of stress since we were neither able to correlate it with our perceived accents nor to find in the record regularities which would suggest better hypotheses; our conclusion for the moment is that neither whistle nor tap in this instance was a useful heuristic device for determining the place of stress. I would personally, however, like to see the devices tested with a variety of languages and informants under the hypothesis that there might be some conditions under which they would be useful.

A hierarchy of feet, with smaller groups in larger ones, seemed to be present in the Basare data. The contrastive features, however, were not too clear nor completely consistent. As a hypothesis for further research, however, one can suggest

that feet join into 'phonological phrases,' and these into 'phonological clauses'; the nucleus comes early, in each, marked by higher pitch, and perhaps sometimes by greater length (or sometimes even by intensity):

[8] ā "yāā | 'káá | dómín | dōō || "án | 'káá || ǵān

Here the intonational pitch seems to drop progressively lower from the beginning to the end, but with major upstep after the first double bar (not, however, as high as the initial start) and with minor ups and downs caused by the separate tones and by the included feet.

Brend suggests that perhaps the most crucial organizing principle for several of the levels of the hierarchy arises from length. Perceptually accented and unaccented syllables within a foot measure long and short respectively (with the exception of utterance-final syllables, for which see discussion above); sequences of feet within an utterance show isochrony, to a remarkable degree (with the exception of utterance-final feet, for which see above discussion); while a foot occurring at the peak of the intonation contour turns out to be slightly lengthened.

Grammatico-lexical considerations affect the hierarchical organization in various ways. The phonology is partially but not completely independent of lexicon and grammar, and vice versa.

A pronominal subject, as in [1-4], is often treated as part of the foot which has its nucleus in the verb. A longer, independent noun subject may comprise a separate foot, as in:

[9] à"laásàn | 'gííí-bì 'Alaasan chops-them'

The object of a verb joins the preceding foot with verb as nucleus, if the verb is short--but may comprise a subsidiary foot, if the verb is long:

[10] 'dòò"yéé | bí'níb nǵn | 'ká fàtākù
'formerly|people remote-time|saw blood'

[11] 'dòò"yéé | bí'níb nǵn | 'dākāfi ,fàtākù
'formerly|people remote-time|thought-of blood'

Abua, of Nigeria, like Basare of Ghana, also has characteristics of rhythm dynamics which involve isochronic feet. A hypothesis worth exploring: The level, medial tones of a verb pattern are those which may be added on to or after the nucleus of the foot without modifying the timing of the foot. This hypothesis we have not had time to test. It seems, however, to hold some promise of illuminating the peculiar pattern of pitch controls which relate grammar to phonological hierarchy while ignoring--to some degree--syllable count.

For an Abua set of isochronic units note:

- | | | | |
|-----|---------|------------------|---|
| [1] | [ódí] | kóòsagán | '[he] has not cooked before' |
| [2] | [ód í] | k ó ò búgòlgán | '[he] has not drunk before' |
| [3] | [ód í] | k ó òkpògòròngán | '[he] has not peeled (plantain) before' |

Where between k ó ò ...gán the medial series of like tones seemed to take perceptually-same time spans, whether one, two, or three syllables. Imagine my surprise, therefore, when Brend showed me the following measurements in which the lengths are closely proportional to the number of syllables:

- | | | |
|-----|-------------|-----|
| [1] | sà -- | .28 |
| [2] | búgòl -- | .44 |
| [3] | kpògòròn -- | .6 |

Since, however, the retrospective perception of isochrony was so strong, I asked Brend to check the spectrograms again to see what would happen if--instead of measuring only the unstressed syllables--the entire foot were measured. (This would leave room for some type of compensatory lengthening such as we had with the long [t̄] in the first of the Basare illustrations.) Note the following measurements, therefore:

- [1] kō^ˆosagán -- 1.0
- [2] kō^ˆobugolgán -- 1.08
- [3] kō^ˆokpogoróngán -- 1.18

As we compare these we notice once more that, in spite of the difference of two syllables, the respective feet are similar in length. I would conclude, therefore, that it is the foot length as a whole that must be studied if one is to correlate measurements with perception.

One must, if these data prove as a guide, however, not expect that the measurements be identical where the feet contain different number of syllables, but rather that a foot with four syllables will not be twice as long as two, nor one with five be five thirds longer than one with three. The partial shortening of the whole foot (relative to what it would be if each syllable took the same time) impresses the hearer as somehow 'rushing to a conclusion' which, in turn, is interpreted as in some sense 'the same'.

6.2. Tone. Many problems of tone analysis interlock in a fascinating complex: The placement of tone, as we have already seen, can be viewed as affected by the morphophonemics of a unit which is prefix-plus-stem-plus-suffix-plus-variant-number-of-stem-syllables (§ 5.2); or some of the same phenomena (e.g., a medial series of like-tone rapid syllables) can be related to accentual dynamics (§ 6.1). The number of levels of tone in a language can for some purposes be viewed as a set of classical static contrastive tone phonemes; but for other purposes is better viewed as a basic set plus a special level limited to negative contexts; and in other instances of a different kind as a basic set with a special contrastive level developed through the loss of low syllables which leave a dynamic influence behind them. Allotones, under these conditions, bring problems of recognition and description. Both the theory and practice of treating tone languages are affected. New phonemes of tone seem to be visible in the process of development; West Africa seems to be an enormously interesting "laboratory" for the study of the dynamics of changing tone systems.

6.2.1. Basic Tone Heights. Niger-Congo languages of West Africa vary in the number of their basic or "normal" tones; e.g., Igede has four, Bette three, Degema two.

In Igede, the four levels of contrast were extraordinarily clear, with the particular informant brought to the workshop by Richard Bergman. (Tone data are from him and from Martin Leigh.) Instrumental analysis of utterances--which were spoken quite normally--gave displays which left the levels so clear cut that they appeared to Brend almost as if they had been "sung". The whistling of the patterns by the informant gave a similar result. Very little influence is seen where one tone affects another.

In the following illustrative set, note Igede contrasts within the frame $\bar{o} \dots \bar{i}$.

Symbols are high to low respectively, / ̄ /, / 7 /, / ' /, / ˘ /.

̄	hú	l̄è	'he has washed'
̄	hū	l̄è	'he has stayed'
̄	hú	l̄è	'he has scattered'
̄	hū	l̄è	'he has flown'

Note also, lá 'to miss', lā 'to have', l̄á 'to chew a stick', l̄à 'to bulge out'.

For Bette, note the following sets, contrasting both before low and after low respectively (with some fusion in the second context):

̄	und̄l	k̄ən	'one person'
̄	kūn̄ō	k̄ən	'one soul'
̄	ūs̄í	k̄ən	'one kidney'
˘	tyà	̄und̄l	'leave the person'
˘	tyà	̄vñ̄ō	'leave the soul'
˘	tyà	̄ūs̄í	'leave the kidney'

(and for further Bette tone heights, see below, § 6.2.4).

Agbo, also, has three tone levels, as seen in data from Klaus and Janice Spreada:

l̄ètá	'stone'
wādūm	'man'
ètèn	'animal'

On numerous short utterances, frame techniques can be used which compare levels of preceding and following pitches, without too much interference from intonational downdrift or conditioned variation of tones.

In many of the languages of West Africa, however, two basic tones are involved, plus added phenomena of great complexity--growing out of intonational downdrift, conditioned variation, and fusion with special residual phenomena (made up of morphophonemic replacements, newly developed tones, and levels of pitch which do not fit easily into either of these two categories). Illustrations will be found in the next few sections.

6.2.2. Lowered Key (Terrace) Developed from Lost Low. It has been less than a decade since Welmers² called attention to the linguists of this century the importance of 'downstep' or 'terrace' tone, to tonal studies. Much earlier Cristaler³ (who had studied with Lepsius) had devised an elegantly simple orthography to cover accurately the transcription of Twi tone with its downstep; and--as Gleason pointed out to me--some published materials showed, in retrospect, that a downstep of a high tone could be correlated with evidence of a lost⁴ low tone. The reconstructed low (sometimes optionally present) by conditioned variation lowered a preceding high; with the loss of the low, the lowering effect on the high remained, with three further results: (1) The key (general height of all following tones in the phrase, including high tones) was lowered accordingly. (2) Contrast developed between a normal-high

² "Tonemics, Morphotonemics, and Tonal Morphemes" *General Linguistics*, 4, 1959, pp. 1-9.

³ In *A Grammar of the Asante and Fante Languages Called Tshi [Chwee, Twi]*, Basel, 1875 (republished in 1964 by Gregg Press Incorporated, Ridgewood, New Jersey).

⁴ E.G., in A.N. Tucker and J. Tompo Ole Mpaayel, *A Maasai Grammar*, London, Longman's Green and Co., 1955, p. 172.

(i.e., one not thus conditioned downward) after high, and a stepped-down-high after high and both contrast with low after high. (3) The resultant system of contrasts contained an imbalance: After any one morpheme with final low tone there could follow only two contrastive phonetic levels--low and high; after any one morpheme with final high tone, a three-way contrast of phonetic levels could occur between high plus high, high plus stepped-down high (from a reconstructed low plus high morpheme), and high plus low. Thus (with /! / representing the downstepping of the tone immediately following that symbol; and the *LH having high slightly lower phonetically than in *H):

- (1) i) H + H
 ii) H + !H < *H + LH
 iii) H + H

but

- (2) i) L + H
 ii) L + L

In phonetic graph (with hyphens representing relative height in the pitch-envelope):

- (3)
$$\begin{array}{c} * \\ \left(\begin{array}{ccc} - & & - \\ & - & \\ & & - \end{array} \right) > \left[\begin{array}{ccc} - & ! & - \\ & & \end{array} \right] \\ \hline \text{H L H} \qquad \qquad \qquad \text{H ! H} \end{array}$$

The place of the morpheme boundary--whether preceding versus following the low--affects radically the kind of phonetic differences one can find in frames. If the morpheme boundary precedes the *L as in (1ii), the three contrasts (HH, H!H, HL) can be found following the first morpheme. When, however, the *low is part of the first morpheme, as in

- (4) H!H < *HL + H

then only two contrastive types can follow it:

- (5) i) H! + H (high followed by lowered high)
 ii) H! + L (high followed by low, which is unaffected by the loss of the preceding low)

since a normal high without downstep (see 1i) cannot occur there.

Once a high has been lowered by *L, the contrastive types and the phonetic lowering repeat, until the end of some kind of larger phonological phrase, producing a characteristic terracing effect.

The downstepping influence may also sometimes occur in the middle of a morpheme--and other complications occur.

The most extensive and illuminating discussion of the problem may be found in a series of exchanges⁵ between Stewart, Welmers, and Schachter. Here Stewart proposes the influence /! / as itself a 'separate phoneme'; Schachter (p. 37)

⁵ In J. M. Stewart, "The Typology of the Twi Tone System," with comments by P. Schachter and W. E. Welmers, preprint from the Bulletin of the Institute of African Studies I, Institute of African Studies, University of Ghana, n. d.

See also, --amongst others-- D. W. Arnett, "Downstep in the Tiv Verbal System," African Language Studies, 5, 34-51, 1964, and F. Winston, "The 'Mid Tone' of Efih," African Language Studies, 1, 185-92, 1960. Winston's phonemic treatment of the downstepping influence is of special interest.

assumes that 'no strictly phonemic analysis' of the data is possible--and attempts to deal with them 'on the morphophonemic level'; Welmers (p. 55) has a writing system and analysis--which is 'not morphotonemic' but one showing 'phonemic contrast', such that one postulates (p. 56) somewhat cautiously either a system having 'three "tonemes" (high, drop, low) or 'two "tonemes" plus a phonemic "downstep" '; in which, for example (1 i, ii, iii) could be written as HH, HD, HL.

The theoretical implications of the problem we leave for § 6.2.8, in order to add certain kinds of detail.

6.2.3. Terrace Tone Developed from Low-Replaced-by-High. The major attention to terracing has been given to a downstepped high tone resulting from loss of a preceding vowel which had carried low tone (which had previously caused the lowering, nonphonemically, of the high following it).

In this section I wish (1) to emphasize that the downstep sometimes clearly develops not with the loss of a vowel carrying low tone, but by the morphophonemic replacement of a low tone by a high tone and (2) to show that this phenomenon sometimes has an extremely limited distribution, controlled in part by its place in a larger phrase.

The clearest data from the workshop, for these purposes, comes from Elaine Thomas, in a comparison of two closely-related languages--the Engenni and the Degema of Nigeria.

In Degema, three of the major tone classes of nouns have a downstepped one which corresponds to a low tone in Engenni. Note, for example:

- (6) i) Degema ák'í 'pot'; Engenni akì
 ii) Degema ùmém'é 'faith'; Engenni ùmê
 iii) Degema éśàrù 'mosquito'; Engenni ús'átú
 (Only a few nouns of the class *HL remain in Degema; most have become H¹H.)

Within Degema there are numerous further evidence of ¹H < *L in syntactic positions. Note the verb plus object when verb ends in high:

- (7) ðmón *úkó > ðmón ¹úkó 'he saw a canoe'

For morphology, note:

- (8) Engenni ðtá-nì 'he went'; Degema ðtá'án

On the other hand, the Degema changes of *L > ¹H in the noun seem to be extremely limited in distribution within the larger utterance. They occur (with possibly a few exceptions) only on morphemes directly preceding an utterance-final juncture. Compare:

- (9) i) ðmón ¹úkó 'he saw a canoe'
 ii) ðmón úkó-yò 'he saw the canoe'
 iii) ðg'é ũk'í 'he looked at pots'
 iv) ðg'én ũk'í yò 'he looked at the pots'
 v) ðyì á-ò'ó 'he is there'
 vi) ðyì á-ò'ó múvái 'he is in the house'

In (9i) the *úkó > ¹úkó; in (9ii), however, low is replaced by normal high (*úkó > úkó) before a further morpheme.

6.2.4. Indications of a Developing Downstep in a Three-Level System. We have shown (§ 6.2.3) downstep in Degema, where only two regular levels occur. Now I wish to show a downstep system occurring in a language with three regular levels. The data, from Bette, come from the work of Ruby Peterson and Irene Crane. Contrasts of the three Bette levels were shown in § 6.2.1. We first, in 1a-c, repeat a set of contrasts after a low tone. Reconstructed forms are given with an asterisk when it is desired to show pre-fusion forms, or forms before tones have undergone morphophonemic change.

- (1a) *(tyaŋ ùndl̩) / tyà ùndl̩ / 'leave the person'
 (1b) *(tyaŋ kūñō) / tyà ùñō / 'leave the soul'
 (1c) *(tyaŋ úsf̩) / tyà úsf̩ / 'leave the kidney'

In (2a-2d), we establish that the first word is now a high tone or a sequence of high tones. Stresses are marked, perceived on the last high syllable of words, by a small vertical stroke.

- (2a) /kítá' tál kən/ 'one basket'
 (2b) /f'yé kən/ 'one mother'
 (2c) *('bé lè ùndl̩) /bé l̩ùndl̩/ 'come with the person'
 (2d) /kígú'gó kən/ 'one hill'

A sequence of high-tone words is thus given in (3a). The pitch graph above the phonemic writing shows that a step down occurs after the syllable marked with stress (giving the phonetic impression of a down-step system).

- (3a) *(f'yé 'á 'bé hē kígú'gó) /f'yá 'á 'bé ígú'gó/
 'mother she came to the hill'

Then in (3b) a mid tone is introduced into the sequence, to show high tone stepping up after it. In (3c) a low tone is similarly introduced to show that the three-way contrast of levels still exists between two high-tone phonemes, the first of which is stressed.

- (3b) *(f'yé ábē hē ūbō hē kígúgó) /f'yá 'á 'bó ūbō hē ígú'gó/
 'mother came to the main road on the hill'
 (3c) *(f'yé ábē l̩è kítátél ísf̩) /f'yá á 'bó l̩è ítá' tál í'sf̩/
 'mother came with a basket of kidneys'

Illustration (4a) shows a low-high word which with a preceding low in (4b) combines into a high high-low sequence. In (4c) it is seen that the change to (4b) first took place (by an ordered rule) and then was treated as beginning high in (4c), stepping down regularly after a stressed high.

- (4a) *(káté kən) /káté kən/ 'one market'
 (4b) *(hè káté) /háté/ 'to the market'
 (4c) *(kítátél kíbé hē káté) /kítá'tál f'í'á á 'tè/
 'the basket came to market'

The system described here (three regular phonemic levels plus a nonphonemic downstep after a stressed high) could very easily develop into a typical phonemic downstep, plus three phonemic levels. If, for instance, fusions as in (4c) were to

lead to a different (nonfinal-in-word) placement of stress while retaining placement of downstep, the downstep would probably have become phonemic.

On the other hand, if other investigators (a) did not on these same data record stress as in the way we have done, and (b) if word boundaries were ignored, their analysis would probably show downstep as already phonemic. Inasmuch as stress analysis in this language is by no means obvious--or certain--the alternate analysis should be kept in view.

After this analysis in the field, laboratory work by Peck and Brend gives general confirmation of the pitch contrasts of instances such as (1a-c). Similarly, the instrumental measurements add no major difficulties to the analysis of pitch sequences in the downstep series--nor are they able at the moment to help very much (because of limits to current acoustic techniques) on the important problem of stress.

6.2.5. Extra-High Tone and Up-Step Developed from Influence of Low. In various languages an extra-high tone occurs, contrastively, but limited perhaps to the negative and a few other places. Note, for Abua:

ńínà kẹ́-kí	'you will go'
ńínà kẹ́-kì	'you will not go'
ńínà rẹ̀-búlá	'you are-forgetting'
ńínà rẹ́-búlá	'you are-not-forgetting'
ńínà m̀-ki	'you would-have-gone'
ńínà m̀-kí	'you would-not-have-gone'
póg	'Look!'
ké-póg	'Do not look!'

Gardner and I seem also to hear, for this special Abua tone, an added intensity, or "tight" voice quality. Brend's laboratory findings clearly confirm the special height with regard to measured frequencies. The extra-high tone is consistently and regularly higher than the normal high tone. Note, further, the low following it in the first two illustrative pairs.

Such data lend weight to the analysis of Engenni by Elaine Thomas (revising the initial report). She shows that for the Engenni data one must, in order to account for the extra-high tones, either postulate both a phonemic downstep much like those discussed above and an additional upstep; or one may treat all the data solely from the point of phonemic upstep. The latter solution is much simpler:

(a) One begins with high tone conditioned to extra-high, automatically (and unexplained, here) before low. Note, for example, the extra-high pitch (shown in the pitch line below the citation) on syllables marked with / 7 as phonemic high, following a non-upstepped high:

<u>ákpúkùrò</u>	'fufu food'
<u>ámó tà</u>	'let a child go'

(But following an upstepped high, another high cannot be upstepped until a low has interposed; and an elided low does not serve this function.)

(b) The upstep remains after a conditioned low has been lost, so that the upstep becomes synchronically contrastive.

<u>ámù</u>	<u>ópílópó</u>	(*ám̀)	'house of pig'
<u>ìkpóíí</u>	<u>ígbo</u>	(*ìkpóíí)	'many nets'

(c) In some instances a reconstructable verb prefix has been upstepped by the low verb stem; the prefix has then been lost, but not before transferring its extra-high tone backwards to the noun preceding it. Compare a Degema example (closely related to Engenni) which has its prefix *ó* still present, with the cognate Engenni phrase in which the prefix is lost and the vowel tone of the stem is lost, but the last syllable of the noun 'child' is extra-high:

Degema:

<i>ó</i> móyò	<i>ó</i> -tá	mùvà`
child	go	to-house

Engenni:

ámóná'	[á]	<i>ó</i> mù
child	go	house

(d) Several other circumstances require the Engenni upstep: certain uses of negative and subjunctive; the verbal particles *i* 'then' and *na* 'purpose'; final tone of a subject noun phrase with referential verb; the first syllable of the second of two nouns in sequence; some arbitrarily defined syllables of four-syllable nouns; and the final syllable of an object noun phrase before the next verb of a serial verb construction. On the other hand, a few items (the connectives *ka*, *ga*, *na*) resist the upstepping influence.

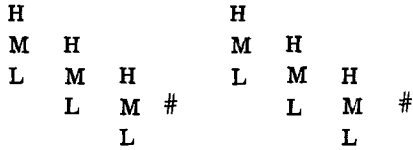
6.2.6. Overlap of Conditioned Allotones. In the Igede, of § 6.2.1, levels were clean-cut, and fairly uniform in their respective heights throughout the phrase.

In downstep systems, however, conditioned variation of tone levels leads to extensive problems. This statement, however, is historically stated backwards: A system of conditioned variants of tone has led to the particular tone feature known as phonemic downstep. The sources may be the conditioned lowering of a high by a preceding low (§ 6.2.2), by conditioned lowering of high in its morphophonemic source in a low (§ 6.2.3); by a lowering of high after stress (§ 6.2.4). Or an extra high may take its source from a high (§ 6.2.5) which was raised before a low. Many morphophonemic changes (§ 5.2) reveal conditioned-replacement of tones without observable current allophonic traces.

The extensive variety of such effects implies some general dynamic character (see also § 6.1) for these systems: A general tendency for the pitch level of a phrase to 'drift' downward,⁶ rather than stay on an even key in steady pitch 'bands'.

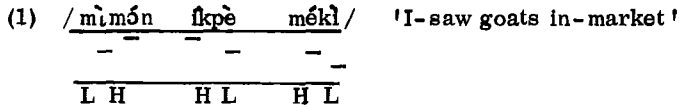
In principle, if the drift were rapid enough, a three-toned system could have the following pattern:

⁶ Welmers has emphatically pointed this out--as in Stewart (reference in fn. 5), p. 54.

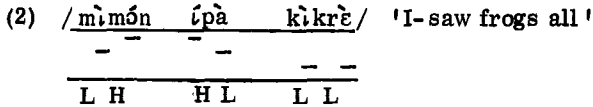


in which each syllable can carry any one of three tone phonemes (H or M or L), but the next syllable in the series (with the same set of possible contrasts, no more and no less) would by conditioned variation (in the down-drifting contour), have each tone phoneme suppressed in phonetic (not phonemic) height one notch. The result would be: H + H would not be level (the second would be lower); M + H would be level with each other (but in phonemic contrast, relative to other potentially substituted elements at that point in that frame); L + M would also be on a single level, etc. ⁷

In Degema, Thomas shows some of these phenomena. Between words (but not within them, under penalty of collapsing some of the system) a word-final low depresses a following word-initial high to its own low phonetic pitch, but a following word-initial low to lower than the first low. Note:



but

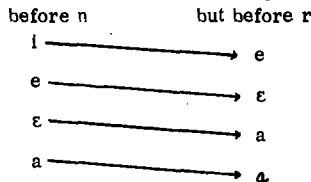


In (1), note that L and H in the middle of íkpè mékì are on the same level; and that -kì is lower than the first syllable of mìmón.

In (2), on the other hand, note that L plus L between ípà and kíkè sharply; the L of kíkè contrasts with (is lower than) the mé- of mékì in (1)

The phenomena, furthermore, are in addition to those for phonemic downsteps /! / discussed for the same language in § 6.2.3; or upstep for Engenni in § 6.2.5.

⁷ For a comparable situation of overlap in classical phonemics, see



in Danish in André Martinet, "Ou en est la phonologie?" *Lingua* 1, 1948, p. 43.

For explicit discussion of this kind of problem in the analysis of tone, see my *Tone Languages*, Ann Arbor: University of Michigan Press 1948, especially p. 57 (for graph) and pp. 61 and 56 (for insistence on adequate procedure to keep from being confused by change of general height (vs. phoneme height) from one syllable to another). Welmers, in discussing rather rigid tone 'bands' (see the Stewart article referred to above, in fn. 5), seems to have overlooked these sections of my material.

For further discussion of the more general problem in terms of typological comparability of subsystems of phonemes, see my *Language*, Glendale [now Santa Ana], California: Summer Institute of Linguistics, Part II, 1955, §§ 8.33 (7), 8.34, 8.441, 8.442.

In Izi, data from Paul Meier illustrate one of the most pervasive--and, at first, disturbing--of these situations: A sequence of L H[!] H has the low and the downstepped high on the same pitch:

/mēē ré[!] jí/ 'I-present sell yams' (with è and[!] jí affirmed to be on the same level; a statement clearly confirmed, like many other crucial parts of the tone phonetics of Meier's material, by laboratory tests by Peck and Brend)

/mùtùrògbó[!] nōsíf/ 'I threw a stick at Ogbona' (with -rò- and[!] nōsíf on the same pitch; from *[mù tùrù ògbónà òsíf])

But there is a contrast of LL with the[!]HH, in the same environment:

/mùtùrògbónìphè/ 'I threw something at Ogbona' (with -nì- lower than rò-- and -[!]no--; and with -phè still lower, since prefinal low-low drifts down a bit; from *[mù tùrù ògbónà íphé] where the nouns belong to different morphophonemic classes)

It is the presence of contrasts in such comparable environments which justifies the contrastive phonemic status of the elements; and it is the lack of more than the topologically-equatable members of the sets which forces the analysis of like-levels as phonetically-overlapping but phonemically contrasting tones in the different environments. (Emphasis on different environments is maintained, lest that kind of intersection of phonemes be postulated which is unacceptable within postulates of classical phonemics.)

Many other intricate problems of contrast arise in the Izi data, but they cannot be illustrated here in detail.

6.2.7. Towards Internal Reconstruction of Tone Chains. In scattered instances in preceding sections there have been given starred forms, implying some degree of internal reconstruction. Can such tentative, internal reconstruction be carried substantially further? If so, could it illuminate some of the deepest puzzles of Niger-Congo languages in which--for example--the negation of clause involves pitch changes at discontinuous places? And could it, furthermore, suggest sources for some of the most pervasive of tone rules--such as a "flip" of high-low forms to low-high, etc.?

To begin with, such an attempt must be viewed as representing constructs designed only to show correspondences between current spoken forms (or as a generative base for those forms). My hope, however, would be that it would stimulate longer range study into the history of changes in the respective language families. For illustration of this approach--but with no guarantee of accuracy--I choose a fragment of Etung data (from Thomas Edmondson, who is studying the problem further).

I begin with a pair of illustrations plus their associated starred forms, which I shall then attempt to justify:

- (1) i) /á kà bá/ 'he (did) not come'
 ii) *(↑ + à + kà↑ + bá)
- (2) i) /á ká[!] bá/ 'they (did) not come'
 ii) *(↑ + á↑ + kà↑ + bá)

The setting up of a difference between à 'he' and á 'they' is based on a large amount of data in non-negative forms, such as (3):

- (3) i) à kǫ̀ gùré 'he is selling '
 ii) á kǫ̀ gùré 'they are selling '

The difference between kǫ̀ - kǫ́ is attributed to a raising influence associated with á↑ 'they' but not à 'he':

- (4) † + ` > ' !

It is important to note that this Etung raising influence is not a phoneme like the lowering influence /!/, since it merely causes the replacement of /`/ by /' + !/ (already in the system phonemically) and neither adds a new level, nor a conditioned variant of a level. It is a morphophonemic symbol, not a phonemic one. (For a raising influence analogous to the lowering /!/, which does achieve phonemic status, see § 6.2.5. Meier had suggested this possibility earlier, for Izi. In Etung, the kind of data giving rise to this possibility have not been found.)

The † before bá leaves it unaffected, since:

- (5) † + ` > `

(whereas the bá after `! of (2) develops an audible downstep of the !bá complex). Therefore morphophonemic raising influence residing in kǫ́† is not manifested--not detectable--in (2). Note, however:

- (6) i) á kǫ̀ rú!é 'he (did) not go '
 ii) * († + à + kǫ́† + rùé)
 (7) i) á kǫ́ rùé 'they (did) not go '
 ii) * († + á† + kǫ́† + rùé)

In (7) one finds the basic form of rùé, beginning with a low tone. When, therefore, the low of rù is replaced by high in (6), we deduce the inaudible presence of the morphophonemic † in the preceding kǫ̀. But when the low of rù is replaced by high, the † leaves its impact on rù, raising it to high. At the same time, however, the e of rùé is now heard in (6) as lower than the former-low-now-raised-to-high preceding it. All of these phonetic characteristics are represented phonemically by ... kǫ̀ rú!é, within the regular interpretation of /!/ as causing the high after it to be a bit lower than the one before it.

Note, therefore, that at this point there arises some hope of eventually explaining reversals such as ` to `, etc., in morphophonemic terms whereby a chain of elements affect the ones directly next to them. This would save some of the problems of explanation of tone replacements (which appear to be largely composed of assimilation phenomena) without requiring action at a distance. Explanation would then be in terms of the kinds of assimilative changes actually observable, currently, in fast versus slow forms, or across closely related dialects.

Two further problems, however, would remain: (a) The origin of † would itself have to be explained. This would now seem to comprise a reasonable research task. Can it, for example, by comparative techniques be traced to a lost high tone? Or does it suggest an easier way of searching for (or testing present hypothesis of) a phoneme of raising influence analogous to /!/ (cf. § 6.2.5)? (b) The second feature to be noted carefully is that such influences perhaps do not alter the relevant domains of level pitches in those languages in which several syllables in a row hang together (all up, or all down) in rules; and several syllables of a domain operate in the rules like a single-syllable domain in the same rules.

Returning now to (1) and (2) we note that † at the beginning of the formulas has not been justified. The added basic assumption here is that the transformation of

a positive clause to a negative requires changes at more than one place in the clause. This, however, is amply demonstrated in clause materials (see Chapter 1, § 1.1.2). And if this is granted, the assignment of a second morpheme (or part of a morpheme, in an alternate analysis) to the clause complex (↑ before the pronoun, in addition to the *kà*) seems no longer surprising. Yet it is precisely this (or other?) morpheme with zero phonemes but with significant morphophonemic impact⁸ which in part makes the negative appear so mysterious. Here, however, the ↑ plus third person *à* gives the *á* of (1).

Note, however, that we would have expected ↑ + *à* to give *á*, as in (4). How can this absence be explained? Note that the downstepping influence would then have preceded the low of *kà*, which it cannot affect since:

(8) ! + *à* > *à*

and therefore, for (1) (and including rule 5)

(9) *(↑ + *à* + *kà*↑ + *bá*)
 > *(*á*! + *kà*↑ + *bá*)
 > *(*á* + *kà*↑ + *bá*)
 > (*á* *kà* *bá*)

We would like, however, to find an instance where the implied

(10) *(↑ + *à* + *á*) > *(*á*! *á*)

with actualized downstep. This situation, however, is present in (6), where *kà* ↑ raises the first syllable of *rùé* to *rú[!]é* with the expected resultant downstep of the last syllable, which is high.

I have not developed these rules to cover much of the Etung data (Edmondson is working on a more extended analysis). I do hope, however, that this kind of approach will open the door to a new type of fruitful work in this area.

6.2.8. Theory of Phoneme Types as Item, Process, and Relation. I now wish to suggest that these studies of tone (differentiating tone phonemes-of-level, from tone phoneme-of-downward-influence, from morphophonemic non-phonemic symbols of raising influence) can be fitted into a deeper theoretical perspective and at the same time help to solve an old problem.

The general thesis: That phonemes may be of three types--item, process, and relation; that these in some sense are related, in turn, to tagmemic perspectives of particle, wave, and field. The specific claim: That "segmental" elements such as /o, s, t/ are particle phonemes, as items; "suprasegmental" elements of tone level, and of length, are field phonemes, as purely relational elements; that the /! / of Africa is neither a segment nor a relational pole of a sector of a field, but a wave (or process) phoneme.

Note that, in general, the particles--once the system is known--can in general be recognized in isolation, as 'things' in themselves. The field phonemes are recognizable by paradigmatic contrast in a frame; the frame shows contrastive relations within the subset of that field. The process phonemes are recognizable only in a sequence--in a phonological construction, or wave--in reference to what has happened to an item previously identified in the paradigmatic field.

The development of further implications of this view--and problems with the

⁸ See, for my earlier struggle with comparable problems, the 'zero word' of Mixtec, in my *Tone Languages*, p. 82.

well-known relational characteristics of segmental phonemes in a phonological matrix--I leave to another publication.⁸ This much, however, should indicate to the reader the deep theoretical significance of a special phoneme such as the downward influence /!/.

6.3. Segmental Phonemes. There is not space in this report to discuss at length the phonetic matters faced in the workshops in Ghana and Nigeria. Nor is it necessary to sketch the general picture for West Africa, which has been done so well and recently, by Peter Ladefoged.¹⁰ Here, therefore, I shall mention only a few special problems.

6.3.1. On the Phonetics of Vowel Harmony. Working closely with Professor John M. Stewart¹¹ on Twi, I was interested in attempting to suggest classroom drills which help students learn to hear and produce the difference between "close" versus "open" varieties of vowels. These sets are involved in vowel harmony, which is very extensive throughout the area of West Africa.

Stewart and I both operate on the assumption that it is the relatively forward versus back position of the root of the tongue--not height of the tongue dorsum--which is crucial to the contrast between, say, [i] versus [ɨ], [u] versus [ʊ]. Stewart's paper emphasizes the need for an added dimension--tongue-root fronting--as making the [i], [u] set marked; versus the other set unmarked. Linguistic morphophonemic problems of assimilation, he points out, could not be neatly handled otherwise. He also discusses at length the relevant literature.

My material, on the other hand, will--in a separate paper in preparation--show the relation of exercises for vowel production to the exercises formerly published in my Phonemics (1947). Spectrograms by Peck and Brend,¹² analyzing both Ashante Twi data (Mr. Denteh, speaker) and samples of my artificial drill material, show some of the kind of modification of height of the first formant which might be expected by the postulated changes in the throat cavity.

6.3.2. General Phonetics. Various specific problems of detail were met, during the project, which need further study in relation to the dynamics of larger phonological units.

The relation of the phoneme to the syllable: In Bette [kùk^uó] /kùk^wó/ 'road' appeared dissyllabic in contrast to the trisyllabic [ùkù.ó] 'bowl'. Here problems of k^wV versus kVV--long known--continue to require careful attention in analysis.

Another problem related to vowel and syllable is apparently the contrast between a downglide, fast, on a single vowel versus the same kind of glide, slow, spread over two vowels: /â/ versus /ââ/. Perhaps Abua furnished samples with obîñî 'river' versus oyîñ 'priest'. Such elements, it should be clear, imply the need of

⁸ See, now, my 'suprasegmentals in Reference to Phonemes of Item, of Process, and of Relation', To Honor Roman Jakobson, (The Hague, 1967), pp. 1545-1554.

¹⁰ In A Phonetic Study of West African Languages, an Auditory-Instrumental Survey, Cambridge: University Press, in association with the West African Languages Survey, 1964; West African Language Monographs 1.

¹¹ Whose paper on Tongue Root Position in Akan Vowel Harmony was read at the Sixth West African Languages Congress, Yaoundé, Cameroun, March, 1966.

¹² They cite H.K. Dunn, in "The Calculation of Vowel Resonances, and an Electrical Vocal Tract," The Journal of the Acoustical Society of America, 22, 1950, pp. 740-53.

careful handling of rhythm statements where--as in Abua--some degree of evenness is found for feet with differing number of syllables, or for syllables (in relation to feet) with differing number of vowels (see §6.1).

A problem of certain consonantal contrasts warrants continuing study: In Abua, the Gardners provide samples where I seem to hear phonemic contrasts between flapped versus nonflapped [l]. The flapped one appears to be shorter, weak, possibly shortening the preceding syllable; the nonflapped one appears to be longer, perhaps fortis, and affecting (lengthening), in its turn, the syllable before it. Note (with [ḷ] as the longer, fortis, nonflap types, [l] as flapped):

[òḷ·à] 'bangle', [òlà] 'intestines'.

6.3.3. On Data Collection Preparatory to Workshop Analysis. For any report such as that of the preceding section, the experienced analyst may retain a certain amount of reserve. Sample, isolated illustrations--no matter how contrastive and relevant they may appear--sometimes disintegrate under closer scrutiny. A supposed minimal pair, for example, may in fact contain a factor unnoticed, which makes the pair nonminimal and cuts all support from the analysis.

The reader may very well wonder, therefore, what kind of basic, solid tests are made in workshops such as those reported here, to minimize such sources of error in the phonemic work of some of the analysts who are in the early stages of investigation. And how, furthermore, can the data be checked rapidly--since time is limited--and problems isolated which warrant study in depth.

The approach--which I first applied extensively, in this particular form, in workshops in Peru in 1955-56--calls for the lining up of data in a specific format: Sounds which are similar, and subject to confusion in analysis (giving 'suspect pairs' of sounds) are in each instance, for example, lined up with hypotheses as to their contrast or as to their complementation, and accompanied by contrastive word lists--and preferably with tape recordings. Segment sequences (like ts) which in general experience are known to be unit phonemes in some languages, but sequences of phonemes in others, are required to be listed with arguments pro and con, supported in turn by data. Distributional patterns and lists--necessary for decision as to consistency or proof of statements of complementation or contrast are added.

Charts of phones and of phonemes show the patterned development of the analysis. Frames, for tone contrast, also lead to illustrated statements of morphophonemic rules and patterns of tone behavior.

With data before him in this form, the consultant¹³ is able to check and utilize the underlying data rapidly--far more rapidly than he can do so from the standard professional article on the same data--and suggest further work.

The body of this report does not allow a full illustration of this type of data collection.¹⁴

6.4. Intersection of Voice Quality with Gesture. Miss P.M. Revill attempted to go beyond routine linguistic analysis in Mbembe, by studying features of voice quality, speed, and rhythm with the expression of emotion.

¹³ Or a later scholar or pedagogue who wished to work with informants in the same language.

¹⁴ Samples are available in field reports of the Summer Institute of Linguistics. See, for example: John Callow, Collected Field Reports on The Phonology of Kasem, Accra, The Institute of African Studies, University of Ghana, 1965, or the prepublication form of this report, for Agbo.

To her surprise, however, it became evident that the contrast between certain strong emotional states was in part carried by verbal cues and in part by nonverbal ones. It was only by the intersection of vocal and gestural systems that some of the emotional states could be recognized and differentiated.

Specifically, for example, both anger and surprise were breathy, fast, and with low pitch on the final phrase. Yet portrayal of anger included fast nods of the head, with eyes rolling and flashing--characteristics not present with surprise. On the other hand, a surprised exclamation was accompanied by a quick movement of the hands, with palms upwards, whereas anger was accompanied (contrastively) by fast pointing gestures. For the details of this report--still in its preliminary stages--see Appendix II.

VII. IMPLICATIONS OF MATRIX APPROACH IN PEDAGOGICAL PLANNING

How can a person effectively learn a language, preparing his own textbook, when he has neither teacher nor analysis available? This question was relevant to some persons in attendance as guests at part of the workshop. Their interests lay in techniques of language assimilation rather than in those of analysis.

In order to lead them to see the kind of problem they must solve, I inquired: What don't you know? When, of course, they could not answer this question (which might have appeared unreasonable to them), I then asked: If you don't know what it is that you don't know, how can you build lesson plans to teach yourself those points?

The implication: (1) There is needed some way of guessing at the presence of areas of analytical ignorance, so that (a) research can be undertaken in these areas and (b) drills be set up for assimilating available data. (2) In some sense this must be a "bootstrap" operation--i.e., the construction of drills for assimilation cannot wait for a full analysis; analysis and assimilation need to proceed together. The problem is to demonstrate how this can be done at all, and--preferably--how it can be done smoothly.

The start: memorization and simultaneous acting out of dialogue in cultural contest. Language behavior and nonlanguage behavior must be learned as a unit (see paralinguistic tie in § 6.4). A universal genetically determined seems to be the fact that human 'computers' are designed to learn language as part of other behavior--perceptual as well as social, etc.--and function very inefficiently when language is abstracted from life. My belief: Language neither begins nor ends with or within a context of sentences, but within a setting much larger than language itself, with perceptual contrast and linguistic-structure contrasts learned together. But the 'learning-together' is not the learning-at-the-same-time of disparate, disconnected, logically-separate events, patterns, rules, or habits. Rather, the togetherness is a logical dependency, the mutual entwining of axioms, definitions, and patterns: A thing, cow, as different from the thing, horse, may be learned at the same time as the difference between words "cow" and "horse"; neither concept nor word can be experientially, logically, or linguistically completely disentangled the one from the other. (Note: I am not saying that language determines behavior, nor that behavior determines language, but that nonverbal and verbal behavior are in some sense a single package, with partially independent and partially dependent relationships.)

Such a behavior-integrated language view requires the discourse to be treated as more basic than any isolated sentence, since it is through the larger context that nonverbal and verbal behavior are entwined. Communication (as in the paralinguistic data of § 6.4) involves both. Does one know how to act in typical situations?--typical here referring to genetically-conditioned, expectable behavioral universals of eating, socializing, and the like? This question can therefore substitute in a larger sense for the question: What don't you know?

The transfer to linguistic search is immediate: Have I found linguistic structures (which must be there, for reasons just given) which allow me to discuss the needs or culturally-prescribed techniques of eating, or of discourse itself (with the presence of language as metalanguage being part of the genetically-prescribed and expected language potential)? Or: Have I found the means for expressing relations between the dramatis personae of a 'plot' (i.e., of a situation) in linguistic terms? Or: What are the linguistic correlates of actor, action, benefactee, etc.?

Since the presentation of these dramatis personae can be equated with components of linguistic structures, and more especially with tagmeme units (though also through lexical terms-- as we have just employed the term "benefactee", for example), it follows that early search for crucial areas of behavior-ignorance can be achieved, heuristically, by an attempt to match guessed-at plot-universals with known devices.

When a gap appears-- say the inability to express the instrumental in the target language-- the analyst searches (through elicitation by translation, or through building tales, or by hunting through a recorded corpus) for the expected presence of the component in various linguistic levels, areas, structures.

The first guess, for the place of expression of some components, will depend in part on the cultural accident of the analyst's background. Both his native language and his linguistic sophistication and biases will color his early guesses. For the linguist with tagmemic tools available, however, effective guessing emphasizes two parts:

(1) He will attempt to elicit basic clause structures, in the forms of a syntactic paradigm. Some plot relations will be found expressed as simple expansions of (optional tagmeme additions to) the basic clause patterns. Others (like the instrumental in Twi and Vagala, § 1.1.1 and § 2.2.4) may only be expressed by moving to structures on a different level.

(2) The learner will also attempt to set up matrices of clause types (and of other constructional levels). Irregularities here-- holes in the pattern, or dangling, unintegrated bits-- suggest search for the possibility of regularity. For example, if a declarative statement is found both independent and dependent, but interrogative is listed only as independent, the analyst might well search for a possible dependent interrogative.

Provisional lesson plans, then, can be built from the beginning of a knowledge of how to play-act and word-act. Discourse in play-act context can be memorized before analysis is finished. Drills can be set up using sample clauses, phrases, sentences from the discourse as frames for substitution drills. Expansion drills can exploit the addition of optional tagmemes of a construction. Discourse drills can be patterned on minimum speaker exchange (e.g., standard question-answer techniques). Derivation of complex from simple matrices, when known, show transfer of dramatis personae plot relations from one structure or level to another¹ (or, in other theoretical terms, transformation drills can be set up).

The advantage in the pedagogical presentation, here, is the potential for a linguistic bookkeeping which allows one more easily to see just how much has been presented, relative to the partially-known system in each lesson, and in the sequence

¹See Kenneth L. Pike, "Discourse Analysis and Tagmeme Matrices," Oceanic Linguistics, 3, 1964, pp. 5-25.

of lessons. If one keeps in an appendix a set of syntactic paradigms plus a set of matrices, each paragraph of the lesson can be keyed to the paradigms and matrices, and--in turn--these latter may have for each tagmeme and for each matrix cell a section number showing where in the text each item has been presented, drilled, expanded, and related to other structures from discourse to word.

Such an index meets the requirement raised at the first of this section. It allows the beginning analyst-learner² to know, in principle, what he knows; to guess at gaps; and to keep track of his assimilation responsibility toward what he knows analytically. In addition, it would vastly simplify the task of a textbook writer of a 'second-level' text by letting him see, directly, something of the structural rationale and developmental sequence of the data inherited from the writer of the first level.

²See, now, Herbert Stahlke and Ruth M. Brend, "The Use of Index Matrices in the Preparation of Language Textbooks," Language Learning, 17, 1967, pp. 37-44.

VIII. SUMMARY

Chapter 1: Studies are reported for certain Niger-Congo West African languages: Kasem, Vagala, Sisala, Dagaari, Bimoba, Basare, Twi, Bariba, Degema, Engenni, Igede, Izi, Abua, Mbembe, Agbo, Bette, Etung, Yachi. (Secondary sources are used, also, for Bobangi [Bantu] and Hausa [Chad, Afroasiatic].)

Clauses may be basic, or derived, described in reference to contrast, variation, and distribution.

Chapter 2: Clauses differ according to the place they occur in the sentence. In addition, clauses enter into specialized, characteristic clusters (serial clauses), within these sentence parts. Clauses in clusters exhibit special variants, loss of tagmemes, and co-occurrent restrictions. These processes lead to semantic specialization of subclusters; development of verb phrases; and classes of verbs seen as in a state of change. Some tagmemes and some clause variants expected by the English speaker to occur within the separate clause are expressed only within the clause cluster or subcluster. (See, also, § 1.)

Chapter 3: Sentence clusters (= paragraphs) show, on a higher level, structural restrictions and relations analogous to those on lower level clusters. Nuclei of paragraphs (topic sentences) are structurally analogous to the independent clause of a sentence. Detailed study of discourse will apparently show similar kinds of structure, of which only the first bits are reported here.

Further kinds of discourse-tie involve the intricate relation of prescriptions for the choice of direct versus indirect quotation according--for example--to "on-stage" versus "off-stage" focus, status of speaker (chief versus commoner), involvement of dramatis personae (as speaker versus addressee, for example).

Chapter 4: Noun phrases, like clauses, can be described and compared as to type, by techniques of presentation in syntactic paradigms. Some noun phrases, like clauses, can be seen in process of change to a lower-level construction.

The matrix treatment of nouns allows irregularity to be seen as distortion of a simple field structure, and lays the groundwork for comparison across languages. Concord of noun to other tagmemes of a clause, seen via matrix, sometimes shows ordered regularities of a ranking type.

Chapter 5: Matrix presentation of verb structures allows the clear exhibition of highly complex rules of fusion by ordered change from simple matrix to derived matrix.

Chapter 6: Phonological study, to show the deeper underlying characteristics of these systems, must include relation to feet, in dynamic sequence (often in isochronic units with a varying number of syllables).

The tone systems of the area are observably in a state of change. A special phoneme of process--a lowering (or "downstepping" influence--is characteristic of the region, and leads to a modification of phoneme theory to accommodate phonemes of particle (or item), of wave (or process), and of field (or relation). Segments like

/s, o, l/ would be phonemes of a particle type; high versus low tone would be relational elements of field; and the /! / lowering influence would be a phoneme of process (distinct in phonological result from a hidden morphophonemic influence). Combinations of the three types, plus morphophonemic symbols, suggest special results for internal reconstruction of tone chains. In many of them a new, extra-high tone can be seen in a limited set of special contexts (e.g., the negative). Otherwise, basic, contrastive tone heights vary in number from two to four.

Segmental phonemes involve various problems--including the role of the throat in vowel harmony.

Vocal quality comprises one component of certain cues to emotional states. Certain ambiguities can be resolved only by the intersection of these cues with gestural ones.

Chapter 7: For the learning of a language before the analysis of that language is well along, tagmeme and matrix techniques allow for a bootstrap operation in which learning and analysis proceed simultaneously. Index matrices permit the textbook writer to keep track of the areas taught and those still to be taught--whether in a first text or on an advanced level.

APPENDICES

Appendix I

GRAMMATICAL PROSODIES ??

John T. Bendor-Samuel

Can any features be found within a grammatical system which correspond to the prosodies found in a Firthian type of analysis of a phonological system¹? To answer this question we must first ask what phonological prosodies are². What features of the phonological structure are handled as prosodic?

Prosodies in Firthian analysis are phonological features which either extend over more than one segment of a structure or have implications over more than one segment. Either they cannot be adequately assigned to a single segment or, alternatively, if occurring as an isolatable single segment they have an implication for the structure as a whole, e.g., marking the boundary of a phonological word. This second type of prosody resembles Trubetzkoy's 'Grenzsignale'.

Are there grammatical features which parallel this? First, are there grammatical features which can be said to extend over more than one segment in the grammatical structure? Such a question presupposes that it is possible to set up grammatical segments which correspond to the phoneme segments of phonology. Any given grammatical structure can be viewed as a series of units in certain relationships to each other. Each unit would correspond to the phoneme segments in phonology. Thus a clause can be viewed as consisting of phrases and a phrase as consisting of words. The segments of the clause would then be the phrases and the segments of the phrase the words.

The question would then be, are there grammatical features which extend over more than one phrase in a clause or over more than one word in a phrase? As a rather simple and limited example, the singular/plural contrast extending over both the nominal and the verbal phrase in an English clause might be adduced, as in

The boy is eating.

The boys are eating.

The contrast singular/plural can be seen to extend beyond the one phrase and, in fact marks both the phrases which can be said to make up such a clause. The clause can then be said to be marked as singular/plural and a grammatical prosody of singular/plural could be set up.

¹This note arises, in part, from the two workshops conducted by Dr. K.L. Pike under contract 5-14-065 of the U. S. Office of Education, through the Center for Research on Language and Language Behavior, of the University of Michigan. The underlying research on West African language has been carried out as a member of the Summer Institute of Linguistics in association with the Universities of Ghana and Nigeria.

²For an introduction to the theory of prosodic analysis see J.R. Firth, "Sounds and Prosodies," *Transactions of the Philological Society*, 1948, pp. 127-152; and R.H. Robins, "Aspects of Prosodic Analysis," *Proceedings of the University of Durham Philosophical Society*, Volume I, Series B, No. 1 (1957). For an example of this type of analysis applied to a language, see my "Some problems of segmentation in the phonological analysis of Terena," *Word*, Vol. 16, No. 3, pp. 348-355 (1960).

The usefulness of such an analysis in English is rather reduced by the fact that the object nominal phrase is also marked by the singular/plural contrast as in

The boys are eating the melon.

The boys are eating the melons.

So there would still have to be a category singular/plural at the phrase level as well as the clause level.

A much more extended and convincing instance of this occurs in languages with a 'concord system'. In Etung,³ phrases such as the following occur. (Hyphens mark morpheme boundaries and tone is omitted):

e-yu	jɪ - t	bi - yu	bi - bae
yam	one	yams	two
e-yu	an - ji	bi - yu	am - bi
yam	that	yams	those
e-yu	ej - e	bi - yu	eb - e
yam	his	yams	his
e-yu	n - ji	bi - yu	m - bi
yam	this	yams	these
ŋ-kae	yo - t	o - fak	bɪ - t
wife	one	broom	one
ŋ-kae	ow - e	o - fak	ob - e
wife	his	broom	her
ŋ-kae	n - ño	o - fak	m - bi
wife	this	broom	this

Each phrase consists of two words, and each word includes a prefix or suffix. The type of analysis proposed here would state that such phrases consist of two main elements (the two words), together with one of a series of concord prosodies. These concord prosodies are realized by the affixes. The selection of one out of the set of concord prosodies is determined by the class of the noun head of the nominal phrase.

Concord in Etung extends beyond the single phrase to include nominal and verbal phrases. Clauses such as the following occur:

e - yu	jɪ - t	e - man
yam	one	is finished
bi - yu	bi - bae	bi - man
yams	two	are finished
ŋ - kop	yɪ - t	a - man
box	one	is finished
o - fak	bɪ - t	o - man
broom	one	is finished

The concord prosodies extend over the subject nominal phrase and verbal phrase. Thus the clause as a whole is marked by the concord not just the phrase. In a full treatment of Etung it would be necessary to state these concord features as operating as a feature of certain clauses and phrases.

Another type of extension occurs in clauses in Bimoba⁴. A conditional clause

³ I am indebted to my S.I.L. colleagues, Mr. and Mrs. T. Edmondson, for the Etung material used in this illustration.

⁴ For further details of this and the other Bimoba examples quoted in this note, see my "Problems in the analysis of sentences and clauses in Bimoba" to be published shortly in Word. I am indebted to my colleague, Miss G. Jacobs, for the Bimoba material.

is identical in structure to an independent clause, except that it is marked by the particle i and/or tii which occurs after the nominal phrase subject and before the verbal phrase, together with a low tone on the final syllable of the clause. Sometimes the particle i occurs more than once in the clause, occurring as the final syllable of some of the verbal particles. The combination of particle(s) and low tone must be regarded as the exponent of the single grammatic category of 'conditional'. Instead of considering such a particle as a unit of the structure of the clause, which would raise problems since it is clearly not a phrase, it is simpler to regard it as a part of a type of grammatical prosody. The prosody would include the repeated occurrences of the i particle and the final low tone.

Examples:

kɔjok i dii napayɔ gbennì ɲoi saa mək n bik
 cock if cat stone one finish he future have (marry) my child (daughter)
 na
 this

'If the cock finishes eating one stone, he will marry my daughter.'

m i bo i biak i saa saɔ Naleatùk lə bə sii ɲan
 I if should again future go Nalerigu it would future be better
 'If I were to go to Nalerigu again it would be better.'

What of the other type of prosody--that which, though not extending over more than one segment, has implications for the structure as a whole?

In many West African languages there are particles which can be regarded as playing just such a role. To take another Bimoba example, the general subordinative clause is marked by the particle a (after pronouns) or mba (after nouns). It is difficult to describe these particles as being either themselves phrases or as being a constituent part of any other phrase in the clause. To assign them to the nominal phrase or verbal phrase seems quite arbitrary and their function is to mark the clause as a whole. This point is further illustrated since, when a series of verbal phrases combine to make a serial clause, the particle only occurs once. These particles may then be said to have an implication of subordination for the structure in which they occur. This is, in fact, the only way in which many subordinative clauses are distinguished from other types of clause. Instead, then, of giving them the status of grammatical units it seems simpler to handle them as grammatical prosodies.

Examples:

u a won wuur gbenn tə won ɲɔɔb tə sanjook
 he yesterday washed finished we yesterday took out road
 'Yesterday as he finished washing, we started on our way.'

bantɔɔ nba din poon ɔ na u din wɔb nɔɔ pɔnter
 crocodile remote made him he remote put on with frog
 past cross past back him

'As a crocodile made him cross the river, he put a frog on his back.'

In many languages a problem often arises as to where segmentation into grammatical units should be carried out. Take, for instance, the English phrase 'cats and dogs'. Clearly the two main units in the construction are the two nouns. What

of 'and'? Is it a third unit? If so, what is the status of 'and' in the phrase 'men, women and children'? To treat it as merely the third unit in a string of four equal segments seems inadequate since, though its physical realization may be after the second noun, its function is to link the first noun to the second just as much as the second noun to the third. In fact, it signals the co-ordinate relationship of all three nouns⁵. Furthermore, what is the status of 'and' when linking two clauses? It can hardly be regarded as belonging to either of the two clauses. How much simpler to regard 'and' as a feature of the construction as a whole marking the co-ordinate relationship of the main elements concerned.

The term 'grammatical prosody' may be ill-chosen. Prosodists may disown it. 'Syntagmatic features' might be a less provocative term. What ever the label, however, it seems there are grammatical features which are not well handled by the usual segmentation into constituent parts of the construction. Let them be handled as features of the total structure and not forced into an arbitrary segmentation.

⁵ Compare R.S. Pittman's treatment of conjunctions in "A grammar of Teteicingo (Morelos) Nahuatl," Language Dissertation No. 50, 1954. In setting up the category of 'valence', in contrast to morpheme, he regards conjunctions as 'valence-carrying' morphemes. Valence is used particularly for the relationship between two immediate constituents, whether overtly or covertly expressed. Conjunctions would exemplify overt valences carried by morphemes.

Appendix II

PRELIMINARY REPORT ON PARA-LINGUISTICS IN MBEMBE (E. NIGERIA).

P. M. Revill

- Aims:
1. To report on preliminary work on the linguistic and non-linguistic signals of emotional overtones in Mbembe.
 2. To indicate the direction of subsequent work.

1. Report on preliminary work.

1.1. Methods of Approach. Initially, in order to avoid a biased interpretation of emotional overtones in elicited material, a recorded text was taken as a basis. An informant was questioned on his interpretation of the speaker's feelings at certain points. Specific emotional overtones emerged in certain utterances, and the informant was able to point out some of their characteristics and contrast them with the same utterances in normal speech patterns.

Secondly, the informant was asked to use utterances from text material and elicited utterances to demonstrate the effect of certain emotions on pitch, voice quality, and other linguistic features. He also demonstrated certain non-linguistic features, such as gesture or facial expression, which might accompany these utterances. In each case when an utterance was elicited a situation was described which might be expected to give rise to emotional overtones in speech. The situations used are noted below.

Subsequently in this report observations arising directly from unelicited text material (i.e., the first method described above) will be marked "A", those arising from the second method will be marked "B".

1.2. The initial findings have been recorded below under general headings of the emotions displayed.

- 1.21. FEAR ↑
A
↓ Situation. Nervousness at speaking into a recorder. "He is afraid; he has never seen such a thing before."¹
Linguistic signals. Tense voice quality and slow speech. Short forms will be used (e.g., *ńtómá* 'I begin?' versus *ńtómá - ò* 'I begin', question marker).
Non-linguistic signals. "You will hear it in his throat"; i.e., gasp for breath before speaking. "He will tigt himself"; i.e., sit hunched up without moving.
- 1.22. ANGER ↑ Situation 1. A command had been given and disobeyed, the speaker is angry and wishes to enforce the command. Linguistic signals. Voice quality will be breathy, either throughout the utterance or on the final syllables. Faster and more intense speech than normal. "You will speak fast"; "you will speak with power". The pitch will be

¹Quotations are from informant's comments.

lowered on the final syllables. (Phonemic tone contrasts are preserved within this.)

B Non-linguistic signals. Almost invariably signalled by fast gestures; e.g., in the command kwú 'Come!' there will be a swift beckoning movement with one hand. In a longer command there will be a movement of the whole arm with the finger pointing downwards, "to show that you must do it". In certain contexts the linguistic features of anger may not be distinguishable from those of general excitement but, "they will know by your eyes whether you are angry or surprised". I.e., The eyes open wide and the eyeballs roll. "You may nod your head"; i.e., fast.

Example showing pitch contrast

Elided form with intonation and phonemic tones.

Unelided form.
Meaning.

a) Normal speech.
ókwótúmǎvá:nǎ píróčí

ókwú ótúm ǎvá:nǎ pírà óčí
he-comes he-should-dash [=give a tip to]
chief before he-eats

b) Angry speech.
ókwótúmǎvá:nǎpíróčí
Breathiness

↑ Situation 2. (Volunteered by informant.) The speaker has taken to the edge of a deep pit and has been told to jump down into it.

Linguistic signals. In a situation such as this, which causes distaste and horror, in addition to the phenomena of voice quality, pitch, and speed noted above, the exclamation cá will be used. This morpheme has no translatable meaning

B but it is used frequently in the language to signal distaste or merely surprise. When it signals distaste it may include an extra syllable, ci:á. The exclamation wó may be used for something surprising, but it will never be used to signal distaste. (See 1.25 below)

Non-linguistic signals. With the exception of gestures specifically used in command, the non-linguistic signals mentioned in situation 1 will occur. In addition, the speaker will shrug his shoulders when using an exclamation.

1.23. RESPECT

↑ Situation. The informant was asked to make the words of the example in 1.22 a request to a chief or older man.

Linguistic signals. The respectful utterance is always spoken slowly and quietly. There is a tendency to glide the phonemic tones giving an undulating effect over the whole

utterance. The final syllables will bear low pitch and may be preceded by juncture.

Non-linguistic signals. A slow nod of the head and a movement of both hands away from the body, the wrists turning and finishing with the palms of the hands facing upwards.

The beckoning gesture with kwé: 'Come!' ² will be slight and slow.

Example.

Elided form with intonation and phonemic tones.

Unelided form.
Meaning.

a) Normal speech.

ókwótúm ðvá:nón̄ p̄rórócf

ókwú ótúm ðvá:nón̄ p̄rà ócf
he-comes he-should-dash chief before
he-eats

b) Respectful speech.

ókwótúm ðvá:nón̄ p̄rà ócfé²
+ — + —

Elided form showing junctures.

1.24. SORROW

Situation 1. A friend has promised to come on a visit, but he has not done so. Situation which might cause disappointment.

Linguistic signals. Voice quality will be breathy on the final syllables of an utterance. These final syllables will be spoken quietly, will bear extra low pitch and may be preceded by juncture. There may be strong accent on the syllable preceding the juncture. The exclamation ð: may be used in such a situation as an expression of sympathy. The slow form ci:á may be used to express disappointment and annoyance.

Non-linguistic signals. "You will hear how you breathe." I.e., there will be a sighing intake of breath before speech.

Example.

Elided form with intonation and phonemic tones.

Unelided form.
Meaning.

wùròbèn bók'kwú kók'kwú cyá
+ +

wùrà òbèn bē òkwú kók'kwú cyá
he-said that he-come neg-he-come cya!
(he did not come)

Situation 2. A situation in which distress rather than disappointment would be called for, such as the death of a friend.

Linguistic signals. The same linguistic signals will be pre-

² See section 1.26 a) iv

B sent as in situation 1. except that the exclamation ñsò: will be used to express sympathy with the relatives and a high, tense exclamation wó or kwá will be used in hearing the news.

Non-linguistic signals. The speaker will beat the fist of one hand into the palm of the other.

1.25. EXCITE- Situation 1. The climax of a story.

MENT

Linguistic signals. Wide relative pitch intervals, with extra high pitch and marked crescendo on one word or syllable in the utterance. Voice quality will vary between breathiness on the low soft portions and clear intensity on the high crescendo portions. Pauses between intonation groups will decrease in length as the high climax approaches.

A

↓

Example. (from text) Spacing between groups indicates length of pause.

Elided form with intonation and phonemic tones.

ñwàwá b̀r̀òb̀l̀r̀é m̀ǹ:á òkwú

Unelided form.

ñwàwá b̀r̀òb̀l̀r̀é m̀ǹ:á òkwú
child small thus he-came

Meaning

mákwùb̀é	òb̀l̀r̀òkwú	mákwùb̀é	mátètè má	pl̀rà ǹǹàb̀è ǹé	cóníńá
mákwùb̀é	òb̀l̀rà òkwú	mákwùb̀é	mátètè má	pl̀rà ǹǹàb̀è ǹé b̀é	cóníńá
they-drove-him (away)	he-came-again	they-drove-him	plenty before they-say-that		let-him-stay

òńfńá
òńfńá

he-stayed

↑ Situation 2. The speaker expresses surprise at someone's action.

Linguistic signals. There may be wide relative pitch intervals, and it is usual for one word or syllable to be extra high. This word may also be lengthened and stressed. Certain lexical items appear frequently in this climactic position, e.g., mápyír 'all', mátètè má 'plenty'. (When mápyír is used indicating surprise it will be lengthened on the first syllable má:pyír 'all'; when it is used in a story it may be lengthened stylistically on the second syllable-mápyí:r.)

B

Also, as in situation 1, there will be breathiness on those parts of the utterance which bear a low pitch intonation pattern. The exclamations wó or cá (short fast form) may be used to express surprise (e.g., "if you hear that one of your friends has been arrested.")

B

Non-linguistic signals. When the word ma:pyir 'all' is used (i.e., as lengthened in conversation not in narrative) the finger will be drawn across the mouth.

Example.

Elided form with intonation and phonemic tones.

ònòŋòfèbébá òcf má:pyír (gesture)

Unelided form.

ònòŋ òfò èbébé òcf má:pyír

Meaning.

man he-killed cutting-grass he-ate all!



Situation 3. The police are looking for a man, causing general excitement. The informant was asked to show how in such circumstances he would tell someone in secret where the man was. The situation therefore implies excitement and secrecy.

Linguistic signals. Throaty, intense voice quality. Wide relative pitch intervals and accent on the climatic word.

Non-linguistic signals. Pointing may be with the finger or with the chin or both.

Example.

Elided form with intonation and phonemic tones.

a) Normal speech.

ósénsí ðùŋfè: tá:ŋá

Unelided form.

óséŋ sá ðùŋfè sè étá:ŋá

Meaning.

he-went there room his inside

b) In excited speech.

Elided form.

ósénsí ðùŋfè: tá:ŋá

1.26. Forms dictated by social situation.

Some forms have been found which cannot be described as reflecting feelings on the part of the speaker, but they will be used in certain social situations.

a) Final feature -é:/l



(i) This will be used in story-telling or in a village announcement to give emphasis to certain statements; e.g.,

òvá:nòŋ ònŋf é:

chief was

'There was once a chief...'

ókwo'túmòvá:nòŋl plrà ócf:

he-should-come dash chief before he-eats

(i.e., general announcement to the village).

(ii) It is used in conversation to ensure better understanding on the part of the hearer. It is frequently employed for this purpose in speaking to a child or to a foreigner. If an utterance has been misheard it will be repeated with the final

feature attached, and the final feature will be heavily stressed; e.g.,

B ɪ̀nð:nɪ̀
 bird (it is).

(iii) The use of this form for emphasis may be associated with distance from the speaker to the hearer; e.g., the form í: 'yes' will be used when speaker and hearer are close to one another. At a distance of about 12 yards or more the form íyè: will be used for 'yes'.

(iv) The final feature also has a polite connotation and will be used, for instance, in summoning a chief with the word kwé: 'come!' (cf. kwú 'come!' familiar, non-emphatic form).

(v) The use of the final feature may indicate cheerfulness or playfulness, in which case it will be lengthened and spoken in a singing tone.

b) Use of unelided forms.

When speaking to a foreigner many speakers will use unelided forms; e.g.,

òsɛ̀ŋ sɪ̀dũ̀ŋó sɛ̀:tá:ná

he-went there-room his-inside.

It is interesting to notice that the unelided form will not be used in speaking to a child.

2. Direction of subsequent work.

The above findings show the result of very preliminary work using one informant and recorded text material mainly of the narrative type. Further study would need to include observations within the real cultural situation and the use of recorded conversations. The present study takes no account of the degree of emotion shown or of variation between individual temperaments.

The observation of section 1 may be helpfully summarized in Matrix form. Such a display will indicate areas in which ambiguity might arise unless the cells of all the matrices were examined. Three linked matrices are shown, the vertical parameter of the linguistic and non-linguistic matrices shows the various emotions, the horizontal parameter shows linguistic and non-linguistic emotional signals respectively. Below these two matrices is a third showing the effect of social situations superimposed on the emotional situations.

Subsequent work might be expected greatly to increase the complexity of the matrices. The accompanying chart shows how the area of linguistic ambiguity between anger, distaste and excitement is cancelled by the application of the non-linguistic matrix. The addition of further matrices and of details within existing matrices would be expected to reduce further the possibility of ambiguity.

Key to Symbols on chart.Linguistic signals

- B - Breathiness
- Lf - Low on final syllables
- Q - Quick intense speech
- WI - Wide relative intervals
- LC - Length on climactic word
- AC - Accent on climactic word
- AJ - Accent preceding juncture
- JF - Juncture before final low syllables
- S - Slow speech
- G - Gliding pitches
- SS - Slow soft speech
- T - Tense
- L - Lengthening of all syllables

Social Situation

- M - Mime
- EH - Exaggerated hand movements
- é:A - Accent on é:



Area of linguistic ambiguity

Non-linguistic signals

- E - Eyes open wide and rolling
- QP - Quick gestures, pointing
- QN - Quick nod
- S - Shrug shoulders with ci:á (exclamation)
- I - Intake or sigh before speech
- B - Beating fist of one hand into palm of other
- H - Gesture of both hands with palms turning upwards
- SN - Slow nod
- IG - Gasping intake of breath

NON-LINGUISTIC SIGNALS

EMOTION

LINGUISTIC SIGNALS

PHONOLOGICAL				LEXICAL	GRAMMATICAL	FACE	HANDS	HEAD	BREATH	BODY	SOCIAL SITUATION
Voice quality	Pitch	Length & Accent	Juncture	Exclamations etc.							
+ B	+ LF		+ Q			+ E	+ QP	+ QN			
+ B	+ LF		+ Q	+ ci:á						+ S	
+ B	+ WI	+ LC + AC	+ Q	+ wó ca	+ mápyír mátètéma						
+ B	+ LF	+ AJ	+ S	+ ð ci:á					+ I		
+ B	+ LF		+ S	+ úsd: wó kwá			+ B				
	+ G		+ SS				+ H	+ SN			
+ T		+ L	+ S		shortened forms.				+ IG		
		+ -é: A		+ -é:			+ EH				Emphasis Repetition
				+ -é:							Emphasis Clarity
				+ -é:	+ unelided forms		+ EH			+ M	Foreigner
				+ -é:			+ EH				Child