

The American Four-Level Analysis of Intonation Contours Historical postscript*

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1. Introduction

During the 1940s, American structural linguists developed a phonological analysis of pitch contours in languages like English, based on the idea that there are four pitch level ‘phonemes’ — Low, Mid, High and Overhigh — that occur at certain points in an utterance. The first widely cited statements of this analysis and its theoretical foundations are by Kenneth Lee Pike (1912–2000) and Rulon S. Wells (1919–2008); both appeared in 1945 (Pike 1945, Wells 1945). Though there are some important differences between Pike’s and Wells’s versions, the idea of phonemic pitch levels came to be seen as the essence of the American approach.

The four-level analysis was widely accepted in American linguistics until the 1960s, as can be seen from the presentation in Trager & Smith’s classic *Outline of English Structure* (1957 [first published 1951]) and textbooks like Gleason (1955) and Hockett (1958). During the same period, British phoneticians (e.g., Kingdon 1958, O’Connor & Arnold 1961) continued to describe English intonation in terms of the general ‘nuclear tone’ approach first set forth by Palmer (1922), in which local pitch configurations such as ‘fall’ and ‘fall-rise’ accompany prominent syllables. The difference between these two approaches came to be known as the ‘levels-vs.-configurations’ controversy, the phrase being taken from the title of an influential article (1951) by Dwight L. Bolinger (1907–1992). Bolinger first raised his objections to the four-level analysis in two separate reviews (1947a, b) of Pike (1945) and then in a general theoretical article two years later (Bolinger 1949), but it was the 1951 paper that served to establish levels-vs.-configurations as the premier theoretical controversy in the study of intonation. This issue remained central for three decades, until it was effectively resolved in the early 1980s by Janet Pierrehumbert’s Ph.D. thesis (1980).¹

I have previously reviewed the levels-vs.-configurations debate in an earlier article (Ladd 1983) and in section 2.3 of my book *Intonational Phonology* (2008), and

* I am grateful to John Joseph for encouraging me to write this article, and to Wyn Roberts, an anonymous referee, and the editor for comments that improved the presentation. I also thank the anonymous referee for providing a quote from the 1945 Annual Report of the University of Michigan Press that confirms the 1945 publication date of Pike’s Intonation monograph.

¹ Pierrehumbert posited only a two-way pitch level contrast between Low and High, and treated finer details as a matter of phonetic implementation rather than phonemic distinction. At the same time, she recognised the existence of ‘pitch accents’ (Bolinger 1958), though she analysed them as combinations of level tones (e.g., Low+High). The resulting analysis is in many respects comparable to the British nuclear tone approach, and transcriptions based on one system can generally be translated straightforwardly into the other (Roach 1994).

the purpose of this paper is not to revisit the issue itself. (I would, though, like to acknowledge my earlier failure, especially in Ladd 1983, to appreciate the extent to which Pike's ideas differed from Wells's.) Rather, I want to investigate the notionally contemporaneous publication of Wells's and Pike's works. During the 1950s and 1960s it was certainly Wells's version of the four-level analysis, rather than Pike's, that was taken over by George L. Trager (1906–1992), Henry Lee Smith, Jr. (1913–1972), Charles F. Hockett (1916–2000), and others, and Trager, at least, clearly assigned credit for the basic idea to Wells. Yet the publication record strongly suggests Pike's priority, and the new evidence I report here — an exchange of correspondence I had with Pike in 1989 — makes it quite clear that Pike felt he had not been given proper credit for his contribution.

There may be some intrinsic usefulness to correcting the historical record, and it might be interesting to speculate about what could have happened if Pike's version — which in some respects is remarkably similar to what Pierrehumbert eventually came up with a generation later — had won general acceptance in the 1950s. As far as I can see, though, the only broader significance to the story of how Pike's analysis was received is to remind us of how a dominant group within a field can enforce its dominance, and to show that this was as true of the Bloomfieldian era as it is of more recent times.

2. *The publication record*

The two 1945 publications presenting the four-level analysis are Pike's monograph *The Intonation of American English* and Wells's article in the March 1945 issue of *Language* entitled "The Pitch Phonemes of English". Wells's paper is short and focused on the theoretical principles involved in the phonemic analysis of suprasegmental phenomena; Pike's monograph includes substantial discussion of the more general issues involved in analysing intonation and extensive illustrative material. In Pike we also find a long footnote 40 (1945: 176-179) that begins "Since this present manuscript on intonation was submitted for publication two further items of interest have appeared"; one of the two "items of interest" is Wells's paper, and Pike devotes two pages (all in the same footnote!) to discussing Wells's analysis. Wells does not cite Pike. On the face of it, this suggests that Wells deserves priority for the four-level idea, or that, at the very least, this is one of a long line of instances in which two people come up with the same idea at the same time.

However, Pike's preface (1945: v) makes clear that the monograph is not the first presentation of his analysis. It begins:

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 the earlier work, expanding and revising it.

It is possible that Wells was unaware of Pike's earlier work, but the *Intensive Course*, under the general supervision of Charles Carpenter Fries (1887–1967), was well known at the time (see Paratore 1959, for a discussion of the *Course*'s wide influence). Moreover, during the Second World War many American linguists were involved in language teaching as part of the war effort, and Wells was no exception (Insler 2008). It therefore seems fair to say that Wells could have been expected to know that Pike was working on intonation for pedagogical purposes. Regardless of what Wells knew, though, Pike's claim to priority seems clear.

Finally, it should be noted that there is some confusion about the date of Pike's monograph. Its copyright date is 1945, and it is normally cited (e.g., by Crystal 1969, by Bolinger 1972, in the Education Resources Information Center (ERIC) database at eric.ed.gov, and by Google Scholar) as having appeared in 1945. However, my own dog-eared copy of the monograph is dated 1946 on the title page (the 1945 copyright date appears on the reverse of the same title page), and there are sporadic later citations that give the 1946 date (e.g., Morgan 1953, DeCamp 1968, Giegerich 1980). Wells's review (1947a) of Pike's monograph in *Language* gives 1946 as the publication date, as does Trager (1964). It may be that 1946 refers to the date of a second printing (see further section 4 below). None of this alters the fact that Pike's analysis had previously appeared in published teaching materials in 1942 and 1943, well before Wells's 1945 paper.

3. *Evidence from secondary literature, 1947–1972*

The establishment of the four-level system as the orthodox American structuralist analysis of English intonation was due largely to its incorporation into Trager & Smith's influential *Outline of English Structure*. Trager & Smith say simply (1957: 41):

Extensive testing of spoken English material has convinced us of the correctness of the independent conclusions of Pike and Wells that there are four pitch phonemes in English. Our presentation of the supporting data will be in terms of this conclusion.

Trager & Smith (1957 [¹1951]) were also responsible for the general adoption of Wells's numbering convention rather than Pike's, using 1 for Low and 4 for Overhigh rather than the reverse. The two principal introductory linguistics textbooks of the 1950s, Gleason (1955) and Hockett (1958), follow Trager & Smith with only minor variations, though Henry A. Gleason (1917–2007) regretfully mentions the existence of the two opposite numbering systems (1955: 47).

(In view of Trager & Smith's acceptance of Wells's level-numbering convention, it is noteworthy that Wells, in discussing intonation in his subsequent paper "Immediate Constituents" (1947b), actually uses Pike's convention rather than his own. He explicitly states (his footnote 23) that he is following Pike, and does not mention his own 1945 paper. This suggests that the widespread adoption of Wells's numbering scheme was due primarily to the influence of Trager & Smith, and certainly seems to rule out the possibility that Wells himself deliberately attempted to marginalise Pike.)

Trager & Smith's reference to the "independent" conclusions of Pike and Wells might appear to suggest that they considered the emergence of the four-level analysis to be a case of simultaneous discovery (i.e., that the conclusions of Pike and Wells were arrived at independently of each other). However, their statement is ambiguous

in context: it can also be read as meaning that the conclusions of Pike and Wells were independent of Trager & Smith's! It is impossible to establish directly which meaning they intended, but a subsequent short paper by Trager (1964) points to the latter interpretation. Trager states: "In *OES* [= Trager & Smith 1957] we accepted and started from the basic analysis of English pitch made by R. S. Wells and extensively applied by K. L. Pike." (In the bibliographical footnote to that sentence Trager gives the date of Wells's paper as 1945 and of Pike's monograph as 1946.) Trager thus unambiguously assigns priority to Wells and considers Pike's work derivative.

Bolinger, however, equally clearly assigns priority to Pike. In his introduction to the 'Theory' section of his *Intonation* anthology, he says (1972: 50):

Kenneth Pike was the first American structuralist to attempt more than a programmatic treatment of intonation. [...] Other American linguists, notably Zellig Harris and Rulon Wells, held similar views, but with Pike the position of American structuralism on intonation was pretty well fixed. His approach still typifies the work done by the far-flung Summer Institute of Linguistics, and in modified form it is the one adopted by Trager and Smith [...].

It was the marked difference between Trager's and Bolinger's version of events that led me to embark on the correspondence reported in the next section.

4. *Correspondence with Bolinger and Pike, 1989*

In early 1989 I began work on the first edition of my book *Intonational Phonology* (2008, first edition 1996). I wrote to Bolinger (with whom I had corresponded for many years), asking him about the discrepancy between Trager's assessment and his own assessment of the priority for the four-level analysis. He replied (6 Feb. 1989): "You ask about who was first with the four levels. I've looked at everything I have here and can't find an answer. Why not write to Ken and put the question directly? Posterity will thank you." Whether this is actually a matter of great concern to posterity is doubtful, but I did write to Pike (on 19 Feb. 1989), and he seemed to welcome an opportunity to set the record straight. In reply to my letter (which came, it should be remembered, from a complete stranger, as he and I never met) I received an eight-page single-spaced (word-processed) letter, dated 21 March 1989 and with a postscript dated 28 March. The letter rambles somewhat,² but six of the eight pages deal primarily with the four-level analysis and the question of its origins, and two with a different question (tone-intonation interactions) that I had also enquired about. After two short introductory sentences thanking me for getting in touch, he begins (p. 1):

History can be extraordinarily difficult to understand. It depends on people (and we are not always exact in documenting our memories or deductions) and on a climate of the times, which may comprise a hidden component of our view of the reality of the currently available material.

This is not the most obvious way to begin a straightforward response to a factual question from an unfamiliar correspondent.

The letter goes on (pp. 1-3) to sketch the development of Pike's contributions to the Michigan English-teaching materials in some detail, emphasising among other things the dates when various things appeared in print. It then (p. 4) discusses why

² My initial query and Pike's reply are reproduced in full in the appendix.

Trager might have treated his work as derivative of Wells 1945. Pike notes first of all that Trager dates the monograph to 1946, “which was the SECOND PRINTING [emphasis in original] of my Intonation — not the first (and copyrighted) printing” and speculates that perhaps “he had not noticed the earlier date”. But he also comments that Trager would have had to overlook or ignore the detailed publication history sketched in the preface to the monograph (see section 2 above). Finally, he comes to what he seems to see as the heart of the matter, and it is worth quoting him at some length (p. 4):

But I suggested above [i.e. in the opening paragraph of his letter, just quoted] that *the intellectual climate may have affected his judgment* [emphasis in original]. Consider this: He was a close collaborator, and co-author, with [Bernard] Bloch [(1907–1965)], who was then editor of *Language*. Bloch rejected my early (1943) volume on Tone. He rejected also the Intonation — in fact, I was in Bloch’s office at Yale, with Bloch present, when Bloomfield entered, and recommended to him in my presence that he publish the Intonation (in the [*Language*] monograph series). Bloch rejected it. [...] In addition Bloch also rejected my article on Grammatical Prerequisites to Phonemic Analysis (which I later published in Word [Pike 1947a]). Somehow or other, I think he thought that my material was *not ‘scientific’* [emphasis and scare quotes in original] in relation to the definition needed to meet his standards — and perhaps because I was applying it to field data, rather than using it in abstract discussion only.

Later in the letter Pike goes back to the question of priority, specifically addressing the suggestion by Trager & Smith (quoted above) that the conclusions of Pike and Wells were “independent”. He says (p. 7):

So I took the liberty of telephoning Wells, in Yale (I have known him for some time) to ask him if he could clarify the situation – that I had no data as to when or how he had gotten started. He offered to write you a note (I will send him a copy of this letter and urge him to do so) – but (if I understood him correctly) he did feel that his material had been done independently of mine.

Pike enclosed a copy of his cover letter to Wells with his long reply to me. He says to Wells:

Thanks ever so much for offering to write to Ladd. Best wishes in your effort to get history on the record, as best you can remember it. If you find mistakes in what I have written, please don’t hesitate to write us about it. (It will take several of us working together to get our memories tied in to the “old track” of 45 years ago!).

I never heard from Wells, whom I never met, nor did I feel it appropriate to pursue the matter with him. Much of Wells’s later career — after a few extremely influential structuralist papers in the 1940s — was devoted to semantics and the philosophy of language, and he was presumably reluctant to devote time and energy to elucidating the history of a clearly defunct idea in phonological theory.

The conclusion of this investigation is perhaps best summed up in what Bolinger went on to say in the letter in which he encouraged me to write to Pike. After summarising the bibliographical evidence sketched in section 2 above, he says in his one-page letter:

So as far as concrete evidence [i.e. published material] that I actually have is concerned, Pike takes the palm. But who knows what private or informal discussions may have been going on for a long time. What does seem a little

puzzling is that if Pike did get there first, Wells writing two or three years later would not have given him credit (and maybe scolded him for reversing the numbers). Conclusion from that is one of three things:

Wells was Rude.
Wells was Ignorant. or,
Wells got there first.

The letter ends there, and Bolinger does not speculate further.

5. *Bloomfieldian orthodoxy*

There is, as I suggested in the introduction, no elaborate moral to this story. But it does provide evidence for Stephen Murray's view (Murray 1994, chap. 7) that there was a Bloomfieldian orthodoxy that was enforced through personal networks and control of access to publication. Against the backdrop of charges and counter-charges about abuses of personal and institutional influence in generative linguistics over the past few decades (e.g., Huck & Goldsmith 1995, Newmeyer 2014), it is useful to acknowledge that the general phenomenon is not new. In Murray's words (1994: 164), "Bloomfield wielded 'scientific', Bloch and Trager wielded 'rigorous' with the same self-assurance and contempt for the benighted with which Chomsky et al. later wielded 'interesting' and 'theoretical'".

It seems unarguable that Pike struggled to get a hearing for his theoretical critiques of mainstream structuralist ideas, in particular his rejection of the doctrine of strict 'separation of levels' (Pike 1947a). Wells's review (1947a) of Pike's *Intonation* monograph was long and broadly complimentary about much of what Pike had achieved, but dismissed Pike's account of the phonology of intonation on the grounds that it was incompatible with the principle of complete separation between phonological and grammatical analysis. However, as just noted, Wells wrote little more on phonology or intonation after 1947, and unlike Trager and Bloch, he seems not to have been very interested in enforcing Bloomfieldian orthodoxy. By contrast, Trager vigorously attacked Pike in at least one long review (Trager 1950), and Bloch as editor of *Language* rejected at least two of Pike's most important works (the 1945 monograph and the 1947a paper on "grammatical prerequisites"). Trager seemed eager not only to criticise, but to discourage others from even coming into contact with Pike's ideas. Of Pike's monograph *Phonemics: A technique for reducing languages to writing* (Pike 1947b), Trager (1950: 158) said that he must "condemn the book as a theoretical work, and even more as a textbook – since as the latter it will lead astray many who might otherwise be valuable workers in linguistic science."

It is also fairly clear that Pike's commitment to applications of linguistics, and in particular to missionary work, limited the extent to which he participated fully in Bloomfieldian networks (see Murray 1994: 158, 172-174 and 185-190 *passim*). (Among other things, this makes Bolinger's reference to "private or informal discussions [that] may have been going on for a long time" rather implausible as an explanation of Wells's failure to cite Pike; if anything, it seems more likely that Wells was genuinely unaware of what Pike was doing.) Elaborating on the remarks in his letter to me about the "intellectual climate" that may have affected Trager's judgements, Pike notes Trager's objections to the applied focus of Pike (1947b), and concludes: "Hence Trager might have found it easy *or even appropriate* [emphasis added] to ignore [Pike's] 1942 Pronunciation, which was aimed at language teachers." The apparent equanimity behind the phrase "or even appropriate" is remarkable, and Murray is surely correct when he explains such attitudes on the part of missionary

linguists generally: “Because their involvement with linguistics was instrumental — their vocation was as missionaries, not as linguists — denials of recognition were less important to them than to those committed to academic careers and disciplinary recognition” (Murray 1994: 189-190). That is, although the overall tone of his letter to me certainly suggests that the early reception of his intonation analysis still rankled, Pike himself seems to have accepted that his applied orientation and his missionary commitments might explain or even justify some of the reactions that his work elicited.

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SUMMARY

The four-level analysis of English intonation prevalent in American structuralist work from the mid-1940s to the late 1960s is variably credited to 1945 publications by both Kenneth Lee Pike (1912–2000) and Rulon S. Wells (1919–2008). However, Pike’s work was the basis of published language teaching materials as early as 1942. The author reports a brief correspondence with Pike in 1989, which makes clear that Pike felt that his own contribution was underappreciated in the “intellectual climate” of Bloomfieldian linguistics. Bernard Bloch (1907–1965) and especially George L. Trager (1906–1992) appear to have influenced the reception of Pike’s work and to have overstated the credit due to Wells.

RÉSUMÉ

L’analyse de l’intonation anglaise usuelle aux temps du structuralisme américain (vers 1945–1970) — système à quatre niveaux dits ‘phonèmes’ — est attribuée soit à Kenneth Lee Pike (1912–2000), soit à Rulon S. Wells (1919–2008), tous deux ayant publié leurs versions de cette analyse en 1945. Il faut cependant noter que le système de Pike fut utilisé dès 1942 dans un cours d’anglais langue étrangère. En 1989 l’auteur a échangé des lettres avec Pike, d’où il ressort que celui-ci trouvait que sa contribution au développement de l’analyse américaine n’était pas suffisamment appréciée par ses collègues de l’école de Bloomfield. À l’avis de l’auteur, Bernard Bloch (1907–1965) et surtout George L. Trager (1906–1992) furent responsables d’avoir minimisé la contribution de Pike, en faveur de celle de Wells.

ZUSAMMENFASSUNG

Die Vier-Ebenen-Analyse der englischen Intonation, die in den Arbeiten des amerikanischen Strukturalismus (in der Periode ca. 1945–1970) üblich war, wird sowohl Kenneth Lee Pike (1912–2000) als auch Rulon S. Wells (1919–2008) zugeschrieben, da beide Autoren 1945 wichtige Aufsätze zu diesem Thema veröffentlicht haben. Die Analyse von Pike wurde allerdings schon 1942 in Unterrichtsmaterialien zu Englisch als Fremdsprache verwendet. Aus einem Briefwechsel, den der Autor 1989 mit Pike geführt hat, geht hervor, dass dieser die allgemeine Bewertung seines Beitrags im ‘intellektuellen Klima’ der Zeit als unzureichend empfand. Es hat den Anschein, dass Bernard Bloch (1907–1965) und insbesondere George L. Trager (1906–1992) eine wichtige Rolle in der Abwertung des Beitrags von Pike gespielt haben, zugunsten des Beitrags von Wells.

APPENDIX

Correspondence with Pike, February–March 1989

I reproduce here, in their entirety, the texts of the letter I wrote to Prof. Pike posing the basic question about priority for the development of the four-level analysis of intonation, and his reply. Because Pike’s style and some of his usages are rather idiosyncratic, I have applied only the very lightest editorial hand to the text of his letter. I have corrected a few obvious typing errors but have made no attempt to normalize his variable use of punctuation, capitalization, etc., or to edit sentences that he himself would undoubtedly have edited in a more formal context. Comments, explanations, and references that I have added are in the form of footnotes; any material appearing in square brackets is from Pike’s own text. Page beginnings in the letter are indicated as follows: //p. 3//.

Ladd to Pike:

[Edinburgh Linguistics letterhead]

19 February 1989

Prof. Kenneth L. Pike
Department of Linguistics
University of Michigan
Ann Arbor, Michigan
USA

Dear Prof. Pike,

I am currently writing a book on intonational phonology, which will include some discussion of the background to current theoretical ideas and in particular of the “levels vs. configurations” controversy. I had always assumed that you were the originator of the 4-levels analysis, and that the Wells-Trager-Smith orthodoxy was

based on your work. (This is certainly also what Dwight Bolinger suggests in his Penguin Intonation anthology.) But looking back more carefully at this question now, I discover that Trager, in his Daniel Jones festschrift article (also in the Penguin anthology), credits Wells with the analysis and says simply that you “extensively applied” it. I’ve written both Dwight and Chas. Hockett, whom I’ve known for a long time, to see if they can shed any light on this, but since I’ve never had the honour of meeting you I had hesitated to write you as well. Now, however, I’ve heard back from Dwight that he’s actually rather puzzled by what he finds in the early materials and he suggests I write to you directly. If you are able to give me any insights on the early history of the 4-level idea I would be extremely grateful.

On another related matter, I’m also curious about what you (plural) thought about the interaction of tone and intonation during the heyday of the 4-level analysis. In both your Tone Language and Hockett’s Manual of Phonology I find a willingness to accept an analysis in term of an overall tune with local perturbations for the lexical tones for languages like Chinese. But surely this contradicts the express linearity of your analysis of English intonation, an analysis that (I assume) you must have seen as superseding overall tune models like Armstrong and Ward’s. My question is, did any of you discuss this contradiction back then? Did you have any other ideas about how to deal with languages like Chinese? (Elsewhere you also talk about languages where the end of the phrase is available for extra “intonational” tones, which is obviously a lot more compatible with a linear model.) As I’m sure you’re aware, this whole question is very much a matter of interest in autosegmental theory these days—trying to reconcile theoretical linearity with apparent interaction of long-domain tunes—and I would be very interested in anything you could tell me about the ideas you had about this when the linear analysis of pitch was just beginning to take hold.

I am currently on sabbatical, at 22 Church Lane, Madingley, Cambridge, CB3 8AF, which among other things explains that lack of a proper address for you (no LSA address list with me!). I do hope that this reaches you and will be very grateful for answers you can provide me with.

Yours sincerely,
[signed Bob Ladd]
D. Robert Ladd

Pike to Ladd:

7500 West Camp Wisdom Road, Dallas, TX 75236

Mar. 21, 1989

Dr. D. Robert Ladd

22 Church Lane, Madingley, Cambridge CB3 8AF Great Britain

Dear Dr. Ladd,

It is a delight to converse with someone else who finds fun in intonation! Thanks for writing—and thanks for contacting Dwight Bolinger, who told you to write me.

History can be extraordinarily difficult to understand. It depends on people (and we are not always exact in documenting our memories or deductions) and on a climate of the times, which may comprise a hidden component of our view of the reality of the currently available material.

You say that you had ‘always assumed’ that I was ‘the originator of the 4-levels analysis.’ That is true, so far as the earliest suggestion of a four-level system, and my personal (undoubtedly incomplete) knowledge of its development, is concerned—but that does not rule out the possibility of ‘simultaneous (or near-simultaneous) discovery’—which happens here and there. Let me point out the data and source of my stimulus and publication on American English intonation, plus a (perhaps wild) hunch or two as to a possible source of a historical misinterpretation by Trager (whom I have considered for years to be a mutual friend, in the face of differences to be mentioned).

(1) Have you checked out *An Intensive Course in English for Latin-American Students*, by the research staff of the ELI, Charles C. Fries, Director—with Vol. I being *PRONUNCIATION* by Kenneth L. Pike, 1942? If not, you should try to do so. (The work of the Institute was very widely known, early, since it was the first, so far as I know, in the USA; my volume might conceivably be in some library over there). My four-level analysis was worked out extensively (not a brief mention, nor a short article) for, and published within, that volume—and mentioned in print by Prof. Fries in various places in the Institute publications.

(2) Note my 1942 volume, page 33, where ‘English has four significant contrastive levels; named as extra-high, high, mid, and low (and numbered from one to four).

But note carefully (in relation to work of other scholars, who deal more intensively with long stretches of intonation) that variation in spread of intervals is discussed there, also—and diagrammed on page 34 as allowing the four levels to contrast at the beginning, or/and at the end, of a long phrase sequence, but with radical dropping in general pitch from the first part to the end, without changing the contrast between local contours in a particular section of that sequence of contours.³ Similarly, there is //p. 2// discussed (p. 35) the relation to a syllable sequence, with stressed syllable, preceded or followed by unstressed ones, in structural patterns. Various modes of symbolizations are also given (e.g. pp. 38, 41).

By page 53, meanings are discussed for certain of the pitch sequences; and single slash versus double are being used for contrast of contour endings (with the contour having a nucleus—a peg or head—which is a stressed syllable, followed by a part of a syllable, or several unstressed syllables, and preceded optionally by others).

By page 67, contrast between various contours are given (beginning with the stressed nucleus)—e.g. ‘2-4, ‘2-3, ‘2-1, and level ‘2, followed on pages 69-73 with ‘2-4-3, ‘3-2, ‘3-1, ‘3-4, ‘4-3, ‘4-2, ‘4:, ‘4-3-4, ‘1-3, ‘1-2, ‘1-4-3. Pre-peg slurring comes on pp. 75-78.

Phrases larger than the simple contours (Complex Intonation Patterns) come on p. 72-73, with compounding on p. 87 (areas of special interest to some later students of intonation), and with slow speech and stylistics on p. 92, plus voice quality features on pp. 93-95, with more extensive work discussing such things in my 1945 volume (which seems to me to have anticipated much work, later, by other scholars—e.g. Trager who, so far as I can recall without checking in detail, does not refer to these materials).

³ This is one of the points on which Pike clearly anticipated Pierrehumbert 1980.

(3) But this was much too much for beginning foreign students to use in early lesson plans, so I suggested for the 1943 Institute pedagogical publications the restricted use of my high-mid, high-low, mid-high, and high-low-mid contours for practical lessons.⁴ And the detail, for technical delight, and the study of English in its more factual detail, was placed in the fall of 1944 and spring of 1945, into my more theoretically-developed Intonation of American English. Note, furthermore, that in the Preface to 1945 (p. v) that it *expressly discusses* the 1942 material. And in the 1945 volume the history of the discipline, and my relation to it, was made as explicit as I knew how to do.

(4) But since you ask about my feeling about the ‘interaction of tone and intonation’, you need to be sure to understand how and why I tackled the study of intonation in 1942:

(a) When I started on English intonation in 1942, at the ELI, I had come from several years work on the tone of the Mixtec Indian language of Mexico. From 1935–1937 I was blocked in finding a good solution. In the summer of 1937, Sapir pointed out to me how he used a “frame” (a place in a phrase, where one word would remain constant in tone and meaning, while at another place in the same phrasal frame there could be replacements of various members of a set of words, such as any one of a set of nouns for example).⁵ The contrast of the respective pitch of the replaced words with an unchanging pitch of the frame word, allowed the phonemic contrasts between the pitch or pitch sequences of the replacing set of words to be identified, and to be seen as an important component of a total tonal system. //p. 3// (See index to Sapir, in my *Tone Languages* 1948, first published in mimeo 1943, for reference to Sapir.)

(b) In Michigan, when Aileen Traver, secretary of the Institute, was unhappy about the pronunciation of the pitch of a Brazilian, and asked me to help find out why, I turned to Bloomfield’s book 1933 to see the use of pitch for question, and so on, there (with a few different types at clause ends); and I checked out the British materials of Jones and so on. But these did not do what I needed; they did not explain the difficulty we were facing.

(c) So I tried using INTONATION FRAMES (analogous to my use of tone frames) at PARTICULAR PLACES in a LONGER STRETCH of English speech, to seek whatever set of contrasts I would find. THIS LED TO THE CONTRASTIVE TYPES OF CONTOURS REFERRED TO, AND REQUIRED THE FOUR LEVELS, with contrastive, substitutable, contour patterns.

(d) But one or more members of this same set of contrasts could come SEVERAL TIMES at various places in sequence IN A SENTENCE, and could come EARLY OR LATE in the sentence, even though the GENERAL SENTENCE PITCH HAD DROPPED—as in the diagram on 1942:34.

(e) And this latter insistence is at the basis, probably, of much of the difference between my work and that of some subsequent writers who give more prominence to the relevant drift than to the local contrastive sets.

(f) The set of contrastive contours (with or without pre-peg (pre-nucleus) COMPRISED A SYSTEM—not a mere listing of several kinds—with definable

⁴ Note that such contours correspond in general function to British nuclear tones. Of the four listed here, the last three are clearly equivalent to British fall, (high)-rise, and fall-rise.

⁵ In his note of 1984, “Some Teachers who Helped Me”. *Historiographia Linguistica* 11:3.493-495, Pike recounted pp. 493-494 the circumstances under which Edward Sapir (1884–1939) explained to him the treatment of ‘tone’.

SEMANTIC PARAMETERS AND FORMAL ONES TOO. (See the chart in my *Linguistic Concepts* 1982:93, published earlier in 1964⁶).

(g) In writing my book *Tone Languages*⁷ in the fall of that same year, 1942, and the spring of 1943 (published in mimeographed form copyrighted then, 1943), I had to comment, also, on the impact of intonation overlying classical tone of tone languages. In Mixtec, this meant that the general height could be high under intensity, or low around a campfire, without changing the particular tones. And calls could in fact affect the lexical tones. (See the 1948 edition, in the Index, under Intonation, as well as under Mandarin and Chinese.) And in my *Phonemics* book, 1947:115, note the astonishing intonation changes for one simple sample of Mandarin—with pitch contrasts often retained, when sharply different emphases are placed at different places in a sentence (with all of the lexical tone contrasts retained—I was told by a native speaker, analyst of tone, a few days ago—but my couple of hours at that research point was insufficient to be sure of that, as you can see by reading the comments.)

(5) WHY, then, did Trager say (in *The Intonation System of American English*, in the volume *In Honour of Daniel Jones*, 1964:267) that he ‘accepted and started from the basic analysis of English pitch made by R. S. Wells and extensively applied by K. L. Pike’?

//p. 4// (a) He referred to the 1946 date, which was the SECOND PRINTING of my *Intonation*—not the first (and copyrighted) printing. (Four printings had appeared by 1949, and stated as such on the backs of the title pages). One may hazard a (perhaps false) guess that he had not noticed the earlier date, and therefore that Wells paper of 1945 seemed to him to have been published a year earlier.

(b) But either he did not read the Preface of the 1945 edition carefully, (p. v), or he did not treat it seriously, since it stated clearly enough that the 1945 book was based on the prior publication of the *Pronunciation* book of 1942, so that he might have been able to see there that the 1942 book had in fact treated the system of pitch based on contours of the four levels in much more formal structural detail than various following publications by other scholars did.

(c) But I suggested above that *the intellectual climate may have affected his judgment*. Consider this: He was a close collaborator, and co-author, with Bloch, who was then editor of *Language*. Bloch rejected my early (1943) volume on *Tone*. He rejected also the *Intonation*—in fact, I was in Bloch’s office at Yale, with Bloch present, when Bloomfield entered, and recommended to him in my presence that he publish the *Intonation* (in the monograph series). Bloch rejected it. (Incidentally, Bloomfield had written me a note saying something to the effect that the book was about the only thing on intonation that he had found interesting—the exact words I do not have at hand.) In addition Bloch also rejected my article on *Grammatical Prerequisites to Phonemic Analysis* (which I later published in *Word*). Somehow or other, I think he thought that my material was *not* ‘scientific’ in relation to the definition needed to meet his standards — and perhaps because I was applying it to field data, rather than using it in abstract discussion only.

This hunch is related to Trager’s review of my *Phonemics—A Technique for Reducing Languages to Writing* (1947 edition—earlier, in a shorter form, published and copyrighted in mimeo in 1943). Trager’s review (in *Language* 26:152-58, 1950)

⁶ Pike, Kenneth L. 1982. *Linguistic Concepts: An introduction to tagmemics*. Lincoln: University of Nebraska Press.

⁷ Pike, Kenneth L. 1948. *Tone Languages*. Ann Arbor: University of Michigan Press.

affirmed (p. 129)⁸ that he ‘must condemn the book as a theoretical work, and even more as a textbook—since as the latter it will lead astray many who might otherwise be valuable workers in linguistic *science* [italics added]’. And (p. 152) ‘Usually textbooks are not reviewed in scientific journals.’ And he objects to the subtitle, since (p. 153) the discipline of linguistics ‘has nothing to do, as a part of linguistics, with writing’ [or presumably other pedagogical matters]. Hence Trager might have found it easy or even appropriate to ignore the 1942 Pronunciation, which was aimed at language teachers.

(6) You ask further about ‘overall tune with local perturbations for the lexical tones for languages like Chinese.’ And add that ‘surely this contradict the express *linearity* [italics added] of your analysis of English intonation.’ //p. 5// Last April I was asked in the USSR to write an article about intonation. I have been unable to complete it, under other pressures. But I should be able to explain more clearly than I did in 1942, or 1945, the apparent contradiction in my material, implied by your question—but without deleting any of the technical analytical material either from those books, or from the Tone Languages of 1943/1948. How?—

(a) First, note that in a “short” frame as *part of* a longer clause or sentence, that the substitution list as a *set* of contours is “*localized*”, in a way analogous to the substitution list of words in a tone language frame, where whole words may have local tonal patterns in particular contexts. In this sense, the English intonation contours, from my perspective, are not *just* linear, but are “locally replaceable” parts. This, note, is a crucial part of my starting English intonational system.

(b) In 1959 I published an article (biblio is in my book Language) on Language as Particle, Wave and Field.⁹ I will use it here, to let you see how I understand the headache you imply—but with *complementation*, not contradiction:

If one deals exclusively with phonemes as they occur in words, or with morphemes as in sentences, those small items are seen as “*particles*”, replaceable in word or sentence frames,” treated as almost separate, and linear.

(c) But these items occur as members of *sets* of particle, in *positions* in *part-whole hierarchies* of larger items. Sounds are in syllables, syllables in phonological words, which in turn are in larger *emic units* up to the phonological structure of text, poems, or conversations. Of the post-Bloomfieldians, I was for some time almost alone in dealing in syllables—and even more so as I went up the hierarchy. Now, as an up-date, see the analysis of hierarchy in a poem, in Text and Tagmeme, by Pike and Pike 1943¹⁰, Chapter 2.

(d) But, in fact, sounds *smear* (as I showed in *defining* a segment in my Phonetics book (1943:107)) and must be defined in relation to nondeterminate boundaries, where necessary: ‘A *segment* [italics in original] is a sound (or lack of sound) having indefinite borders but with a center that is produced by a crest or trough of stricture during the even motion or pressure of an initiator’—. This is part of a *wave* perspective. In addition, sound units have nuclei—of phone, of syllable, of words, or stories, of basic meanings—also components of a wave view. And the hierarchy of

⁸ The quote actually appears on p. 158 of Trager’s review.

⁹ Pike, Kenneth L. 1959. “Language as Particle, Wave, and Field”. *The Texas Quarterly* 2:237–54.

¹⁰ This date appears to be an error. The full reference is Pike, Kenneth L. & Evelyn G. Pike. 1983. *Text and Tagmeme*. Norwood, N.J.: Ablex.

waves, similarly, leads from small intonation contours with their nuclei, up to large ones—large enough to accommodate Jones' Tune II, or Halliday's materials, etc.¹¹

(e) But this, also, is not enough. I mentioned, above, the need for a SYSTEM of intonation English contours and meanings, with a suggested one for nuclear contours, displayed in the chart referred to—but seeing things //p. 6// in such a way is a *field* perspective, with its background ready to be drawn on for communicative purposes. And hierarchies, also, can be studied in relation to field structures.

(f) Is it contradictory to use three perspectives? It is no more paradoxical than (it seems to me, as a nonphysicist) to be in physics (from which I borrowed the terms). We MUST be able to live intellectually in n-dimensional mental space, or give up all but an ultimate *false reductionism* to bits pretending to be in isolation but which in fact are integrated into larger linear, wave, and field structures. There is no need to reject the sets of sets of small substitutable contours, merely to leave room for large-scale elongated intonational relevant meaningful curves, which in their turn can be seen as linear particles, structured as waves, immersed in fields of contrast in hierarchical positions.

(g) I have in my recent thinking been using the term paradigmatic perspective to indicate focus on the sets of replaceable parts in a particular position, and the term syntagmatic to refer to the study of or focus on the relation of one intonation unit to others in sequence, or to parts of one unit in relations to other parts of that unit. (More recently, I have noticed that Crystal [1969]¹² 1976:197, says that 'Intonational features ... are not as easy to delimit and organise into systems, syntagmatically or paradigmatically, as phonemes.') And I raise the question—which you might have an answer for—Is my 1945 material heavily focussed paradigmatically, and Bolinger's of 1986¹³ syntagmatically? And, if so, how get the two neatly combined without losing contributions of either one? And how handle both, without losing voice quality and related items features? And how close does Pike and Pike Text and Tagmeme, Chapter 2, come to doing that?

(h) Nor is this all. For *segmental* hierarchical phonological material, note (for example) poetic rime (see Pike and Pike, Text and Tagmeme, Chapter 2); for the intonational, *suprasegmental* components of the same marked poem there; for the *subsegmental voice quality*, see the same poem. Life is complex. To reduce it in order to be "scientific" to the limits of Trager is to lose, eventually, our *ability to live* with the theories we teach.

(i) Yet, in my view, there is still more needed: One needs a theory with *slot*, *class*, *role*, and *cohesion* (or their equivalent) for each unit, on each level, of each hierarchy and each subhierarchy. But enough, for now—see Text and Tagmeme for all of this symbolized for a poem.

(7) And the use of the term *autosegmentation*, to which you refer, was begun in Africa by Goldsmith,¹⁴ I think—and I have published on *such wave-like fusions* long before that. See, for example, my morpheme wave fusion in Grammar as Wave, Monograph 20, Georgetown University Institute of Languages and Linguistics,

¹¹ The references here are to Jones, Daniel. 1909. *Intonation curves*. Leipzig & Berlin: B. G. Teubner, and Halliday, Michael A. K. 1967. *Intonation and Grammar in British English*. The Hague: Mouton.

¹² Crystal, David. 1969. *Prosodic Systems and Intonation in English*. Cambridge: Cambridge University Press.

¹³ Bolinger, Dwight L. 1986. *Intonation and its Parts: Melody in spoken English*. Stanford, California: Stanford University Press.

¹⁴ Goldsmith, John A. 1976. *Autosegmental Phonology*. Ph.D. dissertation, Cambridge, Mass.: MIT.

1967:1-14, reprinted 1972 in K L Pike Selected Writings (edited by Ruth Brend pp. 231-41). I have had a recent exchange of correspondence with Goldsmith, at his initiative, and find that he is //p. 7// referring to a good bit of my material from *Tone Languages*... All this new development is FUN—and should be encouraged.

(8) By the way, after I was well into this long letter, I felt uncomfortable. I could not confirm or refute the claim of Trager and Smith (Outline of English Structure 1951:41) that ‘Extensive testing of spoken English material has convinced us of the correctness of the *independent* [italics added] conclusions of Pike and Wells that there are four pitch phonemes in English’. So I took the liberty of telephoning Wells, in Yale (I have known him for some time) to ask him if he could clarify the situation—that I had no data as to when or how he had gotten started. He offered to write you a note (I will send him a copy of this letter and urge him to do so)—but (if I understood him correctly) he did feel that his material had been done independently of mine.

Well, this is a lot of words. Keep on having fun. I will send a copy also to Bolinger, so that he will know what I have said, and can correct any bits he sees where I have miscued, or continue to be out of date. (After all, forty-plus years is a lot of time to catch up on!)

....But one moment—an anecdote which might interest you: In 1951 I deviated from a trip to Paris in order to stop in and see Abercrombie. He and McIntosh met with me.¹⁵ In a few moments I was astonished! I said something like this (they may remember it differently, of course): “I am incredulous—I have read Jones, and was sure that your intonation [following his] would be very different from mine—but I find it to have the same kinds of structures!” They smiled at each other a bit, and one of them said something like this: “We used to say that Jones’ intonation was what he taught the foreign students, but not the way we spoke.” ... And later brief work made me believe that we had the same structure, but with different frequencies of usage, and somewhat different context (hence a bit different contextually modified meanings).

(9) It still seems strange that I have not gotten to where I felt comfortable comparing the work of Bolinger with mine. Perhaps he can help on that. And I have not yet studied adequately his recent 1986 book which is in front of me right now—nor the 1986 book by R. Gunter,¹⁶ with its cassette tape; nor even Crystal of [1969] 1976. But since I am committed to write the article requested by the USSR, I hope to try to get into these without drowning.

Oh yes, you probably have already seen an important new book by Paul Tench ‘The Roles of Intonation in English Discourse,’ a dissertation of 1987 from Wales, UWIST, which just reached me. It deals with intonation in syntactic roles, informational roles, textual organization, communicative functions, expression of attitudes, and stylistic differences. He also emphasizes hierarchy (pp. 263-71)—and see his earlier 1976 ‘Double ranks in a phonological hierarchy’, *Journal of Linguistics* 12:1-20. You might also be //p. 8// interested in the article by Howard Martin and K Pike 1975, ‘Analysis of the vocal performance of a poem’ in *Language and Style* 7:209-18—where iconic pitch is part of the time in focus; that is a further important topic!

¹⁵ David Abercrombie (1909–1992) was Professor of Phonetics and Angus McIntosh (1914–2005) was Forbes Professor of English Language, both at the University of Edinburgh.

¹⁶ The correct reference is Gunter, Richard. 1987. *A Primer of American Intonation*. Columbia, S.C.: Ibis.

If you have suggestions about some phases which I ought not to overlook in my next thrust in this direction, I would appreciate your comments.

Yours cordially,

[signed Kenneth L. Pike]

Kenneth L. Pike

cc: Dwight Bolinger, 2718 Ramona St., Palo Alto, CA 94304
Rulon Wells, 79 Dessa Drive, Hamden, CT 06517; Tel.: 203\248-8800

POSTSCRIPT—MAR. 28, 1989. There was a delay of several days while I was getting this material together.¹⁷ Meanwhile, this morning, a surprise—I got back proofs on a note of mine being published by Koerner in HL XVI:1/2,¹⁸ containing my contribution to the Bloomfield symposium at the LSA meeting in San Francisco 28 Dec. 1987. In it, I had included Bloomfield's letter to me about my intonation. I quote my comment, plus the letter. (I had forgotten that I had included in that brief article there, so did not check it out for you!):

“...The result was a preliminary volume on pronunciation (Pike 1942) which led to the book on intonation (Pike 1945). I had shown Bloomfield some of the early (1942) intonation work, and received (in a letter 27 Jan. 1943) a strong encouragement from him:

“The book is beautiful & is the first thing on intonation that I have read with any interest or profit. It seems to me to constitute a tremendous advance in phonetics. Needless to say, I am eager to get [the] book on tone lgs. & printed dissertation [on phonetics, later published that same year 1943—he was on my doctoral committee]. You are adding to human knowledge in this field—and especially in the matters of pitch and of intonation, hitherto practically unknown—and adding it at a tremendous rate of speed. I hope you will get every encouragement and facility possible.”

‘(But, sad to say, when in Bloch's office, with me present, Bloomfield urged Bloch to publish the material on intonation in the Language Monograph series; he refused....’]

Note, carefully, the date—Jan. 1943—and that I think this was when Bloomfield, Bloch, and perhaps Wells were colleagues at Yale together—I am fuzzy on this last point.

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¹⁷ Pike enclosed photocopies of several of his papers with his letter.

¹⁸ See Pike, “Recollections of Bloomfield”. *Historiographia Linguistica* 16:1/2.217-223 (1989).

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