

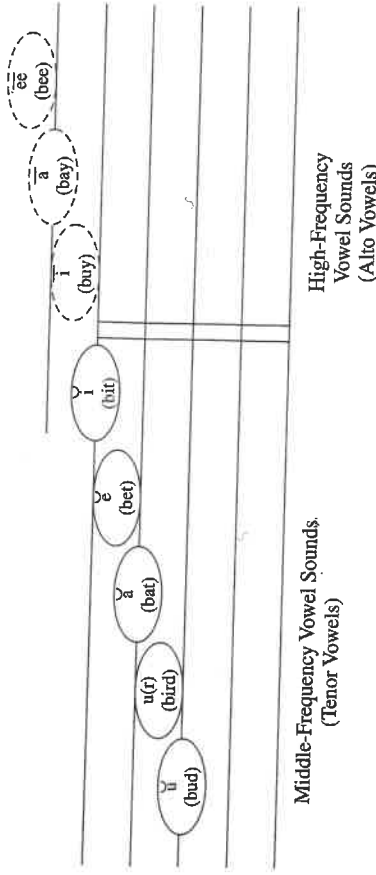
raising our tongue, rounding our lips, and the like, reshaping the instrument it flows through. How we manage so complicated a process would astound us if we thought about it.

Our feats of hearing are equally incredible. We follow as many as twenty distinct sounds a second; we notice sounds that fade into nothingness in a few thousandths of a second; and we do so while turning this complicated acoustic input into electrochemical nerve impulses that the brain can process. The most complicated sound patterns a poet ever uses are as nothing compared to the patterns we handle habitually.

Vowels are in a way like musical notes; we can set up a vowel scale (rather like a musical scale) based on the frequencies that the sounds have in themselves. Sound, as we know, travels in waves. Since it travels at constant speed, the shorter the waves, the more per second—the higher, that is, the frequency of the sound. Shortwave sounds are high-frequency sounds, shrill sounds, like the *ee* of “wheel!” The longer the waves, the fewer per second, and the slower and deeper the sound seems to be. (We know that if an old 78 rpm record is slowed down to the 33½ (LP) speed, the sound will get slower and deeper.) The *oo* of “moon” is a low-frequency sound.

A difficulty we run into in making up a vowel scale is that vowels are not notes, but chords made up of tones and overtones from the resonating system of throat, mouth, and head. Some of our fifteen sounds, the diphthongs, are two chords sounded in sequence. The *i* sound of “good-by” is a run-together *áh-ee*. Several other sounds are also vowels in motion—“glides” from one sound into another. Our scale, though it would not provide a basis for laboratory experiment, is on the whole accurate for American speech, and it serves well enough for the reading of poetry.

The “upness” and “downness” of vowel sounds affect us physically in different ways. The *ee* sound, at the top of the scale, comes in a pattern of waves that could be diagramed like this:



in contrast to the wave pattern of the *oo* sound, at the bottom of the scale:



The high-frequency *ee* is busier, gives the ear more to process. Its greater activity suggests greater vitality, speed, excitement than the slower-moving, more sluggish waves of the *oo*.

Few categories in our experience are richer in emotional suggestion than upness and downness. We associate being “up” or “high” with an increase in vitality, being “down” or “low” with a lessening of it. Our heart “sinks” when we feel grief, the physical effect of which Charles Darwin describes as follows: “The muscles [become] flaccid; the eyelids droop; the head hangs on the contracted chest; the lips, cheeks, and lower jaw all sink downward from their own weight.”* The last phrase explains why downness is bad: When we give up or lose strength, gravitation takes over. All growth, aspiration, striving is an upward thing, almost against the nature of matter itself.

*Charles Darwin, *The Expression of the Emotions in Man and Animals* (Chicago: University of Chicago Press, 1965), p. 167.