IGBO TONOLOGY

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Igbo is a "terraced level" tone language. Its tonal system may be described in terms of two tonemes, high and low, plus a phoneme "down-step". In alternating high and low levels (each of which may continue for one to several syllables), each high level is automatically a little lower than the high level before the preceding low. The phoneme "down-step" occurs only between two high tones, and has the same lowering effect on the following high level that a low tone would have. (This is not necessarily to be construed as equating downstep with a deleted low tone. Such an identification is possible for some occurrences of downstep, but there is no direct evidence for it in all cases.)

Thus the first high level in a sequence between pauses is the highest. After either low or downstep, the next high level is slightly lower, and so on up to a pause. It is never possible to go from one non-low level up to a higher non-low level. Hence the analogy of terraces, but these terraces may sometimes be separated by a deep ditch (low tone).

In the following, all high tones are marked '/' over a vowel or syllabic nasal. All low tones are marked '. Downstep is marked '/' before the first or only syllable to which it applies. This material, a section of a volume in preparation on African language structures, discusses problems arising from the fact that, while Igbo stems and many affixes have lexical tone, their lexical tone often undergoes alternation of some kind.

1.

When different tones accompany the consonants and vowels of a number of morphemes in a language under different circumstances, it is not always immediately apparent whether it is morphotonemic alternation under definable conditions, or the presence of a tonally realized morpheme, that is responsible for the variation. In some cases, both
may be present. Igbo provides some interesting complications in the identification and interlocking functions of morphotonemic alternations and tonally realized morphemes; a few details restricted to relatively uncommon constructions or to individual words with a unique structure are omitted in this treatment, but all of the relevant principles of analysis and interpretation are amply illustrated. It is recognized that there are dialect differences in some details, but the statements made here represent patterns that are known to be widespread. For other dialects, an occasional statement would have to be omitted, added, or modified, or the order in which some statements are made would have to be changed. A few conspicuous dialect differences are noted. This section is confined to a few details of tonal identification and behavior which can then be assumed in the remainder of the discussion.

a. First, there is a set of independent pronoun forms which in most respects function as nouns. Three of these are monosyllabic, and in their underlying structure are interpreted as having initial downstep followed by high tone. The initial downstep is, in all probability, historically derived from a vowel with low tone. The six forms are:

(1) ǹmụ 'I'  bụnyị 'we'
    'gị 'you (sg.)'  únụ 'you (pl.)'
    'yá 'he, she, it'  hà 'they'

Downstep with the monosyllabic forms is shown in the following:

(2) ọ bụọ 'yá byàrà
    'if it is he (who) came'

These forms are also used as possessives. Downstep with the monosyllabic forms is again attested; after low tone, of course, downstep is automatically deleted. E.g.

(3) ọwụ 'yá 'his goat'  ọgụ yá 'his house'

b. As verbal objects, the same forms are used except for the first person singular, which is a syllabic /m/. This and the other three monosyllabic forms have downstep-high after high, but in the particular
dialect under consideration have the alternant tone low after low. E.g.:

(4) ő kpő 'm
    'if he calls me'

he called me'

c. As verbal subjects, the plural forms listed above are again used.
There are, however, special singular subject pronouns. The second person form is /i/ or /I/ (the choice depending on vowel harmony). The third person form is /ő/ or /ő/. In some constructions, the first person form is /h/. In other constructions, the first person form consists of /ő/ or /ő/ before the verb plus a syllabic /m/ after the verb; the tone of the latter is downstep-high after high, but low after low.
E.g.:

(5) ő mé 'yá
    'if you do it'

ő bű ló
    'it's a pot'

m mé 'yá
    'if I do it'

ő mé 'yá
    'I have done it'

ő hůr 'm yá
    'I saw him'

Perhaps to be identified with the vowel component of the first person form above is an impersonal subject pronoun, /ő/ or /ő/.

d. In negative constructions, with subjects other than the above singular pronouns, the verb form has a vowel prefix. Before this prefix, the plural subject pronouns listed above function as nouns and undergo no alternation. With singular subject pronouns, however, the verb form has no prefix, but the pronouns have low tone replacing their inherent high tone. This is interpreted as a morpheme with the meaning 'unreal'.
E.g.:

(6) únú á'byágh
    'you didn't come'

ő byá'gh
    'he didn't come'

In affirmative verbal constructions, the same replace is used with both singular and plural subject pronouns. Such combinations are usually translated as, and have generally been described as, questions. After a noun subject, the third person form /ő/ or /ő/ is required. E.g.
(7) ṣ gārà ǹhyá  'did he go to market?'
     ǹnụ ǹmḕlā 'yá  'have you (pl.) done it?'
     ǹnà ọ́ gbọ̀ gbàrà  'did your father come?'

The meaning 'unreal' is here more specifically 'hypothetical'. The identification of the replacive here with that in negatives is possible because there are no negative questions in Igbo, but there are common circumlocutions such as the equivalent of 'I think he didn't go', which expects a response. By analogy, the above are interpreted as having the more basic meaning 'I suppose he went to market' etc. As in English, such hypothetical statements expect a response. (In English, speakers of Igbo sometimes say, e.g., 'I think you are going to go to Aba tomorrow', where a native speaker of English would invariably use a question.)

e. A few monosyllabic morphemes are interpreted as being inherently toneless. These include four suffixes which repeat the tone of the preceding syllable, high or low: the negative imperative suffix /-na/, the negative suffix /-gha/, the applicative verbal extension which consists of /-r/ plus a repetition of the preceding vowel, and the additive verbal extension /-kwa/. These all follow the pattern illustrated in the following:

(8) ọ́mḕlā 'yá  'don't do it'
     ạ̀zàlà 'yà  'don't sweep it'

A few other suffixes found in verb forms could also be considered toneless, but they appear only after high or only after low tone, so that their high or low tone can equally well be considered an inherent part of the suffixes themselves.

The remaining toneless morpheme is a sort of preposition, the underlying form of which is /nà/. Before a consonant (which is extremely rare) or a syllabic nasal, this morpheme takes the tone of the following syllable. Before a vowel, its vowel is elided, as indicated by an apostrophe in the transcription used here. E.g.:
Significantly, the presence of this morpheme, even when it consists of a consonant only, inhibits in what follows the operation of any morphophonemic alternation conditioned by what precedes.

f. One morphophonemic alternation must be included here, prior to the three alternations described in the following section, which have a different type of conditioning. Before any modifier except a monosyllabic form with the inherent tone downstep-high, in nouns which independently have the tones high-downstep-high, the downstep is deleted. The exception, though included in the illustrations below, is covered by the first alternation stated in the following section; in many dialects, as shown by the parenthesized alternant below, this exception does not apply. That the crucial environment here is a modifier is shown by the fact that this alternation does not take place before a verb. E.g., from /é'gó/ 'money, shilling':

(10) á cór`ó hí é'gó 'I want money'
    é'gó dí á'm'mó 'money is fine'
    égó únú 'your (pl.) money'
    égó 'átó 'three shillings'
    é'gó yá (ágó 'yá) 'his money'

2.

It seems most convenient next to describe three morphophonemic alternations which are largely conditioned by the preceding tonal environment. The derivations of the conditioning environments are assumed here, but will be explicitly stated in the following section, after which a number of apparent or real exceptions will be accounted for. The alternations described in this section will be referred to as A1, A2, and A3.

a. A1: After one or more high tones preceded by a downstep, in forms with an initial vowel or nasal whose first two tones are low-high,
initial low tone has the alternant high. In this environment, therefore, forms whose first two tones are independently low-high have the same tones as forms whose first two tones are independently high-high. Both are illustrated in the following:

(11) ̀Abá 'Aba (town)': ọ ̀ gáʼgh́̀ Abá
     'He didn't go to Aba'

̀ánánú 'oil': ọ có̀rò̀ ̀̀̀ f'zútá́́̀ ̀ánánú
     'he wants to buy oil'

ànú 'meat': ọ có̀rò̀ ̀̀̀ f'zútá́́ ̀ànú
     'he wants to buy meat'

A form of this alternation applies in monosyllabic forms with the inherent tone downstep-high; the alternation takes the form of deleting the downstep (compare the end of the preceding section). E.g.:

(12) ̀zútá́ ̀jí 'buy yams': ọ ̀zú́ tágh́̀ ̀jí
     'he didn't buy yams'

mèè 'yá 'do it': ọ có̀rò̀ ̀̀̀ f'méè yá
     'he wants to do it'

ànú 'gí 'your meat': ó'gó ̀gí
     'your money'

b. A2: After high tone when no downstep precedes, also in forms whose first two tones are independently low-high, initial low tone has the alternant downstep-high. A modification of this alternation appears only in forms with more than two syllables and an initial nasal; in such forms, initial low tone has the alternant high and downstep precedes the second syllable — that is, an initial nasal delays the downstep for one syllable. The fourth example in the following illustrates this modification:

(13) ̀âkwá 'egg' wètá 'âkwá
    'bring eggs'

ògbá 'wrestling' hà nà ̀ògbá ̀ògbá
    'they're wrestling'

òfódu 'some' wètá ̀òfódu
    'bring some'
In the last of these, the downstep of /'yá/ cannot be deleted by the Al rule, since the downstep of the preceding word is derived by A2 after Al has ceased to apply.

c. A3: With the syntactic restrictions stated below, also after high tone when no downstep precedes, in nouns with two syllables only and the tones high-high, the second high tone has the alternant downstep-high. This alternation applies to a noun used by itself (i.e., without a modifier after it) immediately after a verb, and to the second noun in a noun-noun phrase. It does not apply, although A2 does, in the second of two nouns after a verb if the nouns do not belong to the same phrase; the conditioning for A2 is phonologic, while the conditioning for A3 is in part syntactic. Examples of this alternation and its restriction to two-syllable nouns are:

(14) ánú 'meat' : wàtá ánú 'bring meat'

dwú 'goat' ánú éwú 'goat meat'

ósísf 'plant' ñkpúrú ósísf 'fruit, nut, seed'

This alternation applies only in nouns; in the following, /jćá/ 'light-colored' is an adjective, which indicates the category or class to which a preceding noun belongs [Welmers and Welmers 1969]:

(15) ónyé jćá

'a Caucasian'
Nor does A3 apply if a noun is followed by a modifier, as /éwú/ in the first two of the following; by contrast, in the third, /éwú/ is the second noun in a noun-noun phrase, and the demonstrative modifies the entire phrase, not /éwú/ alone:

(16) kpútá éwú átò
    lsí éwú áhù
    lsí é'wú áhù

'bring three goats'
'the head of that goat'
'that goat head'

Finally, A3 does not apply in the second of two nouns, not in the same phrase, after a verb. As shown in the third and the last of the following, however, A2 does apply in this environment:

(17) ácf

'yesterday, tomorrow'

: kpútá éwú ácf

'bring a goat tomorrow'

(cf.: gàá é'cf 'go tomorrow')

ányú 'meat'

: ó sìrì ànyí ányú

'she cooked meat for us'

àkwá 'eggs'

: ó sìrì ànyí 'àkwá

'she cooked eggs for us'

fró 'hatred'

há hỳrì ànyí fró

'they hate us'

(lit. 'they see us hatred')

áhù 'body'

há mèrìrì ànyí 'áhù

'they hurt us'

(lit. 'they spoiled us body')

d. An instance was cited earlier in which A1 cannot apply if the phonologic environment which otherwise conditions it is derived by the application of A2. In the environment just discussed, however -- in the second of two nouns, not in the same phrase, after a verb -- A1 applies after itself, after A2, or after A3. The rationale of this appears to be that the verb and the first noun are treated as a unit; any downstep followed by high tones in the tonal unit, whether it is in the verb before the first noun, or in the first noun as a result of A2 or A3, conditions A1 in the second noun. This is confirmed by the
first of the following examples, in which A1 also applies after a high tone which is not the result of any alternation; the conditioning factor is the downstep in the preceding verb:

(18a) əwú 'goat', əhü 'body', no alternation and A1:
     hå ə'méríg⁵ əwú əhü 'they didn't hurt a goat'

(18b) əny[ (l pl), əhü 'body', Al and A1:
     hå ə'méríg⁵ əny[ əhü 'they didn't hurt us'

(18c) əny[ (l pl), əhü 'body', A2 and A1:
     hå nə əméríg⁵ əny[ əhü 'they're hurting us'

(18d) əwú 'goat', əhü 'body', A3 and A1:
     hå nə əméríg⁵ ə'wú əhü 'they're hurting a goat'

e. In other environments than the above, A2 applies after itself and after A3. This recursive application of A2 is illustrated by the following, in which the alternation with the second word must precede the alternation with the third:

(19a) ətʃ 'three', əny[ (l pl), A2 and A2:
     əwú 'ətʃ' əny[ 'our three goats'

(19b) əwú 'goat', əny[ (l pl), A3 and A2:
     əny[ ə'wú 'əny[ 'our goat meat'

The following example shows the same surface realization of tonal alternations, but is derived differently; the alternation with the third word precedes, and is then unaffected by, the alternation with the second:

(20) ɪkó 'cup', əny[ (l pl):
     wàtá 'ɪkó 'əny[ 'bring our cups'

In the following, A2 appears four times; the order of the four applications is 3-4-2-1:

(21) əny[ 'əwàtá ə 'ɪkó 'ətʃ' əny[ 'we have brought our three cups'

A contrast between the sequence of A3-Al and A3-A2 is shown in the following. A3 appears in /nàmányà ə'kwú/ 'nut palm wine'; /ńbú/ is a
noun meaning 'the first time', here (n)ever':

(22a) ăngny / 'nhụbèghị ịmànyà ọ'kwụ ọhụ
      'we've never drunk nut palm wine'
(22b) ăngny / 'nhụbèghị ịmànyà ọ'kwụ 'anyị
      'we haven't drunk our nut palm wine'

f. For some speakers, peculiarly, in a monosyllabic modifier after a noun (but not in a verbal object), A1 reappears after A2; further, A3 applies in a noun before a monosyllabic modifier, and then A1 reappears. (As one might guess from this and other statements, these pronoun forms are perhaps the prime nuisance in Igbo when working with a number of speakers.) E.g.:

(23a) ịkọ 'yà 'his cup' wętá 'ịkọ yà 'bring his cup'
      (cf.: ăngny / 'nwọtọla 'yà 'we have brought it')
(23b) ạnụ 'yà 'his meat' : wętá ạ'nụ yà 'bring his meat'

3.

The conditioning environments for the alternations stated in the preceding section may appear in nouns, numerals, verbs, and very occasionally other words. For all forms other than verbs, these are lexical tones or tones derived by the alternations themselves. For verbs, it is necessary, before applying the above alternations, to derive the tones of bases and constructions. Such derivations, in so far as they present no problems in the application of the alternations stated, are outlined in this section.

a. It is first necessary to make statements deriving the tones of verb bases. Verb stems are monosyllabic, and may have high or low tone; a single verb stem may constitute a verb base. In a base of more than one syllable, the first syllable must be a verb stem; one or occasionally

1This supplements Welmers [1970] in which the derivation of tones is not discussed.
two stems may follow, and morphemes of a different class, base form-
atives, may also be included. The inherent tones of base formatives
are identified by comparing their tonal behavior with that of stems
which may be used independently. Bases of two and three syllables
are common, and some longer bases are recorded. The tones of a verb
base are determined by the independent (lexical) tones of the first
two syllables. If the tones of the first two syllables are both in-
dependently high, the base has high tone throughout. If their tones
are independently low and high, in that order, the first syllable of
the base has low tone, and all following syllables have high. If
their tones are independently high and low, or low and low, the base
has high tone with the first syllable, low with the second, and high
with all syllables following. Examples of these derivations are:

(24a) mè 'do, make', cf 'be stopped up' : mècì 'close'
(24b) mècì (from above), sì (indicating action done to completion
or to a stopping place): mècìsì 'tie up, fasten up
completely'
(24c) kwà 'push', cf 'be stopped up' : kwàcì 'push shut'
(24d) gà 'go', fé 'cross, pass over': gáfè 'go across'
(24e) wà 'take, pick up', pù 'exit' : wèpù 'remove'
(24f) wèpù (from above), tà (indicating action toward or for the
speaker or subject) : wèpùtà 'bring out'

b. Statements may now be made deriving certain verbal constructions.
There is no construction in which the verb base is used by itself; some
other morpheme is always present, though in some cases with a zero allo-
morph. The following numbered statements also establish a number of
tonally realized morphemes in verbal constructions.

(i) A morpheme consisting of low replacing stem tone occurs with
a limited number of verb stems, marking a "stative" construction. Two
stems which may be used for illustrative purposes are /dì/ 'be described
as; be located at (of inanimates, sometimes non-human animates)' and
/nò/ 'sit, be located at (of humans, usually non-human animates)'. E.g.:
(25a) ọ dì n'òbá à  'it is here'
(25b) ọ nọ n'òbá à  'he/she is here'

(2) A "factative" construction includes a replacive which can be identified with that of the stative. For all bases except those which begin with high-low (see above), low replaces stem tone throughout the base; for bases with initial high-low, the replacive has the alternant downstep-high with the first syllable and low with all following syllables; the downstep is, of course, overt only after a high tone. In addition to the tonal replacive, the factative has a suffix consisting of /r/ plus a repetition of the preceding vowel, also with low tone. E.g., from some of the bases cited above:

(26a) ọ gàrà ñhyà  'he went to market'
(26b) ọ wàrà ñafsì  'he took a stick'
(26c) ọ mècìrì ñzò  'he shut the door'
(26d) ọ kwàcìrì ñzò  'he pushed the door shut'
(26e) ọ 'wàpìtarà nìmà  'he brought out a knife'

(3) An infinitive is formed by a prefix, with a morphotonemic alternation in one type of base. The prefix includes a downstep, which is of course deleted before low tone; it is /'i'-/ or /'i'-. After a low tone in the base, all following tones have the alternant low. Examples of infinitive derivation are:

(27a) ọ fi : Ọ'rif
(27b) ọ zà : Ọ[zà]
(27c) ọ mècì : Ọ'mècì
(27d) ọ kwàcì : Ọ[kwàcì]
(27e) ọ 'wàpìtarà : Ọ'wàpìtarà

(4) A negative imperative has a prefix /á'-/ or /â'-/, the same morphotonemic alternation in the base, and a toneless suffix /-à/. For the bases used above, negative imperatives are as follows; Al applies in the object in the first and third:
(28a) ọ'rlá yá  
(28b) ázálá yá  
(28c) ọ'mécílá yá  
(28d) ákwácílá yá  
(28e) ọ'wépútalá yá

'don't eat it'
'don't sweep it'
'don't close it'
'don't push it shut'
'don't bring it out'

(5) Next to be considered is a relative construction in which
the antecedent noun is the subject of the relative (as in 'the man
who came', not 'the man I saw'). Many speakers of Igbo form affirm-
ative relatives only from the stative and factative constructions,
and these are the only types considered here. Two tonal replacves
must be recognized in such relatives. First, downstep-high replaces
a final low tone in the antecedent. Second, in statives and in those
factatives which have only low tones, there is an initial downstep,
and high tone replaces low throughout the form; in factatives which
begin with downstep-high-low (all of which have at least three sylla-
bles), there is no alternation in the first two syllables, but high
replaces low in all following syllables. (Such high tones appear
also in the base, but here they are the product of two successive
replacves: low replaces high in the base to form the factative, and
then high replaces low in the factative to form the relative.) Exam-
ple of relative derivation are:

(29a) ọwàták[r] byárâ.  
(29b) ọwàh[ì] mècérì úzò.  
(29c) ụnù wépùtârâ yâ.  

'child came.'  
'A woman shut the door.'  
'You (pl.) brought it out.'

Relatives are strikingly similar to, and in all probability his-
torically related to, an associative construction which is discussed
later. Because of the ways in which tonal alternations are conditioned,
however, it is necessary to separate them.

(6) In a number of constructions, there is a suffix which, after
most monosyllabic bases, longer bases ending with /i/ or /u/, and a few other bases which must be individually listed, is a vowel with high tone; the identity of the vowel need not concern us here. After some monosyllabic bases, there is an allomorph consisting of /r/ plus a repetition of the preceding vowel, also with high tone. After some monosyllabic bases, and after most longer bases ending with vowels other than /i/ or /u/, there is a zero allomorph of this suffix. Before this suffix, including its zero allomorph, bases have their inherent tones as described above in all constructions but one. E.g.:

(30a) ò byàrà rîé 'yá 'he came and ate it'  
(30b) ò byàrà zàá 'yá 'she came and swept it'  
(30c) ò mècìé 'yá, ò d] má 'if he closes it, fine'  
(30d) kà ò kwàcìé 'yá 'he should push it shut'  
(30e) kà ànyì wèpûtá 'yá 'let's bring it out'

(7) The imperative uses this suffix, but also includes a morpheme of tonal replacement. Except in bases which begin with high-low, low replaces stem tone with the first (or only) syllable of the base. For bases beginning with high-low, it is entirely reasonable to suppose that the replacive inherently has the alternant downstep before the base; this is not recoverable, however, since nothing can precede an imperative in the same clause. E.g.:

(31a) rî : rîé 'yá 'eat it'  
(31b) zà : zàá 'yá 'sweep it'  
(31c) mècì : mècìé 'yá 'close it'  
(31d) kwàcì : kwàcìé 'yá 'push it shut'  
(31e) wèpûtá : wèpûtá 'yá 'bring it out'

A special morphophonemic alternation involving an imperative from a base with two syllables and the tones high-low will be noted in the following section.

What the foregoing statements have done is to establish particular instances, other than lexical, of the conditioning environments for the alternations stated in the preceding section. Low tone in some verbal
constructions has been shown to be a morpheme of tonal replacement (1, 2, 7 above); this is irrelevant to the morphotonemic alternations, but, in (1) and (2), prerequisite to the derivation of relatives. With the appropriate types of bases, downstep followed by all high tones in infinitives, negative imperatives, and relatives conditions A1 (3, 4, 5 above). The final high tone of a suffix in a number of verbal constructions conditions A2 and A3.

4. The statements concerning morphotonemic alternations in 2. above were intentionally somewhat oversimplified in the interests of clarity. Special exceptions to them remain to be stated, and a few statements of more restricted alternations must be added.

a. (1) Apart from the negative imperative described above, there is only one negative construction in Igbo. Downstep is a characteristic of this negative construction, but with a unique morphotonemic alternation. After subjects other than singular pronouns, there is a prefix /ŋ-/- or /ŋ-/- -- with automatic deletion of downstep before low, of course. After low tone in the base, all following tones have the alternant low. There is also a suffix, /-ghį/, which is toneless. Examples of this negative construction are:

(32a) ̀anyị ̀f'rf'ghį ̀hrf 'we didn't eat (food)'
(32b)  hà ̀f'f'ghį ̀jò 'they didn't sweep the house'
(32c) ̀okọyé ̀f'm'c'ghį ̀jɔ 'Okoye didn't shut the door'
(32d)  hà ̀kw'c'ghį ̀jɔ 'they didn't push the door shut'
(32e) ̀nụ̀ ̀f'w'p'f'ghį ̀jά 'you (pl.) didn't bring it out'

After a singular pronoun subject, which has low tone in the negative, the prefix has an allomorph with no vowel, but with its high tone and downstep replacing the first tone of the verb base; if that tone was low, all following syllables in the form have low tone -- in the second and fourth of the following examples, the second syllable of the verb form had already acquired its low tone by the rule above, before the preceding low was replaced by high according to this rule. Counterparts
of the above with singular subject pronouns are:

(33a) ḍ rī'ghī ēṛī 'he didn't eat'
(33b) ḍ zāghī ụlọ 'she didn't sweep the house'
(33c) ḍ mē'cīghī ě ụzọ 'I didn't shut the door'
(33d) ḍ kwācīghī ě ụzọ 'I didn't push the door shut'
(33e) ḍ wēpūṭāghī ụb 'you didn't bring it out'

Downstep followed by one or more high tones in the negative conditions Al, as expected, except in one type of form. Before stating the exception, it is necessary to describe a "verbal noun". A verbal noun, which in most respects functions like other nouns, has a prefix which is segmentally /a₁/ or /e₁/, with low tone before high in the first syllable of the base, and high tone before low. The verbal noun is used after the stative of a verb /nā/ (which is not independently used, but to which a meaning may be assigned something like 'be at, be with') to form an "incompletive", and after the stative of /gā/ 'go' to form a "future". E.g.:

(34a) ḍ nā ḍ rī n'ṛf 'he is eating'
(34b) ḍ gē āzā ụlọ 'she's going to sweep the house'
(34c) ḍ gē ě mēcī ụzọ 'I'm going to shut the door'
(34d) ḍ gē ě kwācī ụb 'I'm going to push it shut'
(34e) ḍ nā ě wēpūṭā ụb 'I'm bringing it out'

In the negative of the incompletive and future, the formation described above applies to /nā/ and /gā/. This yields forms which have a downstep followed by one or two high tones. According to Al, it would have the alternant high. An exception must be added to the statement for Al: it does not apply in a verbal noun after a negative. E.g.:

(35a) ḍ hā'gāghī ēṛī n'ṛf 'they're not going to eat'
(35b) ḍ nā'ghī ěwēpūṭā ụb 'he's not bringing it out'

b. (2) A similar exception must be incorporated into the statement of A2. A verbal noun may occur after a "consecutive" construction with /nā/, in which /nā/ has the zero allomorph of the previously
described suffix with high tone. According to A2, it would be expected that low tone in the verbal noun prefix would have the alternant downstep-high; in this environment, however, the alternation does not apply. E.g., in the next-to-last word of the following:

(36) ha na árj h'rf, na âŋû h'mânyá
   'they're eating (food) and drinking (booze)'

In spite of the above, it cannot be said that the verbal noun prefix before a high tone is an invariable low tone; Al applies regularly after a relative:

(37) ónyá 'ná árf h'rf
   'the person who is eating'

c. (3) In a "completive" construction, after a subject other than a singular pronoun, there is also a prefix /à-/ or /à-/. After high tone, the tone of this prefix has the alternant downstep-high according to A2. After a singular pronoun subject, the vowel of the prefix does not appear; the allomorph of the prefix is downstep alone. With appropriate verbal bases, these statements yield forms which have a downstep followed by all high tones, which is otherwise the conditioning environment for Al. However, this allomorphic downstep is itself the product of A2, with a statement added here deleting the vowel after singular pronouns, so that Al can no longer apply. After such completive forms, A2 and A3 apply. E.g., with objects /ákwa/ 'egg' and /árf/ 'food':

(38a) únù árélá h'rf
     'you (pl.) have eaten'
(38b) ânyə 'árélá 'ákwa
     'we have eaten eggs'
(38c) ð 'ráélá h'rf
     'he has eaten'

d. (4) A morpheme with the meaning "associative" is recognized as present in phrases such as /ů'ľ' / 'âný[,/ 'our house', which is /ůľ/ 'house' associated with /âny[,/ 'us'. The tones of this and certain other types of phrases are not accounted for by the morphophonemic alternations stated so far. Nor can they be directly accounted for by other alternations, because the same independent tones do not have alternants in a sequence of noun plus numeral, as /<ul>átʃi/ 'three houses'.

It might, of course, be suggested that morphologic conditioning is present; the alternation takes place if the second word in the phrase is a noun, but not if it is a numeral. However, a numeral may also participate in the associative construction. There is a minimal and morphemic contrast between /gɨlə ątɔ/ 'three houses' and /gɬɨlə ątɔ/ 'the third house'. The alternations in question can be accounted for if the associative morpheme is interpreted as having the underlying form of a high tone between two nouns, or between a noun and another word used nominally. (Historically, the high tone undoubtedly originally accompanied a vowel.)

One morphophonemic alternation conditioned by this underlying high tone is here derived after A1 but before A2 and A3; an alternative possibility is to derive it after A3, but the required statements would be more complicated and less reasonable. If the associative morpheme is followed by a low tone (before the application of A2 if a high tone follows that), final low tone in the preceding noun has the alternate downstep-high; i.e., it is assimilated to the level of the associative high tone. This, with deletion of downstep after low, accounts for the tone of the final syllable of the first word in each of the following; the last two of these include the later application of A2, and all of them show the still later deletion of the associative high tone:

(39a) āhà 'name' : ā'hà ɔbɔdɔ āhù 'the name of that town'
(39b) ɔbɔdɔ 'town', ə 'this' : ɔbɔdɔ ə 'this town'
(39c) ɡɨlə 'house', əny[ (l pl) : ɡɬɨlə əny[ 'our house'
(39d) ɬtę 'pot', əny[ (l pl) : ɬtę əny[ 'our pot'

The underlying high tone of the associative morpheme is deleted only after the application of A3. It is only this that can account for A3 applying after low tone in the surface manifestation in phrases like the following:

(40) ɡɨlə 'house, building', əhyá 'market, merchandize':
    ɡɨlə ə'hyá 'store, shop'

It now becomes apparent that, in many of the examples previously
cited for A2 and A3, though by no means all of them, the alternation is actually conditioned, in the deeper structure, by the high tone of the associative morpheme rather than by the final high tone of the preceding noun. These include cases like the following:

(4la) ẹgó 'money', ẹnyí (1 pl): ẹgó 'ányí 'our money'
(4lb) ọkó 'cup', ọmánýi 'oil': ọkó ọmánýi 'a cup of oil'
(4lc) ọnyí 'meat', ãwú 'goat': ọnyí ọwú 'goat meat'

Implicit in the foregoing is an interesting ambiguity. As noted above, in /júkó àtó/ 'three houses' the associative morpheme is not present, but in /júkó àtó/ 'the third house' it is present and conditions two morphotonemic alternations. In a phrase such as /èwú àtó/, however, there are two possibilities: the application of A2 in the second word could be conditioned directly by the final high tone of the preceding noun, in which case the phrase would mean 'three goats'; or it could be conditioned by the underlying and later deleted high tone of the associative morpheme, in which case the phrase would mean 'the third goat'. This ambiguity is normally avoided by using, for the ordinal, the noun /jókè/ 'thing, the one' in association with the numeral, yielding /jókè àtó/ 'the third'. The noun is then used in association with this phrase, yielding /èwú jókè àtó/. In the relatively careful speech characteristic of linguistic analysis and language teaching, /èwú jókè àtó/ is often heard, without the normal manifestation of the associative morpheme after the first word. This is presumably appositional: 'a goat, the third one'. The technically ambiguous /èwú àtó/ is assumed to refer to 'three goats'.

By analogy with the use of /jókè/ to avoid ambiguity in ordinal phrases after a high tone, it is commonly used also after a noun with inherent final low tone, where there would be no ambiguity in any case. Thus 'the third house' is often, if not usually, expressed as /júkó jókè 'útó/. On the other hand, in some combinations where the ordinal is the only reasonable semantic possibility, /jókè/ is not used; e.g., /n'èlèkèrè àtó/ 'at the third bell, at three o'clock'. All numerals ('two' through 'ten' and derived phrases) are included in these state-
ments; they all begin with low-high. (The words for 'one', 'twenty', and 'four hundred' are grammatically nouns, not numerals.)

The foregoing discussion of the associative construction is, of course, in the context of a treatment of tonology. It may not be out of place, however, to add that it is presented with a full consciousness of the striking grammatical parallelism with associatives in Bantu and other languages [Welmers 1963]. There are also some differences in grammatical detail, as will be seen in connection with possessive pronouns.

e. (6) After nouns other than verbal nouns, the combination of a noun with a monosyllabic modifier (a pronoun) does not include the associative morpheme. This is attested by the fact that final low tone in such a noun does not have the alternant downstep-high as required before the associative. E.g.:

(42a) ụlọ yá
     'his house'
(42b) ịtè gị
     'your pot'

For some speakers, the same is true regularly after verbal nouns; thus, from a verb stem /bè/ 'cut':

(43) ọ nà ọbè yá
     'he's cutting it'

For many other speakers, however, the combination of verbal noun with pronoun must be interpreted as including the associative morpheme; thus, probably more commonly:

(44) ọ nà ọ'bè 'yá
     'he's cutting it'

A verbal noun with a following noun ("object"), however, always uses the associative construction:

(45a) ọ nà ọ'bè ịdọ
     'he's cutting a rope'
(45b) ọ nà ị'zá 'ézi
     'she's sweeping the compound'
The grammar of these may be reflected by 'he is-at rope-cutting' and 'she is-at compound-sweeping'.

f. (7) In the sequence of an imperative from a two-syllable base with the tones high-low and a noun or pronoun object with initial low (or downstep), a complex of alternations identical with those conditioned by the associative morpheme (but not identifiable with it) is found. The conditioning factor in this case can be identified in the underlying structure as the high tone of the verbal suffix; in the surface structure, the suffix has a zero allomorph with most verbs of this type. E.g.:

(46a) há'pụ 'ányị 'leave us alone'
(46b) há'pụ 'yá 'leave him alone'
(cf.: hápụ éwụ à 'leave this goat alone')

g. (8) Two special alternations apply in the subject of a verb if something precedes it in the same clause. The first of these is after high tone in this additional environment: initial low followed by high in the subject has the alternant high. The second is identical with the alternation before the associative morpheme, though the presence of that morpheme is out of the question: before low tone, final low in the subject has the alternant downstep-high. Both of these alternations are attested in relative clauses (of the type 'the man I saw', not 'the man who came', in which the antecedent is the subject). Only the second is attested anywhere else. The reason for this is that anything other than the antecedent of a relative, before the subject of a verb in the same clause, must be followed by the morpheme /kà/, which does not have the conditioning high tone. In the relative clauses among the following examples, the antecedents are nouns meaning, respectively, 'thing, matter' and 'place'; the alternation illustrated in each is shown by a numeral:

(47) (1) : -anyị : ihé ányị mérè 'what we did'
(2) : únụ : ihé ì'nụ mérè 'what you (pl.) did'
(1, 2): ókóyè : ihé ókó'yé mérè 'what Okoye did'
It has been assumed that the third person plural pronoun form, which among other things may be used as a verbal subject, has an initial downstep: /'hã/. For the singular subject pronouns, there is no evidence that there is or is not inherently an initial downstep. If there is, they are also included in a minor extension of the first of these alternations: after high, initial downstep in the subject is deleted.

E.g.:

(48a) óbá há ngó 'where they are'
(48b) íhó ó ná èmè 'what he is doing'

h. (9) Two expressions in adverbial usage are exempted from A1 and A2; their initial low tone does not undergo alternation. These are /ò孜/ 'again, any more', and /ùgbú à/ 'now'. The latter of these is apparently a noun meaning 'time' and the demonstrative 'this', but the noun is not attested in any other combination. Instances of these in the conditioning environments for A1 and A2 are:

(49a) ọ córò ['byá ò孜 'he wants to come again'
(49b) kà ọ byá ò孜 'he should come again'
(49c) mà 'ýà ùgbú à 'do it right now'

The first of these also appears without alternation in what otherwise seems to be an associative construction after the words /'izù/ 'week', /òòwà/ 'month', and /ǎtọ/ 'year', with the meaning 'next'. The three expressions are:

(50a) 'izù ò孜
(50b) òòwà ò孜
(50c) ìtọ ò孜

It cannot be said, however, that initial low tone is simply invariable in these expressions. A completely regular associative construction using /ò孜/ is also found, similar to the ordinal expressions previously noted. E.g.
Nor does it seem feasible to assign the instances of non-alternation in these expressions to adverbial use in general. There are some constructions in which a noun /mby/ 'the beginning, the first time' appears in comparable adverbial usage, but with regular alternations; note the contrast in the following:

(52a) ọ gàrà ọba ọzọ
       'he went to Aba again'
(52b) ọ gàrà ọba ọmbụ
       'he went to Aba first'

A rigidly formal presentation of all that has been said about Igbo tone would inevitably be more difficult to follow, or more lengthy, but it is of course possible. It would follow this order, by way of rough outline:

(1) Identify lexical tones, including the high tone of the associative morpheme.
(2) Derive the tones of verb bases.
(3) Derive the tones of verbal constructions, including the tones of subject pronouns.
(4) Make statements concerning monosyllabic nouns, including the pronominal types.
(5) State the alternation illustrated by /ọgọ .../ from /ọ'gọ/.
(6) State A₁, A₂, A₃ with the exceptions noted.
(7) State the alternations in (4.f.) and (4.g.) above.

Thus far Igbo tonology. *Requiescat in pace.*
REFERENCES

