# THE INTONATION OF AMERICAN ENGLISH

*by*

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# PREFACE

This volume is largely an expansion and revision of materials which were published in the author's Pronunciation, Vol. I of An Intensive Course in English for Latin-American Students by the English Language Institute of the University of Michigan. The latter material, which appeared in the summer of 1942, included the results of research which had been conducted earlier that year. The presentation of the data, however, was in the form of lesson plans for Latin-American students, designed to aid them in obtaining a satisfactory pronunciation of English. In 1943 the Institute revised their Intensive Course, incorporating in the new materials a limited selection of the intonation data which had appeared in the volume on pronunciation and which would serve the student most practically and simply. This present study is now offered to a different class of readers, that is, to those who wish to have a statement of the structure of the English intonation system as such, in relation to the structural systems of stress, pause and rhythm, rather than a sampling of the data for use in the classroom. Therefore, it utilizes the more technical intonation material of earlier work, expanding and revising it.

Preliminary data from other lines of research which have been begun cannot be included here, but we hope that the inquiry may eventually be pushed to completion, and the data results made available to the public. Initial steps were undertaken on the analysis of the intonation of Spanish and Portuguese, sufficient to indicate that a similar approach would uncover a similar structure although one considerably different in details. For English, however, the next important step in investigation seems to be the correlation of the structural system with instrumental measurements which can give the physical description of the system and the permitted range of frequency, intensity, and durational variation within it. On a practical level, however, the present data points the way toward the utilization of a symbolic representation of intonation in the training of speakers for appearance in public or over the radio.

The investigation was made possible in the Spring of 1942, and the academic year of 1942-3, by a grant from the Faculty Research Funds of the University of Michigan, and by my position as Research Associate of the English Language Institute. In the fall of 1944 the preparation of the first part of the manuscript was continued with funds from the Summer Institute of Linguistics, of Glendale, California. In the Spring of 1945 the manuscript was completed as part of the work undertaken as Lloyd Post-doctoral Fellow of the University of Michigan.

I wish to thank the many persons who have helped in the preparation of this book. In the notes I have tried to give acknowledgment for specific contributions, but, in addition, the Staff of the English Language Institute have been most helpful in testing the materials in various ways, both as against their own dialects for the form and meaning of the intonation contours, and in their utilization of the material in the classroom. Dr. Aileen Traver directed my attention to certain of the problems encountered in the practical handling of intonation data, which were instrumental in initiating a number of profitable lines of research. Most valuable of all, however, has been the stimulation received from Professor Charles C. Fries, Director of the Institute, in informal discussions which I had with him concerning all of the major problems which developed as the research progressed.

In order that readers of the manuscript may be able to have a preliminary understanding of the technical terms defined in the body of the work, but which must be used in the review of earlier publications in Section Two, there will be given a few sample sentences, immediately following this Preface, with the parts of the sentences labelled.

INTRODUCTORY ILLUSTRATION OF THE CHIEF TECHNICAL TERMS FOR

INTONATION WHICH ARE USED IN THE MONOGRAPH

So 'far as the 'question of my i"dentity is concerned, you 'have my 'name and 'address,
4- °3- -4- °3- -4 4- °2--4- -4-3 / 3- °2- -4- °3- -4- °3- -4-3/

as well as the an'nouncement of my profession, on the 'card.
4- °3- -4 4- °3--4-3/ 3- °2-4//

It is 'quite 'true.
3- °3-2 °3-4//

Will 'he do it?
4- °3- -1/

PITCHES

Pitch levels: lowest relative pitch, level 4, on So; higher pitch, level 2, on identity; highest relative level, on the word it in the last sentence.

Continuous-line symbolism: solid or dotted lines may optionally replace numerals: pitch two at the top of the letters; pitch three at the bottom of the letters; pitch one considerably above the letters; pitch four considerably below the letters.

CONTOURS

Primary contour: card (a short primary contour); "dentity is concerned (a long primary contour, excluding the first syllable of identity).

Beginning point of a primary contour: Each syllable marked with the sign [°] (or, in Section 6.1, with a solid line).

End point of a primary contour: tion of question, or the last part of the syllable card (or, in Section 6.1, with a broken dash before a pause or intonation break).

Change point in a primary contour: first part of the syllable dress, in address (or, in Section 6.1, with a broken dash between a solid line, and another broken dash after it).

Falling contour (label applied to primary contours, only) card; or nouncement in announcement.

Falling-rising contour (label applied to primary contours, only): address (but So far as does not constitute a rising-falling contour because it does not begin with a degree sign).

Rising contour (label applied to primary contours, only): quite; and he do it?

Total contour: of my identity is concerned; applied to any group connected by hyphens.

Precontour: of my; the part of the total contour which precedes the [°].

STRESS

Normal (i.e. strong) stress: on ques in question; and on card; indicated by ['].

Emphatic stress: on den of identity; indicated by ["].

Partially reduced stress: on cerned of concerned; and on do; stress symbol omitted (except in Section 4.4.7, which see).

Optional stress: in the title, on the word intonation, which would be symbolized (')inton'ation (in Sections 4.4.5-7, only, which see).

Normal placement of stress: on question, name, address, card.

Special placement of stress: on he.

PAUSE

Tentative pause: after concerned, address, and the word it in the last sentence; indicated by a single bar [ / ] (and frequently occurring at the ends of sentences also).

Final pause: after card, and true; symbolized by two bars [//] (and occasionally occurring in the middle of a sentence). Note: the pause before a person begins to talk is not marked.

RHYTHM

Simple rhythm unit: on the card, and Will he do it?; symbolized by the presence of only one unsuppressed stress between pauses.

Complex rhythm unit: so far as the question of my identity is concerned; identified by the presence of two or more unsuppressed stresses between pauses.

Syllable in double function within a complex rhythm unit: as; my; and; identifiable as being linked by hyphens to the primary contour which precedes that syllable, and to the primary contour which follows it, instead of being linked only to the preceding one as an end contour point, or to the following one as part of a precontour.

Intonation break: the point between question and of my identity; also, between quite and true; and every other place where the numbers are neither joined by a hyphen (or hyphens) nor separated by a slanting bar (or bars); also, in solid-line symbolism, indicated by a break in the line.

QUALITY AND QUANTITY

Quality, and general pitch characteristics: see special symbols in Section 4.4.9.

Quantity: see Section 4.4.8, for use of [:] at various parts of the syllable.

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## 1. Procedure of Investigation

This investigation of American English intonation was begun in 1942 to solve a practical problem. The English Language Institute of the University of Michigan, in teaching English to Latin Americans, found that certain intonation patterns of Portuguese and Spanish speakers were carried over into English and made objectionable their attempts at speaking this language new to them. In order to teach English intonation effectively, an investigation of American intonation patterns was launched to discover the basis for such teaching and, if possible, to find the smallest number of patterns which could be used profitably as a basis for initial drills in the language. The pedagogic results may be seen in the 1943 revision of An Intensive Course in English for Latin American Students, by the Research Staff of the English Language Institute, Charles C. Fries, Director, Much of the theoretical material which had appeared in the 1942 materials and had to be omitted for practical reasons in the revision of 1943 is now presented here in amplified form for students of intonation or of tone languages.

The writer began the study under the assumption that phonetic characteristics of speech, in order to be semantically significant (phonemic) must differ from one another (i.e. be in contrast) in phonetically similar positions in words, phrases, and syllables. A corollary of this fact is that phonemic characteristics are not caused or conditioned by any other phonetic feature. (For a more detailed statement of phonemic principles see 2.3.) The author set as his goal the isolation and listing of as many of these contrastive characteristics of intonation as possible.

Several observations early shaped the whole course of the investigation:

(1) The first part of a sentence could be kept the same, within perceptual limits, while the last part of the sentence could be changed in pitch and resultant meaning--for example, by the use of rising instead of falling pitch at that point. This fact implied that some significant--i.e. phonemic--pitch characteristic must be present at the end of such a sentence which is not dependent upon the first part of that sentence. Further, parts of sentences could be studied independently. This proved very important inasmuch as it is difficult to retain long phrases in pitch memory, and the pitch of the first part of a phrase may be significant, but independent of the second part.

(2) The final semantically-significant contours are optionally applicable either to single syllables or groups of syllables or to single words or groups of words. A corollary to this second observation is the fact that the significant contours may optionally be begun at different places in the sentence.

(3) More than one type of contrasting rising glide was found, with different meanings. This immediately demanded a more complex orthography than 'rising,' 'falling,' 'circumflex,' and 'inverted circumflex.' These meanings could not be corollated with the grammar, nor their usage specifically with questions, statements, or the like, but rather had to be analyzed as implying speakers' attitudes more or less independent of the grammar.

(4) Some of these rising glides began (perceptually, of course) at the same pitch level; in those cases the contrast depended on the height of the end points. A similar situation prevailed with certain of the falling glides. This led to a hypothesis that the contours might possibly be analyzed and transcribed in terms of a limited number of end points. This was very surprising to me, since I had seen such a situation in tone languages but never suspected it for intonation.

(5) This hypothesis was checked by trying to find the minimum number of end points which

would accommodate all the rising (and falling) contours (glides or steps) discovered up to that time. Three levels would not accommodate all the glides, since starting from a low pitch, three separate rising glides were discovered which had different semantic values; their three respective final end points plus the one initial point demanded four points of reference. Five reference points did not seem necessary, since any fourth rising glide starting from the same low pitch always resulted in the perception of one of the other three meanings.

(6) Postulating four levels, it became apparent that still other glides might be found if all theoretically-possible permutations of glides between two such end points were existant in English. Over a period of time, all of these glides--and others with three points of reference--actually were found in normal English, when the context was appropriate. A certain residue of phenomena remained which did not fall into a series of four relative levels; these had to be cataloged as special types of contours [4.3.2].

(7) From these first observations and conclusions a considerable number of classified pitch contours could be fairly satisfactorily handled. Various related phenomena, however, were interwoven with the pitch action: rhythm, stress, quantity, pause, sequences of contours, style, voice quality, emotion, mental attitude, dialectal differences, syntax, morphology (including compounding), and so on. While some of these caused considerable difficulty and are still unanalyzed, some of the over-all internal relationships of the system began to emerge and are presented here. Meanings were very difficult to define--and are still subject to revision.

While the investigation of the intonation of American English was proceeding, the writer was also taking the first steps in the intonational analysis of Portuguese and Spanish. It would appear that their systems of intonation might be analyzed by a similar approach even though their specific contours and meanings differ.

The English material has been partially tested by submission to classes in general phonetics, with American students. A practical application of minimal intonation curves has also had considerable success in the experiments by the English Language Institute in teaching English to Latin Americans (see 5.1 for details). The general material has been used also as basic material for teaching students to observe their own speech pitch before attempting the analysis of tone languages (see 5.2).

The material in the following pages will not be presented in the order in which its basic principles unfolded during the investigation, but in a deductive form reflecting more clearly English intonational structure. For further details of experimental usage and development of the material, however, see especially Section Five.

## 2. The Relationship between Auditory and Instrumental Analyses.

The discussion of the literature dealing with intonation has here, for convenience, been roughly divided into two parts: those studies which use a perceptual, auditory, analysis, and those which utilize instruments either for investigation of the mechanisms producing sound waves, or for analysis of the sound waves themselves. There is considerable overlapping. Auditory studies will be considered first.

### 2.1. Auditory Analyses

#### 2.1.1. Early British Studies

The earliest mention of the intonation of English seems to have been made in connection with the discussion of punctuation marks, or rules for their usage. Thus, John Hart, in 1569 said that "And for the marke of the interrogatiue and admiratiue, I woulde thinke it more reasonable to use them before then after [the sentence], bicause their tunes doe differ from our other maner of pronunciation at the beginning of the sentence. Which I thought good to remember, but to use them as they are received [i.e. without spelling reform or special phonetic symbols], seeing the matter is of no great moment."[1]

Although Hart mentioned tone in connection with the question mark, nevertheless he did not do so in connection with the other symbols for punctuation. In general terms, he stated (f.44, p. 2) that the signs are "...pointing, which...sheweth us how to rest: when the sentence continueth, and when it endeth..."; also (f. 45, p. 1) the "...comma, doth but in maner diuide the small parts...[of a sentence]" and as for the colon in the sentence (f. 45, p. 1), "...these two prickes may well signify a great part thereof...." The period (f. 45, p. 1-2) is "...a pricke thus . to signifie the ende of a full and perfite sentence, as the head and feete are the extréeme endes of a body...."

In the grammars of the next few generations--and to the present--punctuation was largely defined in terms of the degree of grammatical or logical relationship between the parts of a discourse. In addition, however, the definition was supplemented at times with length of pause (the comma representing a shorter pause and the period a longer one) and brief mention of pitch (falling pitch at a period, and level or rising pitch as a comma or question mark). Charles Butler indicates all of these characteristics in his grammar of 1634,[2] as may be seen from the following brief quotations (his special phonetic symbols I have changed to normal spelling): "Ton' is the natural and ordinari tun' or tenor of the voic': which is to ris', or fall, as the Primari points shall reqir', (Chap. 4, § 3.1). "Period is a point of perfect sens, and perfect sentenc' : which, in the last woord, falleth the Ton' of the voic' below its ordinari tenour, with a long paus." (Chap. 4, § 3.1). "Comma is a point of mor' imperfect sens, in a simple axiom, or in either part of a compound: which continueth the tenour of the voic' to the last, with the shortest paus." (Chap. 4, § 3.1). "Erotesis, if it bee pur', raiseth the common Ton' or tenour of the voic' in the last woord' unless Emphasis draw it: but if it begin with a woord interrogativ'; as, [who, what, how, wher', when, why, &c;] it falleth as a Period..." (Chap. 4, § 3.2). There are further statements about parentheses, semicolon, and so on.

It is with considerable justification, therefore, that Lee S. Hultzen has pointed out that Butler worked with two tunes--a rising and a falling one[3]--quite similar to that system used by Daniel Jones.

Other grammarians of that time did not give as much attention to pitch as did Butler. George Puttenham, (1589) emphasized length of pauses, with the comma indicating the "...shortest pause..." and the colon "...twice as much time..." as the comma, with the period giving "...a resting place and perfection...from which they needed not to passe any further..."[4] Ben Jonson had a similar distinction, between a comma indicating an imperfect sentence as against the full stay of a perfect sentence which rests the spirit at the pause.[5] Simon Daine similarly spoke of the period which "...signifies conclusion."[6]

The first impressive study of English intonation as such appears to have been that of Joshua Steele, in 1775.[7] In that year, provoked by statements of Lord Monboddo[8] which claimed that English had no change of tone upon syllables, but only upon words and sentences, and that English accents could not by their nature be subjected to any rule, Steele set out to demonstrate that pitch changes actually do occur in regular form upon syllables. Asserting that music progressed by steps but speech by glides, he started from a musical type of analysis to prepare a notation for speech. His transcription included many specially invented signs to indicate pitch changes of one quarter, one half, and three quarters of a tone; one half, one quarter, and one eighth rests; slides up and down; crescendo and decrescendo; four degrees of loudness; three degrees of general heaviness of cadence. In addition, on a musical clef, he gave many degrees of pitch, statements of general style (forte, piano, adagio, allegro, largo, staccato, sustenuto). Adagio, for example, was sternly graceful.

So far as I know, no previous author had attempted to indicate so many speech characteristics in an "alphabet." His material suffered, however, from two chief defects: First, he tried to make the analysis in terms of units of music which were rigidly fixed and absolute rather than flexible and relative. Secondly, in emphasizing the importance of pitch upon specific syllables he overlooked the equally great importance of unitary intonation contours on sentences or phrases as a whole.

In the fifty year period following Steele's work, several items appear. John Walker[9] called attention to, and provided symbols for, rising and falling pitches, with circumflex (rising-falling and falling-rising) and level ones also; he illustrated these with considerable bodies of text, and attempted to make the theory pedagogically usable. To a considerable extent he tied the pitches to grammatical structure. Thomas Sheridan[10] had a chapter on pitch of the voice, but confined it largely to sweeping inaccurate generalizations of a type such as (121) "the language of ...passions...[is] fixed, self-evident, and universally intelligible," "in all minds alike." He extends this to include immediate human understanding of all animal cries, because a dog obeys its master, and so on. He attempts no analysis of specific pitches, nor any practical symbolism. J. Odell,[11] discusses rising and falling pitches, denying the possibility of level ones, but (vi) he has "done little more than comment on the text of Mr. Steele." John Thelwall[12] made only brief reference to melody, including the general pitch of the voice, but had a short discussion of styles of speaking, such as pathetic voice texture.

As early as the seventeenth and eighteenth centuries many of the chief problems of intonation had been encountered, although most of them had not been recognized as such. Is intonation important to communication, or is it something which can safely be ignored (Hart)? Are pauses to be described in terms of their relative length (Puttenham) or as a conditioning of the pitch in some way (possibly, but not certainly, Butler)? Can the intonations be divided up into two or more general pitch schemes (Butler), or is a more complicated system necessary for description (Steele)? From which of these factors streams the perfect versus imperfect sense of the finished versus unfinished sentence--or is that a function of the grammatical structure (cf. Hart, Puttenham, Butler, Jonson, Daine) or of the pauses and intonation (cf. Butler)? Is pitch unimportant and practically nonexistant in English because it is not lexical as in Greek (Monboddo) or is it nevertheless highly significant (Steele)? Does the pitch act primarily on syllables (Steele) or is it spread over words and sentences (cf. Monboddo)? Should the pitch be represented like music (Steele), or by a few marks for the general trend of the voice (Walker)? Does the

pitch of English function like mere animal cries (Sheridan), or like the dull beating of a drum (Monboddo), or like extremely intricate music (Steele), or in extremely simple tunes slightly modifiable (Butler, Walker)? Is intonation independent of grammar or caused by it or accompany it in some specific relationship (cf. Steele versus Walker)? Should the attention be placed upon a full analysis, regardless of practicality of writing (Steele), or should an attempt be made to indicate a few pitch curves, only, by a limited number of symbols for use by students (Walker), or left as punctuation (Butler)? Finally, should the analysis of English intonation be prepared for the native or for the foreigner (cf. Hart's discussion of both uses of the phonetic alphabet, f.5, p. 1-2)? Many of these problems will be encountered again in the following pages.

2.1.2. The American Elocutionists

In 1827 an American physician, James Rush,[13] published an elaborate system for indicating the pitch of the voice in speech. He considered that his analysis represented the "unity of laws of nature" and "fixed and describable relations between the states of thōt and passion, and the vocal signs, which respectively denote them." Rush divided the constituents of the human voice into vocality (i.e. quality: rough, smooth, harsh, full, thin, musical), force (i.e. strong, weak, loud, forcible, feeble, with "no fixed degree of measure"), time (i.e. long, short, quick, slow, rapid), abruptness (i.e. sudden versus gradual emission), and pitch (i.e. rise or fall, high or low, acute or grave, etc., especially in relation to music). In addition, he placed considerable emphasis upon glides ("concrete") versus steps ("discrete") of pitch. His major goal for public address seems to have been the achievement of orotund quality, but attention was also given to types of admiration, surprise, inquiry, mirthful wonder, sneering, scorn, falsetto, whispering, song, and recitative.

Rush's intonational analysis suffers from too strict a reliance on fixed musical symbolism, and failure to make a clear presentation of distinct speech melodies. Even his followers admit that his material is hard to understand, and Rush himself is annoyed that many of his contemporaries seemed to find it incomprehensible.

In England, the analysis made by Rush does not appear to have been readily accepted, even though many works, for example that of Edward Manwaring,[14] had appeared there some decades earlier, in which an attempt was made to indicate how oratory could be made more mellifluous, or discussing elocution in general, he did not attempt to link this oratory with an analysis of intonation. Later, however, Charles John Plumptre[15] adopted much of Rush's material for lectures in Britain.

In the United States of America, however, Rush received a large following, and until the end of the century, books on elocution such as those by William Russell,[16] Frank H. Fenno,[17] and George L. Raymond[18] adopted his material or, like that of James E. Murdock,[19] set out to simplify it. Murdock gives some interesting (if not necessarily accurate) descriptions of voice quality: Solemn style is said to be lower and slower than normal; animated style has higher pitch, stronger, quicker, and natural in quality; orotund is clear (with no nasal or aspirated quality), full (grave or hollow), smooth (not gutteral), ringing (like music); aspirated quality is impure, with the air not molded into speech, and is used for dread, wonder, astonishment, awe, grief, deep love. In addition, Murdock gives tables showing the quality, force, pitch, movement, stress, and intervals of shouting, revenge, sorrow, anger, awe, and so on.

By the beginning of the twentieth century, the intonation material was disappearing from the elocution textbooks, while training for orotund tones (possibly equivalent in quality to so-called "pulpit voice") was much less frequent--but reappeared occasionally in specific instruction to theological students, as in material by Albert Francis Tenney.[20] Instead of emphasis upon the quality of voice, attention began to be centered on the construction of sentences,[21] or reverted to a modified form of Aristotle's rhetoric.[22] In the present decade, books on "public speaking"[23] show but little of Rush's earlier influence.

2.1.3. Later British Studies

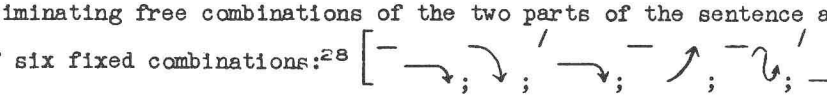
The type of general reference to rising and falling pitches first seen in Butler's material carried over to the twentieth century. Henry Sweet[24] devised a symbolism to indicate a rising tone [ ´], heard in questions such as what´; a falling [ `], in answers to questions such as in no`; a falling-rising [ ˇ], as in take care ˇ; and a rising-falling [ ^], for sarcasm as in Oh!^ In addition, he indicated the possibility of level tones, high or low; and greater intervals, for example on a long rise, for further emphasis or surprise. He gave very few illustrations of his material, and did not analyze the subtleties of minute changes of pitch and meaning.

By plotting speech curves on a musical staff,[25] Daniel Jones demonstrated that intonation is in almost constant movement. He obtained these curves by picking up the needle of a phonograph at various points during the playing of each syllable, and charting the pitches which he heard. This proved helpful in showing the continuously changing pitches, but did not provide for them a detailed method of transcription (but see footnote 24).

In 1922 Harold E. Palmer, in his English Intonation,[26] took a great step forward. Instead of dealing either with the pitch of single syllables, or with the pitch of a sentence as a whole, he discovered that the sentence could be broken into several parts of one or more syllables each, and that each part might have its own intonation contributing to the whole. These parts he called the "nucleus," "head," and "tail" of the intonation. My own analysis of intonation was largely complete before this particular work of Palmer's came to hand, but I consider a similar series of observations, made independently, to be one of the most important factors contributing to my results. Roughly, his term nucleus corresponds to the primary contour described in this present study, and head corresponds to pre-contour. By various combinations of his four nuclear and three head types, Palmer was able to handle satisfactorily many small variations in large units which, if they are not broken into parts, are very cumbersome to describe.

Palmer did not postulate a limited number of pitch levels. If British speech proves to be similar to American English in this respect, such an oversight may prove to have been responsible for Palmer's failure to develop a transcription for many more of the primary contours other than these four which he does give us (possibly some of these extra ones could be found in his intensified types).

In later material,[27] Palmer demonstrates the feasibility of using a transcription based on this analysis, by providing students with sample sentences containing the intonation symbols placed directly before the phrases they qualify.

Under the pressure of teaching English to foreigners, Palmer tries, in a more recent publication, to gain simplicity by eliminating free combinations of the two parts of the sentence and substituting for them a group of six fixed combinations:[28]  Although such simplicity is probably essential for the teaching of foreigners, it obscures the true picture of the intonation system of the language.

In this last item of Palmer's, a further teaching problem obscures the nature of the actual system: Palmer lists types of sentences which utilize the respective intonations. For example, the first intonation is for statements (when they are declarations or suggestions), commands, and questions; the second is for assertions, commands, and questions. Here, and in later groupings, there is much possibility of overlapping--as he frequently points out by notes such as, "In all the above, the...intonation may be replaced by the..." The effort to define usage in terms of grammatical form fails to give clear-cut distinctions (see also, below, 3.2).

In the same year that Palmer's larger intonation study appeared, Walter Ripman published some material[29] very different from Palmer's, but also important. He gave a connected text with intonation marks. These symbols were numbers placed above the syllables to show their pitch

level. For most of his text, three levels, only, are used. Occasionally he uses two additional higher levels. It should be added that in the text his fifth level occurred only in a descending series of stresses of the type for which special provision had to be made here, also (section 4.3.2, below).

Evidently Ripman arrived at the particular number of levels by a feeling of their adequacy, rather than by deliberate phonemic analysis, since he says that a student "is at liberty to use higher numbers in order to indicate a wider range of pitch." "As far as this [the first, but not the second] simple passage is concerned, three notes seem adequate for my rendering." Nevertheless, his notation might well give an indication that British English is subject to a phonemic analysis in terms of four levels, similar to the one at which I have arrived for American English.

Although Ripman was thus tending toward phonemic levels, he made no attempt to symbolize significant parts of intonation contours in the way that Palmer did; nevertheless, he postulated three degrees of pause, which bounded the contours.

Four years after Palmer's major work, and that of Ripman, Lilias E. Armstrong and Ida C. Ward prepared an entirely different analysis[30] which made an influential contribution to the field even though it did not incorporate any of the advances of Palmer and Ripman. Instead of breaking a sentence intonation into levels, and parts, and presenting a goodly number of intonation melodies which could enter into various combinations, they utilized a stream of dots and curves between two lines representing high and low pitch, for a general record of the height of the voice on each syllable, and limited the basic structure of their analysis to a postulation of two tunes and modifications of them.

Tune One consisted of a sequence of stressed syllables on a descending scale, with the pitch falling to low, on or after the last stressed syllable. Unstressed syllables possessed various options; initially, they might be rising, mid, or low; finally, low; medially, falling, or level with a neighboring stressed syllable. The tune was said to be used in ordinary, definite, decided statements; or in commands, and exclamations; or in questions such as those with interrogative pronouns which do not require an answer of yes or no.

Tune Two was the same as Tune One, up to the last stressed syllable; that syllable was low, and on it or following it a gradual rise occurred, but rarely as high as the first stressed syllable. Its usage was said to be for sentences which are not so definite as the ones previously mentioned; facts may be implied rather than stated, or they may be presented in an indifferent, casual, or nonemphatic manner. Many--but not all--yes or no questions, were included, as well as requests, and polite and encouraging or formal statements, and phrases implying incompleteness.

Armstrong and Ward admit that this scheme is insufficient to record the full gamut of English intonation--"the writers are aware that there are other varieties and deeper subtleties of intonation than are here recorded," but it would appear that they are "...not essential for correct and good English...." Although they indicate considerable variety by way of special emphasis, or length, and various alternate heights of stressed and unstressed syllables, they do not work them into a basic system--presumably because such a classification would be too complicated for teaching to foreigners.

The analysis of Armstrong and Ward is valuable, in that it emphasizes the presence of some underlying resemblance of meaning or usage in all rising pitch contours--otherwise it would be impossible for foreigners, by using just one rising tune, to get anything approximately acceptable to us as native speakers of the language. The same is true of falling pitches.

These writers assert that "For practical purposes, however, the student will do well to remember that if the intonation is right, the stress does not greatly matter, for the result is English; whereas the stress can be right and the intonation wrong, and the result is not English." Practical phonetic alphabets, for foreigners, have usually symbolized stress rather than intonation. In fact, in much of the sample text which they provide, these authors themselves largely

abandon intonational marks--except, for example, for a sign to show general change of key in the middle of a sentence--and use stress marks instead. It would appear to me that their shift of orthography from intonation to stress was due to various factors: (1) Their intonation marks were expensive to print. (2) Primary pitch contours begin on stressed syllables, so that a mark for stress can be interpreted to mean that some primary contour, regardless of which one, must be made to begin there. (3) Their analysis failed to uncover the basic system of phonemic contrasts which must be symbolized before an adequate practical orthography can be attained; that is, their rows of dots are phonetic symbols rather than phonemic ones.[31] An attempt on the part of the phonetician to write every detail of sound which he can hear produces an unwieldy, complicated orthography for segmental sounds, and in addition it obscures the contrastive units which are basic to the system. This is at least equally true for intonation. In the analysis of Armstrong and Ward, the setting up of two tunes, even with their modifications, proves insufficient to symbolize adequately (i.e. structurally) the intricate underlying system of contours in contrast one with another.

Daniel Jones in his Outline of English Phonetics[32] has adopted and popularized the general scheme of Armstrong and Ward instead of continuing to use the material from his earlier Intonation Curves. It should be noted that he, also, was presenting materials for the teaching of English to foreigners.

Although Maria Shubiger[33] chose as her goal a scientific presentation of intonation rather than a pedagogic selection of tunes for foreigners to use, she failed to make any adequate advance in theory since she overlooked the significance of Palmer's work, and, instead, followed the two-tune scheme of Armstrong and Ward as a basic postulate: "The normal scheme of standard English intonation--for only standard English is taken into account--with its two main tunes, the falling and the rising one, is assumed as known." For this reason she fails to distinguish certain intonation contours which, for American English (and from Palmer's work we assume for British English also), are important. (One such set is probably the contrast between the 2-°4-3 and °2-4-3 intonation sequences in which stress and the beginning of primary contours are indicated by [°].)

In addition, at least two of her proposed advances appear to me to involve retrogression. One of these is minor: she uses a few arrows for intonation signs similar to Palmer's, in some of her text, but places them after the phrase modified instead of immediately before them. Since this is not accompanied by an indication of the syllable at which the most important part of the intonation contour begins, it leaves room for much ambiguity of a kind which Palmer avoided. A second defect is much more serious, because the assumption behind it appears plausible, at first, but in reality cannot be applied consistently and is incorrect. Instead of using the subgrouping of Armstrong and Ward's tunes according to the number of stresses in the phrase, she attempts to classify the permitted occurrences of the tunes according to grammatical structure. Starting with a pair of sentences which happen to differ both (1) by intonation and (2) by grammatical type, she implies that the difference in intonation is caused by the difference in grammar. A classification based on such data is invalid since it can be demonstrated that the identical grammatical structure can receive many other different intonations while, in turn, the intonation of either sample is not limited to any one grammatical construction or group of constructions at all, but may occur elsewhere in contexts which are supposed to be the exclusive domain of contrasting intonations. In other words, classificatory distinctions between intonation usages should not be forced into existence on the basis of evidence which is incomplete because of the suppression of alternate pronunciations of the constructions investigated. Shubiger, for example, (20, in a section entitled Intonation Determines word-classes and parts of speech), implies that a "numerical adverb" is essentially and exclusively present in the first of the two following sentences (with its stress and some unstated intonation pattern) but that the second illustration can include only an "indefinite adverb of time":

(a) We 'only 'went to the 'Lyceum ' once. numeral adverb.
(b) We 'only 'went to the 'Lyceum once. indefinite adverb of time.

Actually, the sentences are ambiguous; it is possible for either pronunciation to represent either grammatical construction. For example, in an optional pronunciation of the first sentence, the loss of stress on once could still leave it with a full numerical significance, with heavy contrast on Lyceum, so that the meaning would be something like this: "It wasn't the Orpheum to which we went only once, it was the Lyceum." The first would then become homophonous with the second. For this reason, a distinction based upon the implicit but false assumption that the two constructions have mutually exclusive intonations leads inevitably to confused overlapping of the parts of the classification, since the hypothesis cannot be applied consistently. (For further discussion and illustration of this problem, see 3.2.5).[34]

R. Kingdon[35] became convinced that stress should be indicated along with intonation. Utilizing a two-tune basis, he proposed a series of symbols combining rising, falling, rising-falling, falling-rising, and level tunes with two degrees of stress. For the sentence I can't find one, he presented a chart of sixty different possible intonations. For each of these he attempted to define the meaning; some of these meanings were incredulity, deprecation, impatience, mystification, surprise, contradiction, and so on. Three especially valuable characteristics may be observed in Kingdon's material. (1) The definitions of meanings are not bound by inconsistent grammatical classifications, but are stated in terms of their effect within a single context, and in terms of the attitude of the speaker toward his statement rather than the grammatical content of the statement. This approximates the assumption underlying the definitions of meanings which I have given in Section Four, for American English. (2) In addition, the relating of stress to the first part of an intonation contour is pointing in the right direction. (3) Kingdon also approaches more closely to presenting data which can be reinterpreted into a limited number of contrastive levels, than do Armstrong and Ward, or Shubiger.

On the other hand, Kingdon does not carry his analysis of meanings far enough to avoid heavy reliance on specific local context instead of a large number of diverse contexts; neither does he break up the intonations into sections, each with its own meaning and structural parts. Furthermore, his stress indication is helpful at the start of the intonations, but he appears to gain his point only at the cost of failing in many cases to indicate the important pitch of unstressed syllables at the end of them. Kingdon does not analyze intonation contours related to starting and ending points on a limited number of relative levels. He provides a symbolism for many characteristic melodies of English intonation in combination with stress, but does not achieve an analysis of the underlying structure of the intonation system itself.

### 2.1.4. Later American Studies

Much less work has been done on American than on British intonation.

Kemp Malone,[36] working independently of the other writers mentioned, arrived at conclusions which resemble those of Palmer which he had not seen. Like Palmer, he attempted (though not in as much detail nor with so thorough an analysis) to break up the intonation of a sentence into various parts--prefix plus dip, prefix plus down run, prefix plus dip beginning with drop and ending with lift, double or triple dip, gradient prefix plus double dip plus suffix, and so forth. His material includes an English text of Jones' which he compares to his own speech, with a few comments on the relationship of British and American intonation.

Hans Kurath[37] presented an entire story, in which he indicated "the drops and rise and the up-glides and down-glides of the voice, but not their exact intervals. For the sake of simplicity, only three levels are distinguished in the text..." (but in footnotes he described many departures from these). He symbolized these levels with a mark before each syllable; in addition he indicated the presence or absence of stress, and sudden versus slow rise or fall of pitch. In general, his analysis is phonetic, rather than phonemic or structural, since he records the pitch of each syllable instead of the contrastive pitch of the key syllables of meaningful contours. On the other hand, he has many excellent statements about the meaning of intonation in terms of attitudes of the speakers.

Leonard Bloomfield[38] in 1933 made a great forward step when he attempted to apply to intonation the principles which had proven so effective in the analysis of significant units of sound. In treating sound segments, he tried to symbolize only those units which were distinctive --that is, phonemic--as proven by the fact that they were the smallest replaceable parts in words such as pin, fin, sin, and tin. Intonation phonemes were found to be secondary, in that they were not "attached to any particular word or phrases," and do not constitute a basic part of those units, but may "vary with differences of meaning, in otherwise identical forms."

Bloomfield mentions that "it is not easy to define the cases where features of pitch have in our language a genuine status as secondary phonemes." The reason given is that many "socially effective but non-distinctive" gesture-like patterns of pitch, in talk which is harsh, sneering, petulant, caressing, cheerful, and so on, border very closely upon genuine linguistic distinctions. Nevertheless, he postulated several intonation phonemes, especially at sentence ends, where the phenomena were clearest:

The symbol [ . ] represented a "falling pitch" or "final-pitch" (apparently it corresponds to the °2-4 and °3-4 primary contours described, in this monograph, in Section 4.1.1). The inverted question mark [¿] is less clearly defined; on page 92 he gives it a description as "rising-falling" whereas on 114 he states that (in contrast to the "rising pitch" of [?]) the [¿] has "a lesser rise at the end." (I conclude that the symbol [¿] was used to represent both the °2-4 and the °2-4-3 contours--the first of which ends with a fall, and the second with a slight rise--for which see below, 4.1.1. and 4.1.4; both of these can easily be used on the examples he gives.) The comma [,] apparently represented several intonation contours (probably at least °3-2 and °2-3), since it "consists of a rise in pitch before a pause within a sentence" (115) or "the pause, often [but not always? KLP] preceded by rising pitch, that promises continuation of the sentence" (92). As a fifth type, he gives exclamatory pitch [!] which can modify either of the first three types.

It would appear that his analysis should be carried further, so as to find the various intonations represented by each of his symbols, and to extend the analysis to earlier contrastive parts of the intonations. Moreover, the partial tendency to define usage in terms of grammatical placement leaves uncertainty of classification, since some of his finals can appear medially in the sentence, and vice versa, while some of the pronunciations of supplement questions and yes or no questions, may at times utilize the same intonation as that found on statements. The distinctiveness of meaning, therefore, must not be defined by the grammatical sentence type in which the intonations occur, but by the attitude of the speaker at the time the utterances are given. (For yes or no questions with falling pitch, see Sections 4.1.1. and 4.1.3. In the first of these sections, certain puns are analyzed which depend for their effectiveness upon the potential homonymity of Bloomfield's [¿] and [.]; in the second, an utterance is given in which the same phonomenon results in an ambiguity which puzzles the listener. For general discussion of the problem of definition of intonation meanings, see 3.2.5.)

Later, Bernard Bloch and George Trager[39] adopted this system, but added to it two symbols, for suspensive and contrastive pitch, respectively.

In 1942, in my volume on Pronunciation (p. 32, Vol. I of An Intensive Course in English for Latin-American Students, in the materials of the English Language Institute), there appeared a further contribution already referred to in Section One. I there stated that "The question to be asked for an intonation system, therefore, is how many relative levels there are, in particular languages, which are significant; and (33) "English has four significant contrastive [i.e. phonemic] levels." This followed Bloomfield's attempt at a phonemic analysis of intonation, but arrived at smaller significant units--the levels of the key points, as significant to the structure of the meaningful contours themselves. In addition, there was an analysis of different types of contours (there called peg-post-peg patterns, pre-peg patterns, etc. corresponding here with the more descriptive terms of primary contours and precontours), and a chapter (66-86) on "A sketch of significant English pitch patterns" which presented the over-all structural