

# **PHONETICS: Theory and Application to Speech Improvement**

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## PREFACE

Although it might prove difficult to find his counterpart in real life Prof. Henry Higgins, the phonetician in Shaw's *Pygmalion*, at least illustrates in dramatic form the simple truth that better speech is beyond no one. We profess no particular desire to emulate the professor by transforming the Eliza Doolittles of the world, and we certainly deny belonging to the "How now brown cow?" school of speech improvement.

We have attempted, however, to offer some assistance to a considerable and varied group of persons who are concerned in one way or another with what may be called the *form* of speech. These include the English-speaking student—in or out of school—who wishes to speak his native language acceptably, and thus effectively. Next are those who are learning English as a new language and need to become familiar with its patterns. We have had in mind also the speech therapist or teacher, for whom a thorough knowledge of the speech sounds and their dynamics is absolutely essential, and any others who may have reason to inquire into the details of English speech. Finally, it would be gratifying to think that there may be some who would like to know about this aspect of their language as a matter of general culture.

The whole premise of this book is that the acquisition of accurate and effective speech—or the teaching thereof—depends first upon understanding certain principles of speech form and next upon applying them intelligently in learning or teaching the oral use of language. The surest road to effective speech lies in this direction, since the acquisition of good speech involves a good deal more than vocal drill and exercise.

A word of caution: throughout the process of speech improvement one *must* keep a sense of proportion; there is no single standard of correctness that can be applied, as we shall presently explain. Furthermore, good speech is never to be thought of as a kind of superficial gloss, applied to make the surface shine. It cannot make one a different kind of person. Skill in the mechanics of speech can, however, help one avoid mannerisms

and inadequacies of pronunciation or articulation which might stand between the true personality and its full expression. Good speech form naturally can never substitute for *content*; it is an elementary principle that form complements content and makes it effective.

More specifically, the application of phonetics to speech improvement involves a careful study of the sounds of English—their production and the ways in which they change in connected speech—and an understanding of the characteristics of speaking—stress, intonation, and other aspects which will be discussed in due course. As a method, phonetics leads the student to a more nearly accurate perception of speech patterns—the speech sounds individually and in context. As he becomes sophisticated phonetically, he will find himself better able to recognize acceptable speech patterns as he hears them. He is then in a better position to become perceptive about his own speech—a basic requirement in the development of expressive skills.

Although the potential value of such an approach to speech improvement seems to be generally accepted, there has not been an entirely satisfactory text or manual to apply phonetic theory and method, at an appropriate level, to speech improvement. Consequently the gap between the academic and the practical has appeared wide. This is not to find fault with the academic phonetician; he may legitimately and profitably be occupied entirely with the scholarly study of spoken language. However, even those who might wish to bridge theory and practice have found no way to do so. In this text we have at least made an earnest attempt to achieve this goal, believing that the effort is thoroughly worthwhile.

Among those persons who have managed only a bowing acquaintance with phonetics there is some complaint that the whole subject has been made much too complicated and needlessly detailed for anyone whose interests lie more in speaking well than in academic matters. The accusation that a study of phonetic theory is an unnecessarily long and difficult route to speech improvement is quite unfounded, as we hope to demonstrate; it is, instead, the most direct and efficient approach. The charge that phonetic theory has been made unduly obscure may have some evidence for its support. In studying what purport to be elementary discussions of phonetics, one often gets the feeling that they have been written with the assumption that the reader already knows a great deal about the subject. This error also we try earnestly to avoid. At the same time, it is our purpose to present what seems to be sound theory and adequate basic information, including even some reference to research findings. Along with this is an introduction to terminology and principles which should prepare the student for further excursions into phonetic literature, if he finds the subject interesting.

It seems obvious that such a book as this will be of greatest use to the

student if he also enjoys the guidance of a skilled teacher. No one can describe the sound of speech accurately by writing about it; speech is something that must be heard, so that written descriptions are not fully meaningful unless they can be supplemented by spoken examples provided by an informed and resourceful instructor.

Nevertheless, we have tried, in so far as possible, to make this text a "do it yourself" book. We have hoped to accomplish this by presenting understandable theory along with liberal exercise materials. No apology is made for this attempt, nor does it seem to us that any supposed demands of scholarship make such an apology necessary. We frankly should like to feel that a student who reads this book and follows its counsel can, with no other help, become a better and more effective speaker. Of course we recognize the practical impossibility of completely achieving such a goal, but it seems to us that this is the manner in which any textbook should be written.

A bibliography has been supplied for the more serious student who wishes to pursue the study of phonetics further, because of an interest in such subjects as speech therapy, experimental phonetics, or linguistics. In this connection, a comment should be made on the system used in this text to record speech. There are at present—and doubtless there always will be—differing schools of thought about the best way to make basic linguistic analyses and about the vocabulary and phonetic symbols to employ in facilitating such study. Many of the differences are superficial, to be sure, but there are also some rather fundamental conflicts on theory.

One of two major schools is represented by those who follow the more traditional, or at least older, type of analysis embodied in the alphabet of the International Phonetic Association. The other, a more recent movement, employs a somewhat different system of notation and is based on some divergent ideas about the nature of speech sounds, individually and in context. An excellent reference in this connection is the book by Trager and Smith.<sup>(36)</sup>\* A second is a comprehensive text on descriptive linguistics by Gleason,<sup>(10)</sup> which contains a convenient comparison of various methods of recording speech in reasonably common use.

An elaborate discussion of these schools of thought would scarcely be germane to the purpose of this text, but we should like the reader to be aware that they exist and that, at least for some purposes, the system of notation used by Trager and Smith and others has certain advantages over the IPA method. We have chosen to retain the general pattern of analysis imposed by the IPA for several reasons. First, it appears to be better adapted for a simplified treatment, particularly for those whose native language is English, or for those who have already learned English in the traditional way. Second, the IPA notation conforms to the usage

\* Superior numbers refer to the references at the end of the book.

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and to the symbol systems which are most widely used in phonetic literature. Articulatory and acoustic phonetics employ the IPA method almost exclusively. Finally, there is the very important practical advantage growing out of the fact that what is perhaps the best and most authoritative American pronouncing dictionary, that of Kenyon and Knott,<sup>(17)</sup> is based on the IPA symbols.

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*James Carrell*  
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TABLE 1. PHONEMES OF AMERICAN SPEECH

Vowels			
Front vowels		Back vowels	
SYMBOL	KEY	SYMBOL	KEY
[i]	heed [hid]	[u]	who'd [hud]
[ɪ]	hid [hɪd]	[ʊ]	hood [hʊd]
[e]	hayed [hed]	[o]	hoed [hod]
[ɛ]	head [hed]	[ɔ]	hawed [hɔd]
[æ]	had [hæd]	[ɑ]	hod [had]
Central vowels		Diphthongs†	
[ɜ·ə]*	hurt [hɜt]	[aɪ]	file [faɪ]
[ɪ]	hut [hʌt]	[aʊ]	fowl [faʊ]
[ɝ·ə]*	under [ʌndɝ]	[ɔɪ]	foil [fɔɪ]
[ə]	about [əbaʊt]	[ju]	fuel [fju]
Consonants			
Stops		Fricatives	
[p]	pen [pen]	[f]	few [fju]
[b]	Ben [ben]	[v]	view [vju]
[t]	ten [ten]	[θ]	thigh [θaɪ]
[d]	den [den]	[ð]	thy [ðaɪ]
[k]	Kay [ke]	[h]	hay [he]
[g]	gay [ge]	[s]	say [se]
[tʃ]	chew [tʃu]	[ʃ]	shay [ʃe]
[dʒ]	Jew [dʒu]	[z]	bays [bez]
		[ʒ]	beige [beʒ]
Nasals and lateral		Glides	
[m]	some [sʌm]	[w]	way [we]
[n]	sun [sʌn]	[hw]	why [hwe]
[ŋ]	sung [sʌŋ]	[j]	yea [je]
[l]	lay [le]	[r]	ray [re]

\* [ɜ] and [ɝ] are the “*r*-colored” vowels. [ə] and [ə] are the pronunciations typical of *r* vowels in Eastern, Southern, and English speech.

† Does not include the “nondistinctive” and centering diphthongs.

TABLE 2. OTHER SYMBOLS OF THE INTERNATIONAL PHONETIC ALPHABET

Vowels			
SYMBOL	APPROXIMATE DESCRIPTION	SYMBOL	APPROXIMATE DESCRIPTION
[y]	Lip rounded [i]	[ɒ]	Lip rounded [ɑ]
[Y]	Lip rounded [ɪ]	[ɤ]	Unrounded [o]
[ɛ̃]	"Dull" centralized [ɪ]	[ʊ]	Unrounded [u]
[ø]	Lip rounded [e]	[i̥]	High-central, unrounded, between [i] and [u]
[œ]	Lip rounded [ɛ]	[ʊ̃]	Same, lip rounded
[a]	Unrounded, between [æ] and [ɑ]		
Consonants			
Stop consonants		Fricatives	
SYMBOL*	APPROXIMATE DESCRIPTION	SYMBOL	APPROXIMATE DESCRIPTION
[q][G]	Postvelar or uvular	[ħ]	Pharyngeal
[c][J]	Palatal	[χ]	Postvelar (uvular)
[ʔ]	Glottal	[ʁ]	Velar
Intermittent stops (Trills)		[ç]	Palatal
[R]	Uvular trill	[ɕ]	Alveolopalatal (prepalatal)
[ɾ]	Single tap <i>r</i>	[ɬ]	Lateral (lateral lisp)
[ɹ]	Alveolar trill†	[ɸ]	Bilabial
Nasals		[ɦ]	Glottal (voiced [h])
[ɲ]	Palatal	Glides	
[N]	Uvular	[v]	Labiodental
[ɱ]	Labiodental	[ɥ]	Palatal
Lateral			
[ɭ]	Palatal		

\* First column voiceless, second column voiced.

† IPA symbol is [r], used in this text for the glide rather than for the trilled *r*.



TABLE 3. PROSODIC AND MODIFYING SYMBOLS

Symbols for Prosodic Features		
Symbol	Description	Example
[ <sup>ˈ</sup> ]	Primary stress	[ <sup>ˈ</sup> tɛlə, fən]
[ <sub>ˈ</sub> ]	Secondary stress	[ <sub>ˈ</sub> tɛlə, fən]
[.]	Syllabic consonant	Especially [l̩] [m̩] [n̩]
[1]	Low pitch level	
[2]	Medium pitch level	
[3]	High pitch level	
[4]	Very high pitch level	[ <sup>1</sup> ɪts ən ə <sup>4</sup> stɑːn̩ <sup>2</sup> ɪŋ <sup>3</sup> θɪŋ]
[↗]	Upward inflection	[wɛɪ↗]
[→]	Level inflection	[wɛl nau→]
[↘]	Downward inflection	[go hom↘]
[ː]	Half-long	[næt bæːd]
[ː]	Long	[oː hi wɔːz]
[ ]	Short pause	[wɛl   aɪ dɒnt nɔː]
[  ]	Long pause	[dɒnt    næt hɪr]
[+]	Open juncture	[dʒæk <sup>+</sup> kəld]

## Articulatory Modifiers

Symbol	Description	Example
[~]	Nasal resonance	[sĩŋ θrũ ðĩ nōz]
[ː]	Voiced, or weak and unaspirated	[bɑːtʃ ɪz beːtʃ]
[ː]	Voiceless (breathed)	[zæːd] is about like [sæt]
[ʰ]	Aspirated (fricative release)	[pʰ ɪpl]
[ʷ]	Labialization (lip rounding)	[ræbɪt] is like [wæbɪt]
[n̪]	Dentalization (linguadental rather than lingua-alveolar)	[t̪ɪm]
[ʲ]	Palatalization (similar to retroflexion)	[ʒu]
[ɻ]	Retroflexed (palatizec.)	[ɻ] [n̪] [ɻ] [ɻ] [ɻ] [ɻ]
[ɹ]	Raised tongue	[ɹ] is like [i]
[ɹ]	Lowered tongue	[ɹ] is like [ɪ]
[ɹ]	Fronted tongue	[a-] is like [æ]
[ɹ]	Retracted tongue	[æ-] is like [a]
[ː]	Centralized vowel	[i] is like [ɪ]
[ɔ̠]	Lips rounded	[ɑ̠] is like [ʊ]
[ɔ̠]	Lips spread	[nɔ̠] is like [ɑ]
[iː]	Example of vowel modifier	[sɪtiː]
[fː]	Example of consonant modifier	[fːæn] is like [vːæn]
[ː]	Tie mark to indicate diphthong or affricate	[dʒɔ̠m]
[ː]	Unreleased	[hæt̪-taɪm]

TABLE 4. COMPARATIVE CHART OF PHONETIC ALPHABETS

IPA	Webster's New Collegiate	Webster's New World	American College	NBC Handbook
i	ē	ē	ē	ee
ɪ	ɪ	ɪ	ɪ	i
e	ā	ā	ā	ay
ɛ	ē	é	ē	ai e
æ	ā	a	ā	a
ɑ	ō	ā o	ā	ah
o	ô	ô	ô	aw
u	ū	ū	ū	oh
ʊ	oo	oo	oo	oo
u	oo	oo	oo	oo:
ʌ	ū	u	ū	uh
ɜ	ūr	ūr	ūr	er
ə	(italics)	ə	ə	uh
ɝ	ēr	ēr	ər	er
aɪ	ɪ	ɪ	ɪ	igh
ɔɪ	oi	oi	oi	oi
ju	ū	ū	ū	yoo:
aʊ	ou	ou	ou	ow
p	p	p	p	p
t	t	t	t	t
b	b	b	b	b
d	d	d	d	d
k	k	k	k	k
g	g	g	g	g
tʃ	ch tʃ	ch	ch	ch
dʒ	j dʒ	j	j	j
f	f	f	f	f
v	v	v	v	v
θ	th	th	th	th
ð	th	th	th	th:
s	s	s	s	s
z	z	z	z	z
ʃ	sh	sh	sh	sh
ʒ	zh	zh	zh	zh
h	h	h	h	h
m	m	m	m	m
n	n	n	n	n
ŋ	ng	ŋ	ng	ng
l	l	l	l	l
w	w	w	w	w
hw	hw	hw	hw	hw
j	y	y	y	y
r	r	r	r	r

*Note:* Because of the different concepts of linguistic structure, dictionary pronunciation systems are not strictly comparable on a phoneme-to-phoneme basis. For this reason not all vowel symbols used by the dictionaries represented here are given—only those which most closely compare with the IPA symbols for the vowels of stressed syllables. For example, even when they are used by the dictionary in question, symbols for “half-long” or “*r*-diphthong” vowels are not included.

1. *Webster's New Collegiate Dictionary* (based on *Webster's New International Dictionary*), 2d ed., Springfield, Mass.: G. & C. Merriam Company, 1956.
2. *Webster's New World Dictionary of the American Language*, college edition, Cleveland: World Publishing Company, 1954.
3. *The American College Dictionary*. C. L. Barnhart (ed.), text edition, New York: Harper & Bros., 1948.
4. *NBC Handbook of Pronunciation*, compiled by J. F. Bender, 2d ed., New York: Thomas Y. Crowell Company, 1951.

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## PHONETICS AND SPEECH IMPROVEMENT

The ability to speak well is an attribute that has both utility and beauty. To be sure, *what* one says is more important than *how* he says it; yet it is evident that there can be no fully effective communication through spoken language unless the manner of speaking gives force and impact to the thoughts and feelings that are to be conveyed. Good speech is not, then, a cloak for superficiality. It is, instead, the rightful and natural mark of the educated, cultured, and intellectually vigorous person. The acquisition of speaking skills, through whatever study and practice are necessary, therefore merits the careful and conscientious attention of serious students.

A primary objective of this book is to assist such students in developing whatever level of skill they aspire to in the use of speech form. It would be naïve to suppose that good speech can somehow come about without effort or that it can be achieved simply through vocal drill and exercise, necessary as these may be in an incidental way. Rather, the approach must be through a study of the speaking process and the various aspects of speech form, including a consideration of such matters as standards of correctness or acceptability. Once these are fully understood, the student can work intelligently toward the control of his own speech patterns.

The basic information needed for improvement of speech form is contained in the general body of knowledge called *phonetics*. This may be defined as the science of speech sounds as elements of language and the application of this science to the understanding and speaking of languages. Phonetics bears a close relationship to *linguistics*, which embraces the study of language in the broadest sense. *Experimental phonetics* employs objective laboratory techniques in the analysis of spoken language. *Articulatory*, or *physiological*, *phonetics* is concerned particularly with the formation of speech sounds and with the dynamics of speaking. When the

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products of these specialized fields of study are synthesized in such a way that they can be used in the development of acceptable and effective speech, this area of study is one facet of *applied phonetics*. It is from the point of view of this discipline that the material in this book is selected and organized.

We shall be concerned for the most part with only one aspect of the total speaking process: what has been called the *form* of speech. As contrasted to *content*, the term *form* refers to the sounds of the language and to the phenomena of spoken language which occur when these sounds are combined into meaningful words, phrases, and sentences. The inquiry into the characteristics of connected speech will lead us to a consideration of the mechanics and dynamics of syllable, word, and sentence formation and into such other pertinent matters as stress, intonation, and standards of correctness in pronunciation.

Although anyone who embarks on a speech improvement program—or who wishes to teach others—must have a theoretical knowledge of what he is setting out to do and a clear idea of where he wishes to go, extensive practice of various kinds obviously will be necessary. In some respects, learning to speak well is not unlike learning to play a musical instrument. Anyone who is fortunate enough to possess certain unusual skills and aptitudes may possibly perform creditably without the tedium—if it is tedium—of extensive study of music theory or long hours of exercise. More often, however, the musician must learn the principles of his art and devote himself to intelligent practice.

The same reasoning applies to the learning of language skills. We do not expect to acquire legible handwriting without a study of the way in which letters are formed or a good deal of practice in penmanship. Fortunately, many persons grow up in an environment where good speech is the rule and quite unconsciously follow the patterns set for them. Even so, most of us need to invest some time and interest in the conscious effort to speak well, just as we must learn to use language in reading and writing. One is fortunate if the study of speech was part of his early education, but if it was not, he can take comfort in the fact that it is never too late.

Thus, along with the discussion of *phonetic theory* in relation to the effective use of speech form, great stress will be laid on the importance of the *phonetic method*. It is absolutely essential that one learn to *hear* and *analyze* the full details of spoken language so that he can recognize with certainty the exact characteristics of pronunciation, stress, intonation, and the other attributes of speech. Only on this basis can the speaker actually become aware of speech and learn to control consciously, as he must, his own patterns of speaking. These two aspects of our study—*theory* and *method*—are complementary; each facilitates the other, and

together they constitute the foundation for an intelligent and scholarly program of speech improvement.

After one has become sophisticated about the kind of thing for which he should listen, the ability to hear speech analytically calls for no skill or ability which the average person cannot develop. The problem of using the phonetic method is principally one of learning to direct attention perceptively toward the *sound* of speech rather than to focus primarily on word meanings. Practice is necessary, of course, particularly in becoming critically aware of one's own patterns of speech. We shall return to this topic in a later section, with specific suggestions on developing skill in speech analysis, and to an explanation of *phonetic transcription*. Transcribing speech is an excellent way to develop the necessary listening skills, and it has other important uses as well.

### CHARACTERISTICS OF GOOD SPEECH FORM

Let us turn now to a question that is basic for any program of speech improvement: What are the characteristics of an acceptable and effective use of speech form? Modern teachers for the most part try to avoid the sort of schoolmastering that prevails when correct speech form is taught on the basis of rigid rules. Instead, the approach is a more reasonable one, based on the idea that speech can be considered good if it communicates fully, which means, among other things, that it must conform to an accepted usage. Since there is no single way of talking that can be considered "correct" in the schoolmaster's sense, we shall often use the term *standard* to describe speech that conforms to an acceptable usage and *substandard* for speech that does not.

From the practical point of view, however, anyone who undertakes to improve his use of spoken language is forced to formulate an operational definition of good speech, no matter how aware he may be of the fact that there are many acceptable standards. If it is true, as Emerson suggests, that every man might well be occupied in writing his own bible, then it is equally true that he should be formulating, in an intelligent way, his own standard of speech. He can do this best if he takes a fairly broad look at some of the linguistic, historical, and phonetic considerations which are involved in speech standards.

Since this text has speech improvement as an ultimate goal, the authors have felt it necessary to make recommendations from time to time about what they consider desirable speech traits. Many points in the later discussion are based frankly on the authors' own ideas about good speech form. At the same time, the intention is to make the student aware of the problems of speech standards, the reasons why these problems have arisen, and the possible ways in which they may be resolved. Nowhere

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in the discussion of standards of speech or pronunciation is there any effort to enforce a particular set of rules on what is correct and what is not.

**Intelligibility.** The most elementary requisite of good speech form—and there is little disagreement about this—is *intelligibility*. To be clearly understood, the speaker's *articulation*, or formation of the speech sounds, must be sufficiently accurate to make his words easily distinguishable. If they are not spoken in this way, he simply will not communicate adequately. He may likewise give the impression that he is careless or uneducated or that he possesses some undesirable trait of personality. Judgments about an individual based on the way he speaks may on occasion prove wrong, of course, but this does not alter the fact that they will be made.

Articulation which is adequate for a minimum level of understanding should not be difficult for the native speaker to achieve, since the only requirement is that the movements of the articulators be sufficiently vigorous and precise to give the speech sounds the characteristics they should have. In addition, of course, the individual speech sounds must be properly blended into syllables and meaningful words, which involves an understanding not only of the individual sounds but also of the ways these sounds change when they are placed in the context of speech.

Unfortunately many persons fail at this elementary level. The reasons may be numerous, but they should never prove insurmountable for the physically normal speaker. The student must become aware of the need for distinct articulation, develop the capacity for perceptive listening so that he can recognize correctly articulated speech, make an intelligent comparison of this standard with his own speech form, and be willing to monitor consciously his own articulation. Practice will naturally be needed. Typical errors and the ways in which they can be dealt with are discussed in a later chapter. The help of a speech therapist should be required by only the relatively few persons whose difficulties arise from some motor disability, a defect in mouth structure, or some unusual learning problem.

**Pronunciation.** A second requisite of good speech form is pronunciation which conforms to an acceptable standard. In a general way, the term *pronunciation* refers to the choice of sounds used in forming words, whereas *articulation* is the process of forming the sounds and syllables. A word is *mispronounced* if it contains one or more wrong sounds or if the correct word pattern is distorted by adding, omitting, or transposing sounds (or by improper use of stress). The word is *misarticulated*, on the other hand, if the sounds it contains are not spoken with sufficient accuracy and precision. These two factors—the choice of sounds and their articulation—can, of course, be interrelated in many ways.

Before attempting to develop his own pronunciation practices, the



student should know, first of all, that there are three principal speech regions in the United States. These usually are designated as *Eastern American* (EA), *Southern American* (SA), and *General American* (GA). The geographical boundaries of these areas are not clean-cut, nor have they been exactly located, despite the large number of systematic studies of regional dialect. In general, however, Eastern American is heard in the New England states, New York City, and in those portions of Canada which lie east of the Province of Quebec. Southern American is heard in the states of the old Southern Confederacy, with Kentucky added but with west and central Texas excluded. In the remaining states General American is most commonly heard among the natives. In terms of population GA is used by the largest number of persons in the United States and EA by the fewest.

This general description of the three speech areas is an oversimplification which would be seriously misleading for anyone with an academic interest in American dialects, although it will suffice for our purposes. Not only do the boundaries overlap, but there are numerous interesting subregional dialects; it is therefore impossible to generalize beyond a certain point about the speech traits of any one region. Extensive studies on this subject have been in progress for many years, notably those involved in the compilation of the *Linguistic Atlas of the United States and Canada*, and they have produced a wealth of data. It is not profitable to go into these matters in detail in this text, but anyone interested in exploring this topic further would find Wise's *Applied Phonetics*<sup>(39)</sup>\* an excellent starting point.

Up to this point we have not gone far enough into phonetic notation to make it possible to discuss easily the nature of the typical differences among the three speech regions. There are, however, some common misconceptions about them. Actually, the really conspicuous regional differences among educated speakers from each of these three areas are relatively few; most of the more obvious distinguishing features center around the way the *r* sound is handled and upon the pronunciation of the *a* vowels. Careful analysis, of course, will reveal a number of fine points of difference, but these are not apparent to the average listener. Subtle nuances in stress and intonation also play a role in indicating the speaker's linguistic origins.

In most cases the person who is criticized for dialect speech is either using very narrow localisms or is employing obtrusive pronunciations which might be considered substandard even in his own area. For instance, one who seems to say "cain't" for "can't," "po' boy" for "poor boy," "sho' nuff" for "sure enough," or "pernt" for "point" is certainly not talking in conformity with the usages of educated speakers in any of the

\* Superior numbers refer to the references at the end of the book.