Fugue No. 11

F Major
Well-Tempered Clavier Book II
Johann Sebastian Bach

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© 2010 Timothy A. Smith (the author)[1]
To the memory of <u>Kenneth L. Pike</u>

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To read this essay in its hypermedia format, go to the Shockwave movie at
<u>http://www2.nau.edu/tas3/wtc/ii11.html</u>.

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Subject: Fugue No. 11, *Well-Tempered Clavier*, Book II

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Meaning is a product of interactions with people and objects in our environment. Language is foundational. After introducing Ken Pike's contribution to linguistics, we'll apply his theory to this fugue as:

- wave, particle, and field
- slot, class, role, and cohesion
- the tonemic experience
- of musical meaning

Ken Pike's Contribution to Linguistics

> The only excuse a man has for writing is to write himself--to reveal
> to others the kind of world reflected in his individual mirror.
> Rémy de Gourmont
> *Le Livre des masques*

   Kenneth Pike prefaced his *Talk, Thought, and Thing,* with the following sentence: "This booklet is written for a small number of people unknown to me, who are disillusioned in a changing world." [2] The beauty of Pike is that he was

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[2] Shortly after its 1993 publication, my mother gave me a copy of Pike's *Talk, Thought, and Thing: the emic road toward conscious knowledge.* I read it then put it away. In preparation for the analysis of this fugue in 2010 I read it again, quickly realizing how substantially this little book

not disillusioned.[3] To those who knew him, Ken Pike was ever upbeat and hopeful, this in spite of tectonic intellectual and cultural shifts during his lifetime. He could maintain this outlook because he understood that language, the foundation of all meaning and human interaction, is itself in a continual state of flux: "It is not only individual words," he wrote, "which have differences of meaning; the entire semantic system is in a fluid state. Without possibility of change in meanings human communication could not perform its present functions" (*Language in Relation to Human Behavior*).[4]

Like Pike, I am writing for a small number of people unknown to me. My reader is *you*, a casual browser on the Internet, about whom there are many things that I could not possibly know. You may be in high school or retired, a student or a university professor. You may be healthy or ill, outgoing or reserved, religious or not. But one thing that I *do know* about you is that you wouldn't be reading this if you weren't interested in music--wanting to understand how it works and how it affects us so. You are also interested in meaning--especially *musical meaning*--how it is made, understood, and undergoes transformation.

Kenneth Pike believed that *all* meaning comes from the experiences of one person in relation to another. He even went so far as to say that, "Truth is person. Truth does not exist in principle, but in person."[5] Accepting Pike's

has influenced my thought in the intervening decades. Pike's ideas on the relationships of hierarchies and systems to other systems, so central to what we do in music theory, have become internalized to the point that I think of them as my own. It is possible, I suspect, that this entire *Well-Tempered Clavier* project owes its existence, in part, to Ken Pike.

[3] Pike's greatest opportunity for professional disillusionment would have been in 1975 when certain members of the American Anthropological Association accused the Summer Institute of Linguistics (of which Pike had been President since its founding in 1942) of ethnocide. Pike responded with a fifteen-page letter to the AAA's Committee on Ethics, which spent a year investigating the charge. In the following year the committee unanimously ruled in favor of SIL and against the complainants.

[4] *Language in relation to a unified theory of the structure of human behavior,* p. 623 (Janua Linguarum, series maior, 24. The Hague: Mouton). Pike began his *Unified Theory* in 1954, culminating in the 170-page "preliminary edition." In the next year he added 85 pages and, in 1960, another 146. Subsequent revisions and additions have culminated in the definitive 762-page work.

[5] *With Heart and Mind: a personal synthesis of scholarship and devotion* (1962), p. 52. Here Pike answered critics who accused him of mixing religious belief with scholarship. Pike responded by asserting that science, philosophy, reason, and logic themselves are founded on belief. If one does not *believe that reason is reasonable*, then none of these would be possible. He implies, further, that our belief in reason can't claim reason itself as proof. Because this contradicts a cardinal principle of logic--using the antecedent to confirm the consequent--any assertion that reason is reasonable because it is reasonable is infinitely tautological. While we can hold that science is reasonable, we must first acknowledge that this conviction comes of *belief*. "Fruitful discourse in science or theology requires us," Pike writes, "to believe that within the contexts of normal discourse there are some true statements. Man must, sometimes, act as if he believed it--or die" (p. 46). If we do not believe that "truth exists" is a true statement, then all scholarship is doomed to abject failure. To those who don't understand that modernity has a fundamental problem with truth, some recreational reading on deflationary theories of truth is in order (hint: truth is a construct, it doesn't actually exist). Upon his *belief* in the real existence of truth, Pike affirm his philosophy of scholarship as follows:

assumption, all meaning in music derives from interactions between actual people: the composer, the performer, and listener. In listening to this fugue, you are absorbing what J. S. Bach meant. You are weighing this against David Korevaar's interpretation of what Bach meant. In reading this essay, you are seeking to enlarge those meanings through the magnifying glass of Kenneth Pike's *tagmemic theory*, which addresses the how and why things mean anything at all.

Pike defined a *tagmeme* as "a unit in context." By implication, the unit is meaningful *precisely because of its context*, with out-of-context entities losing their full range of meaning rather quickly. The tagmeme is therefore *emic*, a word of Pike's invention denoting anything with meaning. By contrast, he used *etic* to describe meaningless units, which, now being viewed out of context, cannot technically be called units at all.[6] To be a "unit," the thing must be part of a larger thing, and hence in relationship with it (there is a connection, after all, between *unit* and *unite*).

In his early publications Pike referred to the concept as a *grammeme*, later adopting *tagmeme* when he realized that contextual units could be found *everywhere*, not just in grammar. It could be a sound or sensation, a tree or concept, an action or facial expression, a philosophy, belief, or work of art. It could be the subject of this fugue or one of its sequential episodes, pedal tones, or but a single chord. Alternatively, it could be this fugue in the context of the *Well-Tempered Clavier* cycle.

In his 1970 collaboration with Young and Becker (*Rhetoric: Discovery, and Change*), Pike wrote that, "The familiar becomes the key to understanding the unfamiliar."[7] To express the unshared experience is in fact the purpose of all language. Here Pike would have interpreted *language* very broadly to include practically everything that we do -- from the clothes we wear to the way we fix our hair, to what we call "art," and the music we listen to. Every choice "texts" a message. The nucleus of the writer's message," he continues, "is an unshared experience. The writer is the insider speaking to outsiders; enabling them to

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> I see that Christianity in believing a Creator pulls together more facts, data, inner experience and ability than any mechanistic view could hold for me. If I were to adopt pure mechanism as a philosophy, there would be no way I could choose to be a scholar.
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> <div align="center">Pike, Languages for Peace, p. 26</div>

[6] *Emic* and *etic* derive from the words *phonemic* and *phonetic* respectively. However, the root "phon" implies that the meaning derives from a spoken sound. Pike's insight was that the emic/etic distinction is applicable to all behavior, including non-sounds. So-called "body language" is both *emic* and *etic*. Were you to lift your arm, it could *mean* something (I know the answer - *emic*), or *not* (I'm stretching - *etic*). It all depends on the context, like your teacher first asking, "Who knows why Bach was put in jail?" For Pike's own account of the invention of these terms, see *Linguistic Concepts,* p. 87.

[7] An important application of tagmemics has been in the teaching of English composition. Pike's *Rhetoric: Discovery and Change,* coauthored with Richard E Young and Alton L Becker (Harcourt, Brace & World, 1970), employs tagmemics to supply students with "the theoretical principles and problem-solving procedures necessary for a distinctly new approach to rhetoric" (from the Preface). A tagmemic analysis of the fugue is justified because music theorists of Bach's day saw the fugue as musical rhetoric.

become insiders to his goal."[8]

Dr. Pike's enduring contribution to linguistics was to invent a method where outsiders could learn how insiders communicate meaning in their culture. Over the years, and to his surprise, he discovered that *tagmemics* could be applied to behaviors of *all kinds*, not just language. As such, it could provide insiders with profound understanding of their *own* culture.[9]

What follows is a tagmemic analysis of the fugue.[10] This approach will also model how a person who is unfamiliar with fugal technique can learn how to hear the multi-layered relationships of polyphonic music.

Before continuing, please experiment with the radio buttons to the right. You can select the particle, wave, and field buttons individually, or in groups (by shift-clicking more than one). Throughout this study of the WTC I have used timelines and animation to represent musical structure. But the animation of a timeline requires one to think first about the fugue as a dynamic process (wave) that is reducible to static and interchangeable entities (particles) in relationship to things both *within* the fugue, and *without* (fields). The inspiration for this approach comes from the diagram on p. 12 of Pike's *Linguistic Concepts: an Introduction to Tagmemics.*

Wave (a dynamic view)

> The writer can choose to view any element of his experience as if it were static, or as if it were dynamic, or as if it were a network of relationships or a part of a larger network.
> Pike, Young, & Becker, *Rhetoric: Discovery and Change*

Pike believed that nothing in human behavior or speech is without motion. Everything is dynamic and wavelike. While we often choose to take "snapshots" of activities in process, these represent but thin slices of a dynamic wave.

To illustrate the fluidity of our experience, imagine an Olympic pole-vaulter in action. What we call "the vault" is actually a complex series of motions that begin with the athlete fixing his eyes on a distant object, grimacing, lifting his pole, rocking on the balls of his feet, leaning forward, taking a couple of bounding steps, accelerating, lowering the tip of his pole, using the inertia of his body to

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[8] *Rhetoric*, p. 95 (see fn. 7). One message that is "texted" by the music one listens to is that of social signification. One "signals" his "belonging" to a social group by listening to hip-hop, or country and western, or jazz, or classical music. It is my belief that this is one reason why listening to classical music is on the decline, because it has been hijacked to signify social elitism. The solution, I believe, is to return classical music to the people. And the medium that I have chosen to do this is the Internet.

[9] Tagmemic theory begins with Pike's observation that we have the ability to learn not just the language, but every behavioral mode and code of cultures unknown to us. Pike, who was famous for his monolingual demonstrations (of his uncanny ability to engage a native speaker of an unknown language and, within a half hour, be speaking with that individual at a rudimentary level), believed that the mind is hardwired for this ability. He came to this conclusion through his interaction with countless people in minority cultures and languages.

[10] To my knowledge, the ethnomusicologist Vida Chenowith has conducted the only application of tagmemic theory to music. SIL maintains a bibliography of her publications.

bend the pole, compounding and redirecting his trajectory upward, flipping on to his back, clearing the bar with bent knees, falling to the airbag, and bouncing to his feet with a grin.

But what are the boundary points of this tremendous wave? Did "the vault" begin when the athlete started running, or when the tip of his pole was dug into the ground? Did it end when he cleared the bar or hit the airbag? Are the boundaries different for the referee than the spectator? Is the photographer's timeless freeze-frame "the vault," or must this conjure the memory of a dynamic happening over time?

All speech is also heard in waves. Consider the following from Shakespeare: *As You Like It*.[11] In real speech, the words are smeared together in one continuous wave--more like:

asyoulikeit

Had you noticed that words-in-their-wave are not pronounced the same as alone? The /y/ in *you*, when preceded by the /z/ in *as*, is replaced by the /ž/ in *azure*. Similarly, the /k/ in *like*, when followed by a vowel, is attached to the beginning of the next word. In consequence, what native speakers hear as four words might be heard by the outsider as three.

azzieu lie kit

Here is another example of how "the wave" alters pronunciation. Think about how you would pronounce: "in Texas, in Ohio, in California, in Montana." Are you sounding the preposition in the same way each time? Are you sure? Maybe you are actually saying: *in, ih, ihng,* and *ihm* respectively--changes required by the word following the preposition.

When letters carry the same meaning despite sound changes caused by their wave-in-context, we call them allophones. In the foregoing examples, the meanings were the same, but the sounds were different. Another example is the vowel in the definite article "the": e.g. *the cow* versus *the alfalfa.* Were I to ask you what is the first word of "the alfalfa," you would reply, "thuh" and not "thee." Your reply would indicate that you understand the pronunciation of "thee" to be an allophone (of the same meaning) as the root word, "thuh." It might surprise you to realize that a person who doesn't know English would hear these as two *different* words. Now consider the opposite state of affairs.

Were I to ask you, "What is the meaning of the first word in "Thee do I love," you would realize that "thee" can be both an allophone of "the" and the familiar pronoun "Thee." The same is true of *to, two, too.* Thus English also admits words that sound the *same*, but with *different* meanings. In these instances, the meaning is found in the contextual field in which the word is set.

Pike was very fond of such ambiguities, as they comprise the basis for puns. When I was a youngster, I remember him asking, "Why is a moth flying around a

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[11] Pike, *Linguistic Concepts: an Introduction to Tagmemics* (1982), p. 118.

lighted candle like a gate blowing in the wind?" Answer:

> If it keeps on, it singes its wings.
> If it keeps on its hinges, it swings.[12]

Earlier I noted Pike's invention of the terms *emic* and *etic*--the first having to do with meaning, and the second not. Think about the phon-*etic* of the letter "m". Alone, it is meaningless. But if you say "Mmmm" while inflecting your voice up and down, rolling your eyes, and rubbing your stomach, it becomes phon-*emic* (a sound with meaning). There are other ways to say the same thing: "That sure was delicious!" for example.

In Pike's view, any given *emic* structure (meaning) may have many *etic* waves (generative contexts). Not only so, but the same *etic* can, depending on its field, produce a different *emic*. Compare the excited exclamation of "Beautiful!" by two different people, one after a movie, and the other after an auto accident.

Like the pole vault and native speech, a fugue is also a wave. In any given millisecond, we are listening to a thin slice of sounds that are in a continual state of flux. One might think of the fugue as a continuous deformation of silence, or nothingness. Among other things, the timeline represents pitch deformations produced by the contour of the fugue's subject. This idea, represented in waves, pushes itself to our consciousness awareness in about two-thirds of the work.

However, like the pole vault, it is sometimes difficult to pin down when each wave begins and ends. As anyone who has spent time at the ocean can tell you, its waves are *noncoterminous* -- the end of one overlaps the beginning of another. They are often at cross currents with each other, and shorter waves exist within the span of longer. Fugal analysis always begins by listening to its waves. The challenge, as with the pole vault, is to identify symmetries and repetitions. Ultimately, we want to determine where things begin and end so that we can talk about them as particles.

Particle (a static view)

> People conceive of the world in terms of repeatable units. In the continuously changing, dynamic flow of events, there are always recognizable, namable, recurring 'sames' -- discrete units of experience. Although every instant in life is different from all previous instants, people act as if things were constant, as if situations or events could occur repeatedly.
> Pike, Young, & Becker, *Rhetoric: Discovery and Change*

Pike was fond of quoting the Greek philosopher Heraclitus, who observed that

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[12] *Linguistic Concepts,* p. 129. Two more classic "Pikeisms" are found on p. 119. Why is a mouse like a pile of hay? Answer: 'The cat'll eat it.' or 'The cattle eat it." Why did the widow with two sons name her ranch "Focus"? Answer: 'That's where the sons raise meat.' or 'That's where the sun's rays meet.' To mime the principle of pitch enharmonics, I composed the following: "This emic riddle should not bamboozle eyes that recognize the sting of lies (or flies): Beware, the Count erodes their May romance; beware the county roads, there may roam ants."

you could never step into the same river twice. The next time you step into the river, both you and the river have changed. This famous maxim brings into sharp focus our need to "particalize" the stuff of our wavelike world. The psychological impulse to do this is so strong, that we call things "the same" even when they are not precisely so.

Not only is this our psychological reality, it is essential for communication. We need to see the world in repeatable units in order to make sense of it and talk about it. In *Linguistic Concepts* (p. 52), Pike wrote that, "Normal social behavior requires that we be able to recognize identities in spite of change. Unless we can do so, there can be no human society as we know it." This fact was also recognized by the Greeks, who understood that, if a man is not the same person today, we could not submit a bill for an expense incurred yesterday.[13]

Our need to compartmentalize our environment presents us with a dilemma: if no two units are precisely identical, then what degree of variance can we tolerate before concluding that they are of different import and meaning? Much of what we do in music theory is devoted to answering this question: What differences can we tolerate, yet call a thing "the same"? Pike understood the impasse. "Recognition of a unit" he wrote, "involves a curious difficulty: We do not know what something is unless we know something about what it is not." Upon this basis, he concluded that, "Recognition is, in part, negative. In part, it deals with the contrast between units, rather than with the identification of isolated unity."[14]

The dilemma of particalization, range of variability, and appropriate range of occurrence is absolutely essential to the success of a fugue. The entire concept requires the recognition of units that are repeated with slight variation. If too much variation, the listener will not hear the "sameness" required to perceive variation at all. In the following words, which Pike wrote of spoken language, he could just as well have described a fugue: "We are especially interested in those features of a unit which may change *without causing the loss of recognizability* of the unit."[15] Before detailing how this concept applies to fugue, another sports analogy is in order.

In 2001, against all odds, the Arizona Diamondbacks won the World Series. Courtesy of my colleague Dr. Bruce Reiprich, I was lucky to attend one of the National League playoff games leading up to that event. This exciting series, the first played in Arizona, involved two extra-inning games and three late-inning comebacks. It was only the third series to end in Game 7 with a bases-loaded hit in the bottom of the last inning. This outstanding achievement occurred in the 4th season of their existence, a record that still stands.

After their series win, the Diamondbacks traded co-MVP pitcher, Curt Schilling, to the Red Sox. Other than four National League Western Division Championships, the Diamondbacks have not since approached their stunning

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[13] "Identity in the form of continuity of personality is an extremely important characteristic of the individual. If continuity were not part of the identificational characteristics of man, a person could not be sent a bill today for something he bought yesterday, as the Greeks seem to have implied." (Pike, *Language in Relation,* p. 656)

[14] *Linguistic Concepts,* p. 42.

[15] *Linguistic Concepts,* p. 52. The emphasis is Pike's.

2001 victory. While I lament that they are "not the same team," my friend Bruce, being from Massachusetts, was actually delighted by the Schilling trade. In truth, he and I both understand that the Diamondbacks really are the same team. They continue to play in the same Bank One Ballpark in Phoenix, and they wear the same uniform (one of the reasons why teams wear uniforms in the first place). While there has been an unusual range of variability in their record, we still think of the Diamondbacks as the same team.

The subject of a fugue is like that, ever set in the context of a different "series." Sometimes the subject is traded to the alto, and later to the bass. At times it starts in the key of C, later in B-flat, only to return with great fanfare to the "home team" key of F. In point of fact, the subject of this fugue is heard seven times, never twice in precisely the same context.

The particles of this fugue are of two types: two little dips in quick succession followed by am arch-like wave in steps. We'll particalize these as two swooshes and a triangle (here superimposed upon the wave). Now take a moment to study the timeline. How many times are "the swoosh" and wave combined? Yes, seven times, that is the right answer. Notice the unique entry toward the end, where the swoosh is heard four times before the wave.

Had you noticed how the subject sometimes begins with a rising 5th, and at other times with a rising 4th? While these two are very different in their interval content and in how they map on to the scale, we perceive both as "the subject." In calling them "the same," we realize Ken Pike's observation that: "A language is, in a sense, a theory of the universe, a way of selecting and grouping experiences in a fairly consistent and predictable way."[16]

Field (a unit in relation to other units)

> There are certain indications in science and many in mathematics
> which point to the analysis of structure as the mathematics of the
> future. In simple language, it is not things that matter, but the
> relations between them. Thus topology with its spatial
> visualizations of intricate relations between abstract "objects" is
> making possible a basic but still difficult analysis of relations.
> Ladis Kovach, *Life Can Be So Nonlinear*

Remembering Pike's definition of a *tagmeme* as "a unit in context," it bears asking, "a unit of what?" Since we've already observed that it could be a unit of *anything*, it is important to note that it is not *the thing itself* so much as *its relationship to other things.* Pike, Young, and Becker acknowledge this when they write, "Part of what a unit *is* is its relationship to other units; this, we believe, is true of all human experience" [5].

Thus it is useless to assert the meaning of "cow" without reference to others of her kind, her purpose and destiny (as meat or milk), the farmer, and the field. In other words, there is no intrinsic meaning in "cowness" apart from an extrinsic web of relationships between her and what is "not cow." And yes, there is a good

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[16] *Rhetoric,* p. 27.

reason why I write at this moment of cows. You see, cows live in fields, and "the field" is where all of these relationships between units also dwell.

A good example of the importance of "the field" as one of the primary players in meaning would be to compare the American usage of *fat* and *slim*. In the dictionary they are antonyms. But "fat chance" and "slim chance" mean exactly the same thing! American English is the field that determines the meaning.

Baseball players also function in fields, with their slot in the field reflecting their function--shortstop, third baseman, catcher, and left field. Additionally, the meaning that we give a player is conditioned by his home field--Yankee Stadium vs. Wrigley Field. Curt Schilling on Chase Field means something quite different from Schilling in Fenway Park. The difference recalls his trade to the Sox. For a Diamondback fan like me, that connotes a different meaning than it does to a Sox fan like Bruce.

Shortly we'll have more to say about the field relationships of this fugue. For now, just know that the animation reflects the relationship of the fugue's subject to its answer. As you can see, the last statement forges a synthesis of the two. We conclude this section with Pike, Young, and Becker's buildup to the centerpiece of their book on rhetoric--what they call *Maxim 2* [see fn. 7].

> Any unit of experience can be seen as a complex system composed of interrelated parts, or subsystems, each of which is in turn composed of still smaller systems, and so on until some elementary subsystem is reached.

> Maxim 2: *Units of experience are hierarchically structured systems.*

Slot, Class, Role, and Cohesion

> Cohesion with various kinds of larger background context . . . is essential for normal communication.[17]

Pike's intuition of strong links between language and behavior remains another important contribution. His seminal publication, *Language in relation to a unified theory of the structure of human behavior* (see fn. 4), suggests that qualities of slot, class, role, and cohesion are found everywhere. Let's illustrate this first in English, then in things as American as apple pie and cars. Compare the following.

> The cow is in the alfalfa.
> The alfalfa is in the cow.

Both sentences use the same words, but the sense is fundamentally different. The difference is purely a product of order, or "slot" (what grammarians call *syntax*). Because they are interchangeable, "cow" and "alfalfa" belong to the same *class*. It is the class that we know as *nouns*.

In the first sentence, the cow's *role* is that of *subject*, with "alfalfa" being the

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[17] Pike, *Here we Stand: Creative Observers of Language,* 1980.

object of the preposition. In the second sentence the roles are reversed. In both, the rule whereby the one interprets the other represents *cohesion.*

But most words can't interpret every another, at least in normal speech. This is true of grammar, but also of illusory or surreal thoughts. Some combinations simply challenge the sense of cohesion. "The cow is in the alphabet" is absurd! That said, unusual coherences comprise the basis for humor and word games ("The cow is in her scowl"), not to mention the stock in trade for poets--the metaphor:

> The cow is the mown alfalfa,
> And the alfalfa's breath is she.

In language, when word order affects the thought, we say that its meaning is *syntagmatic.* The slot of a word, as well as its role, and cohesion, are syntagmatic because these functions employ word order. By contrast, the noun class to which *cow* and *alfalfa* belong is *paradigmatic*, with each having a dictionary meaning independent of its grammatical slot. While *parts of speech*--nouns, verbs, and prepositions--are paradigmatic, the slots in which they occur, as well as the syntactic rules that knit them together, require cohesion.

In linguistics, this type of study is known as *paradigmatic analysis*, as in the table above (also known as *slot-class analysis*). We'll apply the method to this fugue in a moment. For now, Pike theorized that *everything* with meaning (every *emic* unit) is generated of relationships between slot, class, role, and coherence. He called the complex of interactions that produce meaning, a *tagmeme.* A good analogy would be baking a pie, where *meaning* is the pie, and its *tagmeme* the aggregate of directions in the recipe and ingredients, plus the physical acts of measuring, stirring, rolling out the dough, fitting the crust in a pan, filling it with apples, and baking the pie itself. Tagmemic variation is produced by a dollop of French vanilla ice cream, your grandmother having baked it for your birthday, or pumpkin pie with whipped cream on Thanksgiving.

In this manner Pike was able to apply tagmemics to behavior in sum, not just language. The truth of his theory should be apparent to anyone in the habit of watching the Super Bowl, the World Series, or Julia Childs teaching us how to poach an egg. Think for a moment about the meaning of automobiles in American culture. We all know that cars occupy an important slot in the average self-concept. What meaning or worth might you attribute to my driving a Lamborghini? Just kidding! I actually drive an eleven-year-old Toyota pickup. As to its role, I like hiking in remote places, so the high clearance and four-wheel drive help. A Lamborghini in these places? Well, let's just say that this would present a problem of cohesion.

As an experiment in the application of the tagmemics to wordless human behavior, watch this ingenious seatbelt commercial then ask yourself: Is the meaning syntagmatic or paradigmatic (would it make sense if you watched it backward)? How would the sense change if the characters were to exchange slots? What might be learned from the movie by a person who had never seen a car? How would the meaning change if the chair were occupied by a newborn?

The *Tonemic* Experience

We've come now to the most important part of this analysis, the part devoted to the fugue's *meaning.*[18] In order to get at that meaning, we'll use the *tagmemic* method developed by Kenneth Pike in his interaction with preliterate people of cultures and languages most unlike our own.

Tagmemics begin with an assumption that meaning is *experiential* and *real,* as opposed to nominal and abstract. As noted in the first sentence of this analysis, meaning "happens" when people interact with other people and things. The foundational principle is one of *relationships.* Meaning is relative; it can't occur without connections between people and objects in their environment.[19]

The primary connection that underlies *all meaning* is that of the observer to the observed.[20] Here it is essential to acknowledge that the observer, being *in relationship with the observed,* is not an impartial actor. One cannot listen to a fugue, or analyze it, as one might analyze the sparking of subatomic particles in the Large Hadron Collider.

Although it may require some time to digest the following quotation, the present analysis will make little sense until we do. As you read it, bear in mind that Pike here denies any possibility of pure objectivity when it comes to the study of human behavior. His claim is that the observer (a human being) who exists *in the event* (among other humans), is therefore both the observer *and the observed.*

> In this chapter I am rejecting all views of language or life which claim that *abstract* forms comprise basic reality. Here [in this book], as over against centuries of work by some scholars, *form* is a term used to refer to concretely structured elements which include a physical component, not idealized disembodied realities, essences, ideas—or even rules or relations. In addition to form, a meaning, relevance, value, significance, deduced cause, result of deduced cause, or some other *observer-related component* is always demanded in our affirmation of the existence of any unit of rational behavior, of the existence of the observability of any concrete object or event, or of any object or event as deduced by man or imagined by man.[21]

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[18] Because our focus is meaning, the analysis is *semiotic*--pertaining to that branch of scholarship devoted to communication, sign processes, and signification. The study of semiology in music has been historically popular in France, but less so in the United States, which has been dominated by the formalistic systems of Schenkerian analysis and pitch-class sets.

[19] The presupposition is, further, that we form these connections precisely because they are meaningful, or in the expectation that they will be. We do not compose fugues, or perform them, or listen to them, as a senseless waste of time.

[20] With people to other people, meaning happens in an *I and Thou* relationship. With people to objects, the relationship is *I and it.* See Martin Buber.

[21] Pike's introductory paragraph to the chapter on "Form and Meaning" in *Linguistic Concepts,* p. 111. Two pages earlier, he had rejected pacification of "the snarls of a dominant scientific paradigm" as (in his analogy) the victim conciliating the tiger by allowing himself to be eaten. He writes: "But if those postulates cancel the possibility of including the observer himself in the situation and among the data observed, and hence of observer flexibility in choice of viewpoint

Paraphrasing Pike, his assumption (and he would be the first to acknowledge it as such) is that *all meaning* comes in relationship with the observed. As such, meaning is the product of the observer *becoming enmeshed with the observed,* and vice versa. Meaning is the product of human existence in relationship with other existing things. As a philosophical system, the tagmemic approach is therefore *existential*--the human person must *exist* before he can communicate, be logical, or think in abstractions. In Pike's own words, "We cannot *start* with logic, unless we *first* have 'ourselves'."[22]

Were Pike with us today, he would no doubt then suggest that we cannot apply his method without agreement that the fugue is not so much a logical abstraction, as pure experience. Although he would surely concede that meaning can involve abstraction, the meaning itself derives from *experiencing the abstract thing* and not in the abstraction per se.

We therefore have a vested interest in the relationship--an interest that the poet, John Ciardi, called a *sympathetic contract.* We expect that "the thing" will indeed be meaningful to us, and that it is worth giving it thoughtful reflection. In short, to succeed in this type of analysis, we must allow the fugue to become part of us, and we part of it.

One final note on terminology before proceeding to the analysis proper. In the title of this section I have used the word *tonemic.* Here it is my hope to unite the musician's conception of tone and tonal with Pike's terms *emic* and *etic* (see fn. 6). Whereas the linguist would use *phonemic* and *phonetic* (with "phon" indicating a spoken sound), I use *tonemic* and *tonetic* (with "ton" as a tonally-centered musical sound).

In the following analysis, I will make the case that one meaning of a Bach fugue is found in its tonal relationships. In that sense, the fugue is *tonemic.* There will be those who will object that its primary meaning is found in its *motivic and contrapuntal relationships,* in which case the meaning is *motemic.* My own view is that it is both, and then some. I will therefore conclude with an argument that the fugue's tonal relationships constitute its *tonal tagmeme,* with its counterpoint being a *motivic tagmeme.* These two exist, further, in relation with its *referential tagmeme,* which is the fugue as genre, the place of this particular fugue in the *Well-Tempered Clavier,* the place of that cycle in Bach's compositional output, and the place of Bach in history. These relationships
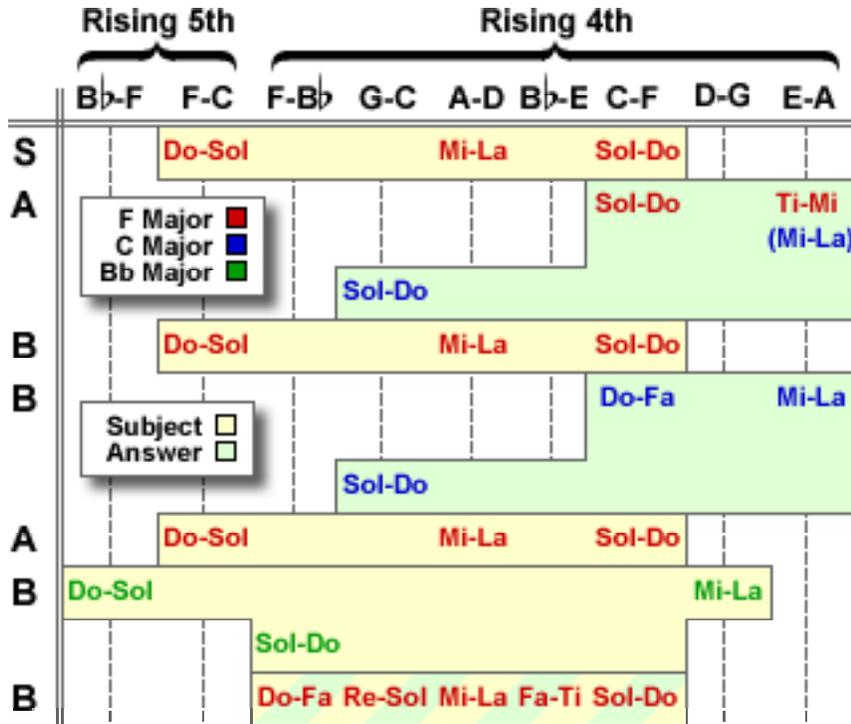
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and in the possibility of adopting different viewpoints for different purposes of the moment, one has allowed his scientific freedom to be swallowed up and science itself to become *nothing but* an unattainable abstract ideal in a dreamed-of unreachable reductionism, or else in an abstracting idealism which splits me from you, us from things, and things from human knowledge."

[22] *Talk, Thought, and Thing,* viii (see fn. 2). Although Pike claimed to be untrained in philosophy, his tagmemic method is permeated with implications of *theistic existentialism* (although I suspect that he would not have chosen this label). That said, his writings consistently begin with existence as the necessary precursor to all else, with meaning deriving from existence and not the other way around. In that sense, Pike's method belongs to the venerable class of thinkers that includes Søren Kierkegaard, Fyodor Dostoevsky, Leo Tolstoy, Nikolai Berdyaev, Martin Buber, Karl Barth, Rudolf Bultmann, Karl Jaspers, Gabriel Marcel, Paul Tillich, and Reinhold Niebuhr.

comprise the rich and varied source of "fugal meaning."

Of Musical Meaning

Try moving your mouse over the table below. Reading from left to right (as you would a poem), the rows are *syntagmatic*, with each unit heard in its fugue order. The rows represent the unit's slot in relation to the others. By contrast, the columns are *paradigmatic*--an out-of-order grouping of units by class. The table presents the primary interval and pitch classes of the fugue's subject--rising 5ths and 4ths.

	Rising 5th		Rising 4th						
	B♭-F	F-C	F-B♭	G-C	A-D	B♭-E	C-F	D-G	E-A
S		Do-Sol			Mi-La		Sol-Do		
A							Sol-Do		Ti-Mi (Mi-La)
				Sol-Do					
B		Do-Sol			Mi-La		Sol-Do		
B							Do-Fa		Mi-La
				Sol-Do					
A		Do-Sol			Mi-La		Sol-Do		
B	Do-Sol								Mi-La
			Sol-Do						
B			Do-Fa	Re-Sol	Mi-La	Fa-Ti	Sol-Do		

Legend: F Major ■ (red), C Major ■ (blue), Bb Major ■ (green); Subject □, Answer □

Paradigmatic Table

Begin by clicking on each dichord of the table's header row, which is limited to the diatonic set of pitches in F Major. The two rising 5ths are Bb-F and F-C. The row continues with every pair of rising 4ths possible in the diatonic set.

It is important to recognize that the first row is *tonetic*; it has no more meaning than a scrambled recitation of the alphabet. Like the sound of an out-of-context letter /m/, each pitch has no implicit tonal meaning more than its mere belonging to an F major scale. Minus a tonal field, it is impossible to attribute tonal function to any of these pitches: tonic, dominant, or subdominant, etc. Each dichord belongs, in this sense, to a *class* of substitutable items. This concept should be very familiar to music theorists, who are accustomed to identifying intervals and pitches by "class."

By contrast, when each dichord is heard in a key, its interval and pitch *classes* become *tonemic*, or "tonally meaningful." In terms of Pike's tagmemic quadrant-- slot, class, field, and cohesion--the fugue's key of F major provides the

tagmeme's *field*, with tonality itself the *cohesion*.

To reinforce this distinction, the *tonetic* pitch classes of the first row are represented in black. By contrast, the columns in the table contain solmization syllables *in color*. The red, blue, and green syllables indicate *minimal tonemic pairs* in F, C, and B-flat major respectively.[23] As *minimal pairs*, each dichord is emically distinct from others of contrasting color, with each color in the paradigmatic table representing different keys.

Before drilling down further, it bears notice that this collection of intervals, while strongly suggestive of F major, need not be limited to that key. The table indicates that they are in fact distributed among the keys of B-flat, F, and C major.

So, let us review. The table's header row represents tagmemic *classes*, with the various keys being *fields*. The solmization syllables in color represent tagmemic *roles*, with their order, left to right, being tagmemic *slots*. A tonal tagmeme (or what I have proposed to call a *toneme*) is any permutation of these four. For example, the *tritone tagmeme*, which is heard only once as a figure in the subject, has the following members.

Class: Bb-E
Role: Fa-Ti (mystery particle)
Cohesion: F Major
Slot: no. 4 of the subject's final statement

Now let's consider this fugue's relationships of role to slot in more detail. Compared with the subject entries (yellow), the fugue's answers (mint) are many times more complex. Before proceeding, please review the distinction between a subject and answer.[24] In brief, both belong to the broad class of particles that we call the subject. "The answer" is a subclass of subjects with altered intervals but the same contour and rhythm. In other words, the fugue's answer is its subject just as a peach is a fruit. Similarly, just as "thuh" and "thee" are *allophones* ("the cow" and "the alfalfa"), the fugue's subject and answer are *allotones*.

Observe that the fugue's first answer begins with Sol-Do, the inversion of the subject's Do-Sol. Because the latter is always heard in slot 1 of the subject, one might suspect that the former would do the same with the answer. But this does not represent the case. In point of fact, every statement of the subject and its answer *ends* with Sol-Do. Listen to all of the F major pairs (red) in column 7. After you've done that, listen to the blue pairs that end the fugal answers (column 4), and the green pair that ends the Bb major statement of the subject (column

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[23] In language, a *minimal pair* is two words--like *seal* and *zeal*--with one difference that changes the meaning. In this case /s/ and /z/ are *emically* contrastive. Pike writes:

> We hear differences best when we them in a near identical context. Good procedure for phonological analysis encourages us to listen to the respective sounds in contexts that are as much alike as possible.
> *Linguistic Concepts,* p. 44.

[24] This fugue employs a *tonal* relationship between its subject and answer. In a *real* relationship, the answer is a transposition of the subject with intervals preserved.

3).   They are all Sol-Do! Accordingly, Sol-Do has more of a syntactic connection with "ending stuff" than beginning.

In consequence, the beginning of the first answer (Sol-Do) is heard as an echo of the subject's end. The elision implies that the subject and answer are in an antecedent and consequent relationship; the prior idea is psychologically "open." This means that it requires closure to the latter thought, a closure that is completed by the answer.

Notice that the middle pair of the fugue's first answer contains a parenthetical Mi-La (in blue) beneath Ti-Mi (in red). This represents our hearing of the pair, initially in F, as Ti-Mi, but retrospectively as Mi-La after the modulation to C. This type of re-hearing represents one of the richest "meanings" in music listening. It could be likened to the difference between *to, two,* and *too.* In both, the meaning depends on the field.

Another illustration of "before and after" meanings in music is the Before-and-After category on Wheel of Fortune: e.g. *Eggs Benedict Arnold.* As we approach the interval class E-A from the key *field* of F major, its *role* is Ti-Mi (*Eggs Benedict*). But after modulation to C, the same interval is heard, retrospectively, in the role of Mi-La (*Benedict Arnold*). All this to imply that the meaning of *Benedict* depends on whether it is poached with *Eggs* or hung with *Arnold.*[25]

But let's proceed to the most interesting tagmeme of this fugue. It has to do with the miniscule B-natural at the beginning of the second answer. This naturalized B makes us hear the *entire entry* in C. At the analogous point in the first answer there had been a B-flat, which made us hear *that* one in F, with modulation to C.

Because of the B-natural at the beginning of the second subject, its aperture pair is heard as Do-Fa rather than Sol-Do of the first answer. Study the table closely and you'll discover that Do-Fa is heard only twice: in the second answer, and in the final statement of the subject. You'll notice too that I've represented this final statement in stripes of yellow and mint. This is to suggest a synthesis of qualities in the subject *and* its answer.

All of this is leading up to something of course. I'm about to make the case that there is a syntactic role to each of these pairs. Just as in language, where *cow* means one thing in "The cow is in the alfalfa," but quite another in "The alfalfa is in the cow," Sol-Do means one thing as the answer's aperture particle, and quite another as the subject's peak. The former is "beginning stuff," while the latter is "ending stuff."

Now study all of the instances of Mi-La. This interval, like all of the others (except the Bb-E tritone), is a rising perfect fourth. But notice that it is *always* "middle stuff," or what I call a *bridge particle*. In the following table, you'll

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[25] To those having trouble connecting the dots here, *Eggs Benedict* is traditional American breakfast fare, while *Benedict Arnold* was an American traitor. Seriously, the word *Benedict*, as used in these contexts, is a homonym. Yes, I know, we ordinarily think of homonyms as words with different meanings that sound the same. But is that not exactly the case with *Benedict*? Does it not mean something different in each context? If your answer is yes, then you understand how meaning does not inhere to the word itself, but to the contextual field in which it is heard. The same is true of Mi-La.

15.

discover the effect that a pitch's role has upon its slot, and vice versa.

Role to Slot

	aperture (beginning)	bridge (middle)	peak (end)	mystery particle
Do-Sol	always			
Sol-Do	sometimes		sometimes	
Do-Fa	always			
Mi-La		always		
Ti-Mi		always		
Re-Sol				always
Fa-Ti				always

(legend box: F Major □, C Major □, Bb Major ☑)

Table of Roles to Slots

Observe that *every instance* of the subject (as distinct from the answer) begins with a rising 5th. Additionally, rising 5ths are heard only in slot 1 of these subject entries, where they are always Do--Sol. Because of the unique association of the rising 5th with the beginning of the subject, its role is that of an *aperture particle*. The rising 5th is an aperture particle because it is syntactically coherent only when heard in slot one of the subject. Nowhere is a rising 5th heard in any other position. This is like saying that "Once upon a time" is well placed at the *beginning* of the fairy tale, and "they lived happily ever after," at the *end*.

Similarly, the role of Mi--La is reliably that of a *bridge particle*. By contrast, Sol--Do can serve either as an aperture particle (but only in the fugue's answers) or as a peak particle. While it can serve in both slots, it is significant that the peak slot in *every voicing of the subject and answer* is reserved for Sol-Do.

We could of course continue in this vein for a long time. I am much more interested however in making the point that tonal structure is like a language. In order to make this more effectively, I've prepared one final representation. It can be accessed by clicking the red question mark in the legend. Perhaps you discovered this detail earlier?

The animation represents the tonal tagmeme of this fugue. The large circle in the center is the *tonal field*, which alternates between F Major (dusty rose), C Major (lavender), and B-flat (mint). The black pitches on the inside are the tagmeme's *class array*. Within the diatonic system, these pitches function in various *roles*, represented by the "rolling" circles on the circumference of the

16.

large circle. Thus the pitch class "C" functions as *Sol* in the key of F Major, but as *Do* in the key of C. At every hearing of the subject, these roles activate in pairs, with each pair identified by *slot*: aperture, bridge, or peak.

One might ask, in conclusion, what is learned from this approach? The most important revelation is that the fugue involves a continual wavelike forging and transformation of relationships. It is *in these relationships* that the fugue's meaning is found. It is *not found* in its elemental ingredients, but in the *fugal process*--a game of sorts, that makes tonal relationships happen. Meaning, like the flavor of a cookie, is *not* found in its flour, sugar, or molasses, but in the mixing, baking, smelling, and tasting of the ginger snap itself. The excitement of a baseball game is not found in the players occupying their positions on the field, but in how fast they throw the ball, to whom, and why, and how well.

A second revelation is found in the fugue's *mystery particle*. If you've been following the residual "breadcrumbs" (rectangles) of each successive dichord, you'll have noticed that the *tritone class* Bb-E is not slotted until the end. I've heightened the anticipation of this "mystery particle" by a flashing question mark. As you watch this icon, think about the incompleteness of the circle without this odd interval.[26] You may recall that the augmented fourth (a.k.a. "tritone"), at one time vilified as "the devil in music," is particularly diabolical in its ascending melodic form, as heard here. The analysis reveals that Bach has reserved this problematic pair for the moment of greatest inertia--the moment when the ear, sufficiently conditioned by every conceivable synthesis of slot and role, is able to attribute some level of coherence to even this obstreperous class! Then, having heard it, the circle and fugue are closed.

The final revelation of this approach is found in Pike's conception of interlocking and nested tagmemes. He observes that *meaning changes with focus*. As we hone in on smaller elements, we discover that each contains a tagmemic universe of its own, with its own fingerprints of slot, class, role, and cohesion. There are limits of course to how far one can drill; at some point we presume to discover the irreducible *quark* or *string* beyond which one cannot go.[27] But the tendency to examine relationships in ever-smaller units reflects an intuition of meanings nested within larger meanings, and the aggregation of micro-meanings to create the macro: e.g. a Mandelbrot zoom versus the Hubble Ultra Deep Field.

For example, this work represents what Bach would have called a *partimento fugue*, (vis. a vis. a fugue in strict counterpoint). This means that it came into being as an improvisation upon a thoroughbass sketch of common knowledge (roughly equivalent to what we'd call an harmonic outline). In improvisation, it is much more difficult to maintain the number of voices, with this work being a

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[26] In all that transpires before the modulation to B-flat, there remain three lacunae, two of which are filled by statement of the subject in that key (the subdominant). It may well be that the motivic fourths of the fugue's subject represent the harbinger of this unusually pronounced modulation.

[27] Pike's terminology of language as *particle*, and *wave*, is famously borrowed from the *field* of subatomic physics. If (as we now think) the irreducible thing is a quark, then it is a particle. But if string theory gains the ascendancy, then the irreducible thing is a wave. I suspect that Pike would have leaned toward the latter.

fugue for three. However, the hearing of four subject entries in the fugue's exposition gives the illusion of four voices. What I have just described is a referential tagmeme that can be superimposed upon the tonal tagmeme (toneme?), our main focus. Similarly, we might have concentrated on rhythmic and motivic relationships and how their interaction with the toneme creates even more complex and varied shades of meaning.