

Rhythm and Meaning in Poetry

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I begin by sketching some features of meaning and rhythm, to provide the background for what I have to say about their relation to poetry. In Section I, I extend the ordinary sense of meaning to a much wider one than is customary in philosophy, if not in poetry. In Section II, I turn to rhythm, a concept not much studied in philosophy. Turning to the literature on rhythm in poetry, there is much about the accounts given by a variety of critics and poets that is not fully satisfactory. On the other hand, I have learned a lot in reading them, and I am sympathetic with the rather unsatisfactory definitions of rhythm given in relation to poetry. The nature of the problem is easy to explain. The phenomena are extraordinarily complex when studied in detail. My own effort is also quite incomplete, but will, I think, suffice for explaining the main things that I want to say in this article. In Section III, I examine four poems to illustrate distinctions made earlier, and in Section IV, I sketch a scientific analysis of how and why rhythm so enhances poetic meaning.

I. MEANING

I've recently written (Suppes forthcoming) an article expressing my own philosophical view that there are three main senses of meaning. The first and most rigorous sense is that of formal definitions in mathematics. A simple example is the definition of the binary operation of subtraction for two real numbers, in terms of the binary primitive operation of addition and the unary operation of negation:

Definition. $x - y = x + (-y)$

The second meaning is the one most familiar in the schools. The meaning of a word is to be looked up in a dictionary. This is the standard conventional concept of a dictionary definition. If these two meanings sufficed in a simple way as a complete theory of meaning, a lot of philosophical and psychological literature on meaning would have to be regarded as superfluous and irrelevant. But this is not at all the case. I may say to a friend, in a disapproving voice, "Is not the meaning of your action clear to you?" In another conversation, I may remark, "The meaning of that music never got through to me before." Or I might say, in still another context, "The real meaning of virtue in Aristotle's *Ethics* is something I am only finally beginning to understand."

Just about everyone would agree that the meaning of *meaning* used in these remarks is not that of either of the two senses described earlier, the formal and the dictionary ones. So I now sketch the third sense of meaning.

Associative meaning is the sense applicable to poetry, and many other subjects as well. So, to give another example similar to those already given, when I say, "This poem's deeper meaning has only recently become clear to me," I do not have in mind, of course, either the formal or dictionary sense of meaning. I am using the much wider sense of associative meaning, familiar to all of us, even if not so named, in ordinary conversation, and in silent private thoughts. Such associative meaning is a natural part of the mental life of all of us, and it is also part of the natural, even if more restricted, mental life of many animals—certainly the higher mammals. The point is that ordinary conversation is full of association. The reason is made evident at the beginning of Hume's *A Treatise of Human Nature* (1739/1951). He asserts that association is the engine of the mind in the way that gravity is the engine of motion in the solar system and the rest of the cosmos. Association, of course, has had its ups and downs in the last hundred and fifty years of psychology, but it has regained its rightful place of importance in modern neuroscience. Associations are an important part of human brain activity, and are the mechanism of learning in species very far down the scale of evolutionary development.

The associative network that is an essential part of our brains, but which I shall not describe in neural terms but in more standard psychological terms, is central to most of our mental activities. Clear recognition of the importance of association goes back to Aristotle, but was really made central to the theory of mind by Hobbes and even more, a little later, by Hume. It is not to the point to give even a partial history in this context, but rather to refer to the vivid and accurate mental descriptions given by Hume, as discussed in Book II, *Of the Passions*, where in many ways his theory of association receives its most original and detailed development. The wider sense of associative meaning that brings in the passions, or as we would say now, the emotions, is particularly linked in my view to the importance of rhythm in poetry, as I will try to explain a little later. The point I am making now is that when I talk about rhythm and meaning, I shall of course not be restricting myself to associative meaning that is purely cognitive in character. The really fundamental fact about association is that it is, in a very general way, utterly promiscuous in the way that it ranges afar and over many kinds of things, or more

accurately, images or mental representations. When I listen to a lecture of the most austere sort on neuroscience or possibly the history of the Aristotelian concept of form, my mind can easily wander and associate to quite unexpected images and feelings associated with these images, ordinarily not in conscious awareness, are now momentarily there, soon to fade out as I return to focusing on the content of the lecture. It is this wide-ranging sort of free association that it is especially important for my conception of what is significant about meaning in poetry.

There is one other point I want to be explicit about. I am an unabashed advocate of including mental images as part of the meaning of verbal expressions as well as other kinds of quite different experiences. Not everyone in philosophy or psychology would agree with this strong thesis about images. However, it is not only my Aristotelian instincts for the central place of form, and consequently of images, but also my scientific sense that without an isomorphism of forms that constitute images in the brain, it is difficult to see how the brain could work so smoothly in dealing with the outside world. Abstract descriptions, to replace images, as fantasized by some philosophers, are nonstarters taken at face value. Such an approach requires a radical computational theory to be set forth in detail as to how the rapid processing of perception and the interpretation of the meaning of changing scenes are understood. I am highly skeptical that such an account can be given. Mental images, for me, are central to this wider sense of associative meaning, and at least my own reading of poetry is full of such mental-image associations.

II. RHYTHM

Rhythm is found in many things, above all, in many processes. One of the main features of rhythm, in these many different contexts, is some central but only approximate notion of periodicity. And not all periodic phenomena are regarded as having rhythm; at least, I would find it slightly weird to say that the pendulum of a well-performing clock had a beautiful rhythm. The reason is that, when something is completely regular in its periodicity, it lacks the intuitive qualities we usually associate with rhythm. Also, there are many periodic phenomena that we perceive as uniform. For example, if I hear a pure sine wave, of a standard high auditory frequency, then I do not hear anything like a rhythmic sound, but a pure sound of uniform quality from one moment to the next.

The arts that almost all agree are the ones that most directly have a strong sense of rhythm are poetry, music, and dance. The ultimate source of this strong human sense of rhythm also seems generally agreed to be due to the innate rhythm of breathing and heartbeats. Other rhythmic activities that are widespread are walking and running. Rhythm is especially evident in the running, not only of humans, but of horses, dogs, and many other animals. As might be expected, and as already noted, for something so centrally human, no simple mathematical definition will work. On the other hand, the recognition of the qualitative periodic nature of rhythm is familiar in almost all cultures. This wide presence is usually said to be derived most directly from the rhythm of speech, and so vocal music—singing, that is—is also recognized as being found almost everywhere. Rhythm we all recognize

can certainly be found in bird calls and songs. The rhythm of group singing, chanting, or foot stomping are also widespread phenomena where rhythm is socially most manifest. The relationship between meter and rhythm, either in music or poetry, is longstanding. There is in fact a complicated history of controversy about their relationship. It is not essential to enter into this controversy here. It is generally accepted that traditional poetry with a strong meter is closer to music than is free verse, although even this idea can be challenged by pointing to the lack of fixed meter in much modern music.

III. FOUR EXAMPLES

Here is probably by far the most famous poem by William Blake, written in the eighteenth century. Of course I am only showing here the first two stanzas, but this is one of the most well-known poems, at least as part of my schoolboy experience. I still remember it for a very special reason I cannot help mentioning. Early in 1943, when I arrived by ship at Noumea, New Caledonia in the South Pacific, on the way to Guadalcanal and further north in the Solomon Islands, for assignment as a meteorologist in the U.S. Army Air Force, we docked in the middle of a hurricane. The decision was made to tie the ship to the dock and wait out the storm rather than going back out to sea. Over the twenty-four or thirty-six hours that we stayed on the ship, this was a much more stressful experience than any earthquake I have yet to encounter in California. But the point here is that the transient quarters assigned to us for our arrival in New Caledonia, while awaiting shipment north, were completely devastated by the hurricane. All the tents were blown down, the electricity was gone, and mud was everywhere. So it was our job to put the tents back up, to clean up and wait for the weather to improve—which it did, rather rapidly—but the electricity remained out for a number of days. In the evenings we would sit in our tents and play poker with just a few candles, too little to read by. When we got tired of cards, we would recite poems that we remembered from the past. None of us could really sing. I and some others remembered especially *Tyger! Tyger! Burning Bright* . . . After these many years, I found it amusing to look at the rhythm of this famous poem. It illustrates a point that is familiar: Rhythm is like beauty. In some cases it can be recognized by all, but adequately described by none. In my younger days as a philosopher, I was impatient with such an inability to describe something. My tolerance has grown with the years, with the realization that many, if not most things very human, are like this. In the present case, the meter is essentially four beats or stressed syllables to the line, which I have marked, plus a rhyming pattern. I take from phonology that in English, metrical structure consists mainly of stress and syllable structure. More elaborate schemes of meter include various forms of marking downbeats and their absence between stressed syllables. A good exposition is found in Carper and Attridge (2003), but in spite of their rather elaborate analysis, they do not connect it in any serious way to the much more elaborate schemes of modern phonology. For more details than anyone but a phonologist wants to read, see the *Handbook of Phonological Theory* (Goldsmith 1995).

Týger! Týger! búrning bríght
 Ín the fórests óf the níght,
 Whát immórtal hánd or éye
 Could fráme thy féarful sýmmetry?

Ín what dístant déeps or skíes
 Búrnt the fire óf thine éyes?
 Ón what wíngs dare hé aspíre?
 Whát the hánd dare séize the fíre?

Ironically, my associations now about this poem, and my incomplete memory of the associations I had in 1943, focus almost entirely on the hypnotic quality of the poem, which I attribute to the strong and obvious rhythm. Carper and Attridge rightly emphasize that this rhythm is exactly that of many familiar nursery rhymes, for example, "Twinkle, twinkle little star/ How I wonder what you are." Unconscious memories of such verses overlearned at an early age may have contributed to the pleasure of our recitation. Surely we would have been embarrassed in our early twenties to recite nursery rhymes themselves.

It is obvious that in a formal theory we can distinguish between definitions, axioms, and theorems, and we can recognize the limited nature of dictionary definition. On the other hand, there is no natural line to draw on the range or limitation of associative meanings. They seem to flow seamlessly from something very narrow and cognitive to something mainly affective and rhythmic. It is especially in this arena that any firm separation of meaning and empirical fact or feeling seems arbitrary. Even the phrase "analytic associative meanings" sounds strange. Of course, this does not imply that many distinctions cannot be made among different kinds of associative meaning.

Sometimes such associative meanings occur explicitly in a poem, rather than being left to the private unspoken world of the listener or reader. Here is an example from Wordsworth. This is his poem, "I Wandered Lonely as a Cloud," written in 1804.

I wandered lonely as a cloud
 That floats on high o'er vales and hills,
 When all at once I saw a crowd,
 A host, of golden daffodils;
 Besides the lake, beneath the trees,
 Fluttering and dancing in the breeze.

The waves beside them danced; but they
 Outdid the sparkling waves in glee;
 A poet could not but be gay,
 In such a jocund company;
 I gazed – and gazed – but little thought
 What wealth the show to me had
 brought:

Continuous as the stars that shine
 And twinkle on the milky way,
 They stretched in never-ending line
 Along the margin of a bay:
 Ten thousand saw I at a glance,
 Tossing their heads in sprightly dance.

For oft, when on my couch I lie
 In vacant or in pensive mood,
 They flash upon that inward eye
 Which is the bliss of solitude;
 And then my heart with pleasure fills,
 And dances with the daffodils.

Note especially the third line of the last stanza: "They [the daffodils] flash upon that inward eye."

The idea of flashing is a subtle and accurate way to describe how we become consciously aware of associations, which are mainly unconscious. Wordsworth's

earlier lines describing the circumstances in which such associations occur matches well a common conception of a good setting for free associations of psychological significance.

Here is a short passage near the end of James Joyce's *Finnegans Wake* (1939):

For all the bold and bad and bleary they are blamed, the seahags. No! Nor for all our wild dances in all their wild din. I can seen meself among them, allaniuvia pulchrabelled. How she was handsome, the wild Amazia, when she would seize to my other breast! And what is she weird, haughty Niluna, that she will snatch from my ownest hair! For 'tis they are the stormies. Ho hang! Hang ho! And the clash of our cries till we spring to be free.

(627)

The meaning is slippery, so a diversity of associations comes easily. But the rhythm is strong, more so than that of many poems. It is this that I remember, as was so for *Tyger! Tyger! Burning Bright*.

As a last example, which generates very personal associations for me, I quote in full a poem by English poet Stephen Romer from his recent collection *Yellow Studio* (2008). It was written during his father's terminal illness or just after his death.

An Enthusiast

Nothing quite dislodged
the early passions, they took possession
hourly, every time my father
walked the marshes, or listened in
to the 'excellent gramophone'
that 'speaks through the wireless'
in his private sitting room,
or weekly without crackle
in the Albert Hall . . .
Aetat sixteen, he decided
school was loathsome
And nothing mattered anyway
but Music, Ornithology,
a boy called Strode, and God.

Fifty years later
some hardnosed specialist
of consciousness and the genome
held forth at table, claiming
to my father's mild protestation
that Bach's St Matthew Passion
is a product of the human brain
like medicine or the washing machine.
'There is no such thing
as divine intervention'
and I pushing in
to agree, with an eagerness,
with a vanity,
I now detest and regret.

(Romer 2008, 83)

My father was not very much like Romer's, but reading such personal words started, without my first noticing it, the associative process of retrieving a host of personal memories of my own father who died many years ago (1970). The feelings aroused were momentarily intense even after so long a time. I mention here that having in hand the kind of neural explanation I give later in no way diminishes the feelings I have even now on re-reading the poem.

IV. SCIENCE AND POETRY

One of the tasks of scientific psychology has been to sort out the great varieties of association. These range from the strict conditioning of Pavlov's dogs at the sound of a bell to the free associations occurring in response to many poems. This variety is used to great effect by poets of all sorts. The words of a poem excite associations on the part of the listener or reader that are often vivid and significant, but equally idiosyncratic and private. The poet does not know at all what these will be.

My special point is that the patterns of words of poems have a feature that gives rise to what I think of as the most important psychological or neural characteristic of poetry: The rhythms of the words lock in phase with the rhythms of the brain. Or, rather to put it the other way around, the brain's processes phase-lock to a poem's rhythm; this rhythm is often not consciously noticed by the listener or reader. In the case of music, the phase-locking has, on many occasions, a very obvious behavioral manifestation, in tapping, swaying, singing, or what have you, to the rhythm of the music. Poetry is, with some exceptions, more subtle, but the rhythm is still there, and it produces something similar in the brain. (For detailed discussion of brainwave representations of words, see Suppes, Lu, and Han (1997), Suppes and Han (2000), and Suppes (2002), chap. 8.)

Two questions, closely related, can be immediately asked about what I just said. What is the evidence that the brain is deeply influenced by rhythm? And, if true, what is the reason for it? The first kind of evidence, not directly neural in nature at all, can be found in the observation of the kind of ordinary activities I have already cited. That almost all of us are capable of singing, clapping, and dancing—in the right atmosphere and with the right crowd—is undeniable. Moreover, we all have a sense of the pleasure of this, as well as of its ubiquitous nature. More subtle, but still obvious, data come as we respond to a great deal of music in a less physically vigorous way. Poetry has a similar history of such recognition, though not as universally present today in the way that music is. At a still more general level, the rhythm of speech has been recognized, analyzed, and commented upon, even prior to the Alexandrian grammarians. In fact, Aristotle notes that the rhythm of speech remains, even when the meter of poetry is not present. (In Ancient Greek, meter was not measured by stressed and unstressed syllables, but by regular beats.) Here is what Aristotle says:

Now all things are limited by number, and the number belonging to the form of diction is rhythm, of which the metres are divisions. Wherefore prose must be rhythmical, but not metrical, otherwise it will be a poem. Nor must this rhythm be rigorously carried out, but only up to a certain point.

Of the different rhythms the heroic is dignified but lacking the harmony of ordinary conversation; the iambic is the language of many, wherefore of all metres it is most used in common speech.

(Aristotle, *The Art of Rhetoric*, III, viii 2–4)

Many acute sports commentators and trainers comment upon the importance of rhythm in performing well, whether it be in basketball, tennis, or what have

you. Of course, none of these examples, familiar to all of us, mention the brain. Yet presumably none of us believe that the control of rhythm is to be found anywhere in the body, but in the brain, and possibly the spinal cord.

But the question of why the brain responds in a vigorous way to rhythmic external stimuli is a deeper and more difficult question. It is tempting to adopt Hume's strategy and declare it an *original quality*, which we can explain no further, just as we cannot explain gravity, which even Newton conceded. I may not do much better than I would by adopting Hume's approach, but there are a few things I can say that may be suggestive if not conclusive. One is biological: Rhythm is found everywhere. It is not just the stomping crowd at a popular music concert, but fireflies flashing in concert long before there were any humans to enjoy music, as were thousands of crickets chirping on summer evenings. These are just two of a colossal number of biological phenomena exhibiting rhythm, or as we sometimes say, in a more scientific direction, synchrony. Rhythm or synchrony in some form is a part of all, or almost all, animal species.

Another level, which takes us back in the direction of physics, assumes the processes that exhibit rhythm in the brain are electrical ones, or to be more precise, electromagnetic ones. I would claim, without trying to prove it here, that all the rhythms in the brain, above the level of single cells and with possibly a few chemical exceptions, are to be found in electromagnetic signaling phenomena. The most detailed way that I know how to think about this is that the associative processes of the brain are those of large collections of physical oscillators, each being made up of many individual neurons. The associations I have mentioned extensively are themselves the results of oscillator computations. More particularly, it is the phase-locking of these oscillators, dynamically coupled to each other, that is the fundamental computational mechanism of association. If so, small wonder that the brain is so congenial to associative meanings that have rhythmic expression.

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