

Fugue No. 17

A-Flat Major

Well-Tempered Clavier Book II

Johann Sebastian Bach

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To read this essay in its hypermedia format, go to the Shockwave movie at <http://www2.nau.edu/tas3/wtc/ii17.html>.

The image displays two staves of musical notation for Fugue No. 17. The top staff is labeled 'Subject' and the bottom staff is labeled 'Answer' and 'Countersubject'. Arrows point from the labels to the corresponding musical phrases. The music is in A-flat major and 3/4 time.

Subject: Fugue No. 17, *Well-Tempered Clavier*, Book II

A Beautiful Story

Let us begin with a beautiful story: the tale of the Chinook and how she forsakes all for the sake of her children. Having spent her adult life at sea, she now turns her nose toward that particular estuary down which she had swum some six years before. Her destination? The very stream where she was born! Now, in one of the most demanding and dangerous migrations of the animal kingdom, she will complete the cycle of her kind.

Having survived the commercial fisheries, seals and otters, sharks, killer whales, and countless perils of the ocean deeps, she has left her ancestral feeding grounds and reentered fresh water. From this point forward, while she may be lured to hit an occasional cast fly, she will not eat. Although she does not know it, she is dying; her days are numbered, coming to an end. She will face these, the most perilous of her life, with the greatest courage. Between now and then she must outwit birds of prey and predacious mammals, the eagle, osprey, bear, countless 'sports' fishermen, obstructive dams, the Native American's fish wheel, and the poacher's gill net, picket weir, and trap.

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But those who would kill her for food (or pleasure) are of her least concern. She must defeat time itself, and space. Her final journey (for some individuals more than a thousand miles, in many weeks) will require her to scale hundreds of waterfalls, some as high as fifteen feet. Many times she will misjudge the leap, her body slamming onto jagged rocks that will inflict large patches of bruised and dying flesh. She may simply run out of energy. Her exhausted body, filled with its promise of another generation, may begin to go with the flow, descend to the river's depths, and decay. If she survives, she may discover her birthplace wretchedly wasted--silted over by clear-cut forests--not the bracingly cold and crystal waters essential to the survival of her species.

We shall return to this creature, this fish, in due course, but not without having first applied, to her, the rich poetic imagery of Job and his warhorse. She catches the scent of battle from afar, leaping like a locust, her glistening body swallowing the air, like an arrow. In the blast of waterfall she says "Ha!," propelling herself forward with great speed; she cannot stand still. With frenzied excitement she charges into the fray, rejoicing in her strength, laughing at fear. For the sake of that purpose to which she was created, she glories in the *harsh and difficult passage*.

In Answer to a Baffling Question

I am drawn to this story not just for its beauty, but also in pursuit of an answer to a baffling question. It is a question that this fugue has asked, and that I believe Bach himself has answered. The question is: "What does this idea have to do with that other (heard now in the low voice)? In more technical language, "Does this joyous subject *really* belong in a fugue with such a lamentable countersubject?" The first melody is sprightly, diatonically disjunct, full of difficult leaps, and alive, while the second is morose, chromatically conjunct, and resigned. Do these motifs go together, or do they fight? Does not the one thought negate the other?

There is, of course, a contrapuntal reply to these questions--a reply that is rooted in centuries of harmonic and compositional technique. Such an answer would also address the rich pedagogical tradition of thoroughbass and improvisation. If this is the answer that you seek, one could hardly do better than to explore this page and get its examples under your fingers. You can also click the "counterpoint" button at the lower right.

But this is not the direction that I choose, now, to go. I rather suspect that there is a rhetorical dimension to this fugue--an account that is of much more interest at this particular moment. Such an account might begin like this: "The subject of this fugue, and its countersubject, have as much to do with each other as the leaping Chinook to her difficult passage. These two ideas, in perpetual opposition to each other, make the most important thought of this fugue.

But are these ideas truly in opposition? In one of nature's many ironies, the waterfall that obstructs our salmon's progress is the *very path*, and *only* path, whereby she may arrive at the place where she must go. There is no other way for her. But more importantly, this *is* her way, for she would have no other. To advance, she must summon every fiber of strength and courage that her dying

flesh can muster. She must negotiate that which would move her, unrelentingly, in the opposite direction.

While her only route forward is that of greatest danger, resistance, expense, pain, and potential loss, it is also that of greatest gain. In spite of its potential to undo her every hope, the waterfall is her truest friend. She has, after all, traversed it twice before: first within the battered belly of her mother, then as a fingerling to the sea. As she summons the energy to fling herself over this obstacle for the last time, she knows that this very swift and opposing current is her only pathway home.

Applied to this Fugue

Now let us see if we can apply this thought to the fugue. In the musical-rhetorical tradition of Bach's day, there was an expressive idiom that his contemporaries called the *passus duriusculus*. This term, which means "harsh, brazen, or difficult passage," was applied to highly chromatic melodies such as the countersubject of this fugue. A related melody, the *saltus duriusculus*, referred to the "difficult leap."

History allows us to interpret these "harsh ideas" in two ways, equally valid. First, they were difficult to compose and, in many cases, perform. Only the master composer could handle such ideas without sounding contrived, artificial, or just plain wrong. Such passages were often tonally ambiguous as well, or confusing to the ear, making them difficult to sing, or harsh to hear.

Ironically, because of its musical problems, the *passus duriusculus* was prized by composers for its power to materialize, in musical form, difficult concepts, beliefs, or feelings. In the texted music of this period, the melody of our countersubject was routinely used to set words like *tears*, *crucify*, or *dead*. Of the many Baroque *Affektenlehre* (word paintings), the *lamento* was, without question, the most widely propagated and agreed-upon of "difficult passages." The countersubject of this fugue is exactly that--a lament.

The inexorable tendency of the lament is to drag the fugue down. To counteract this pull, the subject vigorously interjects three roulades of ascending diatonic steps. But for their rhythm, the first and last are the same. Outside of these scalar passages, the subject is unusually disjunct; like the fish caught in the sportsman's lure, it leaps to and fro.

Please understand that we are dealing here with analogies. Our purpose is to develop a heightened awareness of what our ears are telling us about this fugue: there is a tension between its subject and countersubject. This tension should not necessarily be viewed as conflict, for indeed (as soon we shall discover), there is no contrapuntal conflict at all. It is more like countervailing forces where the mere existence of one implies, of necessity, the other. The waterfall, with its perpetual motion in one direction, and the Chinook, with her preternatural need to resist, is a wonderful analogy, as is the tension of the fisherman's line against the struggling fish.

But let us return to the two possible ways of hearing "difficult passages." The one is to interpret them as nothing more than contrapuntal challenges. In this view, the difficulty is purely musical--not to be cluttered by extramusical thoughts.

In the second interpretation, the difficulty lies outside the music, and the purpose is to point to that other thing. It goes without saying that reasonable people can disagree about the weight that one might attach to these two ways of hearing. There are those who emphasize the compositional and perceptual impediments. Others focus on the existential implications, which again have to do with difficulties. Whereas in the first interpretation, the harshness is musical, in the latter it is spiritual. Either way, the operative principle is one of adversity, distress, and potential calamity.

Regardless of one's inclination, our first question should be, "Why would Bach have risked such calamity?" Why would he have balanced this fugue on the brink? Why would he have subjected this joyful thought to the harsh and difficult? I can think of three possible reasons, the first having to do with balance, the second with curiosity, and the third metaphysical.

First, each motif provides a directional or inertial corrective to the other. Each foils the tendency of the other to throw the fugue into aesthetic imbalance. They are, if you please, the work's *yin* and *yang*. With this in mind, one might hear the binary of this fugue, its duality of thought, as the *solution* to potential disaster and not a subjection of the fugue to risk.

A second possibility is that Bach simply could not resist the challenge. His object was to show, in musical form, how paradoxical ideas could coexist. In this view, the fugue is a musical Sudoku puzzle, with the composer's purpose having been to turn the improbable into the actual. If you like this interpretation, then you probably don't care *why* Bach did it. The mere fact that it was done is reason enough.

On the other hand, if you prefer an extra-musical approach, then the fugue is the tonal analogue of joy from sorrow--pleasure from pain--the crown from the cross. Each contains the seed of the other, with the joyful subject in consequence of its difficult countersubject.

But let us return to the homeward migration of our salmon, and her most important lesson. Here I hope to make the case that there is an ecological and environmental implication to all that we have said. In developing this argument, I hope to tie the disparate threads of our conversation into one cosmogenical knot. I intend to show this by identifying what I hear as a metaphysical constant. If this type of argument makes more of our little fugue than you think that it deserves, then you should skip it. On the other hand, if you can stick with me for a while, there are wonderful discoveries to be made.

Which Came First?

The salmon or the egg? This is a serious question, and one to which Aristotle (*Metaphysics*) gave respectable reply. In Western philosophy, the problem has been framed in terms of potentiality versus actuality. For Plato, it was the egg (potentiality) that came first; but for Aristotle it was the chicken (actuality). Thomas Aquinas agreed with Aristotle, and used the argument to suggest that the existence of God is *not inconsistent* with the world that we can see, touch,

smell, taste, and hear.² On the other hand, the brilliant contemporary physicist, Stephen Hawking, agrees with Plato.

Let us personalize the problem by asking it in quite another way. Which came first, life or death? On the surface this may seem like an easy one to answer: of course life comes first. Observe that this answer presumes the autonomy of individual organisms, which are born, then die. Let us think, instead, of the species: which (in the normal course of events) comes first, the parent's death or the child's? The same could be asked of life. Ah, now we can begin to appreciate the problem.

May I show you, in more philosophical terms, what I mean? Let's begin by assuming the following: life cannot exist without death, and death cannot exist without life. Are we agreed? If so, then the question becomes: "Which came first, option A (which can't exist without B) or option B (which can't exist without A)? Do you see the problem?"

Returning to our salmon, science has long known that the species cannot survive without trees. The degradation of forests is one of the primary causes of the salmon's decline in many parts of the world. Trees protect their vital breeding beds, shading them so that they will be of the right temperature for spawning. The forest also clarifies the water, which salmon need for successful propagation. Armed with this information, we might feel confident in saying that the trees came first. The trees are the potentiality that leads to the actual salmon.

But hold your horses! Recently, the scientists have learned that the reverse is also true: the forest would not be the way it is but for the salmon. The temperate rain forest of the American Pacific Northwest is one of a kind. This ecosystem, which contains less than one percent of the trees worldwide, is unique for its giants. The west coast of the United States contains both the tallest trees, and biggest (by volume), in the world. Scientists have now discovered that these trees grew to be so big because they have been fed, historically, on nitrogen 15. There's only one problem; nitrogen 15 comes from the ocean! How then did the trees get their nitrogen 15? From the salmon!³

So, which came first, the salmon or the trees? You can decide for yourself, of course. But in doing this, remember that the salmon's death brings the trees, the bear, the eagle and the osprey life. Humans too, we are told, should eat more salmon.

² *Summa Theologica*, Question 2, on the existence of God. In Article 3, the so-called "First Way," Aquinas employs the argument of potentiality versus actuality to portray God as the prime mover. In *The Dawkins Delusion* (p. 7) Alister McGrath points out that Richard Dawkins, incorrectly asserts (*The God Delusion*) that Aquinas's "Five Ways" claim ontological proof for the existence of God. But Aquinas is very clear (Article 2) that "the existence of God cannot be demonstrated." It is, rather, an article of faith. That said, Aquinas shows the inner consistency of belief in God with what we observe in the material world.

³ Nitrogen 15 (¹⁵N) is a stable isotope of nitrogen that differs from the more common ¹⁴N by one neutron. The latter occurs naturally in the atmosphere and is also produced by microorganisms in the soil. But "marine nitrogen" (¹⁵N) is synthesized at sea. Scientists have learned that up to half of the nitrogen in trees near the salmon runs is in the form of the heavier nitrogen 15. Some writers have called the relationship of salmon to trees a "sacred cycle."

Now let us return to our fugue's problem of potentiality versus actuality. Which came first, its subject (life) or countersubject (death)? In presenting my opinion on this matter, it might be helpful for you to know that I've been thinking about it for more than a year. It is not that I didn't know the answer, but that I hadn't come up with a good way to tell it.

That is when my daughter, Joanna (who lives on the banks of the White Salmon River in Washington State), told me the beautiful story of the Chinook, and how she gains her life by giving it up -- not just to her own kind, but also to the seals, bears, eagles, ospreys, otters, and yes, even the trees. Upon hearing this story I knew that this would be the way to say something very important about this fugue. While its subject comes first *in time*, it is the conceptual fruit of something before it, in thought. That something is a *relationship*. It is the relationship between *itself* and what is *not* itself, namely, its countersubject.

It Can Exist Only In Relation to What Is Not It

The salmon without a waterfall is a fish, but not a salmon. The osprey, without fish, is a raptor, not an osprey. The poacher without law is a fisherman; but the fisherman *without license* is a poacher. The redwood without salmon is a tree, but not Hyperion, the tallest living organism in the world. The subject of this fugue, without its countersubject, is a happy little tune, but not the subject of this fugue.

The essence of a thing is apprehensible only in relation to what is *not of that essence*. Motility is meaningless without stasis; beauty without ugliness; up without down. "Standing still," means one thing to a rock, but quite another to the Chinook. To the latter it is death, but who has ever said, of a rock, that it is dead? We can say that the rock is "not alive," but how could we say that it is dead if it has never been alive? Is not the essence of "the thing" then in consequence of what it is not?

This is the very argument that Aristotle used to conclude that Plato's egg-came-before-the-chicken logic was wrong. If the egg (said Aristotle) has the *potential* to be a chicken, it is not an *actual* chicken until it has acquired that which sets it apart from what is *not* chicken. It is upon this basis that Aristotle concluded that *actuality comes before potentiality*--in plain English, the chicken comes before the egg.

Let us assume that Aristotle was right, and that he asks you now: "What came first, this subject or its countersubject?" We might surely reply that the former came *literally first in time*. But this would undoubtedly prompt another question: "What distinguishes this particular melody from all other happy tunes, making of it the subject of this very fugue? Is it not the counterpoint against which it has been set? If this is true, then the essence of our subject is apprehensible only against the backdrop of its countersubject. In combination with any other countersubject, it would have acquired a different essence. My own intuition is that the countersubject existed first (in the compositional process) and the subject was created in contrapuntal response.

This realization came to me in a humbling way. As mentioned earlier, I had wasted many months trying to discern the logic of this subject in relation to itself.

One evening, in frustration, I resolved to set my brain to work on the problem *while sleeping*, that by morning I should have an answer or abandon the expectation that answers could be had. Toward midnight the answer awakened me with a start. Can you imagine what it was?

I had been looking in the wrong place! I had assumed that the subject would explain itself. But I should have been looking to the countersubject! I quickly rose from my bed and went downstairs. There I wrote those pitches of the subject that were in vertical alignment with the beginning of each pitch in the countersubject. They were all intervals of the third or sixth (the inversion of a third). In that moment I realized that the two ideas were inextricably intertwined, each having derived its essence from the other. In both cases, the "it" of itself could not exist without what was *not itself*. They existed in *Gestalt*, their whole being more than the sum of its parts.

I have since given this a great deal more thought, and my conclusions are represented in the "Counterpoint" button to the bottom right. As you move your mouse toward the left, you will be realizing the actuality of this fugue, its essence, as heard in the relationship between subject and countersubject. But as you move toward the right, you'll "realize" the potentiality of it all.

If you've had any experience with music theory, you'll no doubt recognize this continuum as a classic Schenkerian reduction. The most interesting revelation of this approach is seen through the lens of *potentiality versus actuality*. To that end, I've taken the reduction beyond its normal terminus. Ordinarily, it would have stopped with what Schenkerians call the "fundamental structure." But, for our purpose, this structure is itself the actualization of a deeper potentiality contained within the single pitch, A-flat, in consonance with its fourth partial, the pitch C. A-flat is the tone, the thought, the primal idea, that undergirds every actual "thing" that happens in this fugue. These two sounds, in harmony, represent the creation of our subject (from C) and countersubject (from Ab).

Art Is Not a Science

Early in this essay I promised to offer a metaphysical constant that might tie all of these thoughts together. The constant is this: We cannot know what things *are* without equal knowing of what they are *not*. In advancing this theory, I shall point to regions, once more, that may seem to have nothing to do with our simple fugue. But I think otherwise, and will, at the right moment, offer the connection.

For now, let's pick up the story with our salmon and her relationship with tall trees. The uptake of marine nitrogen in the forests of the Pacific Northwest has been described as a "sacred" link or balance. This language fascinates me, not least for its application of such an *unscientific* word to such a *scientific* body of facts. Sacred implies holy, of divine origin, awe inspiring, therefore worthy of reverence and spiritual respect.

In your Internet travels, I'm sure that you've come across the Hubble Ultra Deep Field in 3D. While the facts of this video are stunning, we find them difficult to comprehend. Who can possibly understand "100 billion galaxies, each containing hundreds of billions of stars, as far away as 47 billion light years?" As science advances, we find it ever more difficult to wrap our heads around its

many facts, the body of knowledge being simply too big, and complex. Often our response is confused, as when the narrator says that once we've understood this information, "We cannot help but be forever changed by it." "How," we ask, "ought we be changed?" Should we be terrified (of what), entertained (by what), humbled (by whom), amused, hopeful, mystified, or thankful?

In a feeble attempt to place ourselves in the picture, we say that the universe is "expanding," moving away from us, as if it were a child's balloon that we had filled with helium to release upon the clouds. And when our toy has floated from sight, the concept of "far away" we think we understand. But do we really? While our brains may assimilate the information, we require something else to internalize it, put it into a meaningful perspective, and metabolize it into "soul food" that can make a difference in our lives. We need words like the Lord's answer to Job out of a storm:

Where were you when I laid the earth's foundation? Tell me, if you understand. Who marked off its dimensions? Surely you know! Who stretched a measuring line across it? On what were its footings set, or who laid its cornerstone while the morning stars sang together, and all the angels shouted for joy?

Our tendency to tell the empirical in metaphors reveals something very important about us. It reveals that subjective truth has the power to trump the objective. We like these metaphors because we can relate; they speak to us on the plane that we live. Our experience means far more to us than heady proofs and facts.⁴

The Babylonians, Egyptians, and Greeks did not need a telescope to tell them of their own small place; all they had to do was to look, bare-eyed, to the night sky. At its root, humanistic truth (the artistic, philosophical, and religious) is the fruit of our collective effort to *fathom the unfathomable*--to feel the ineffable--what is beyond the material confines of a test tube, chemical reaction, or physical law. As we search for *that* Truth, we discover *many* competing explanations, most having some degree of evidence, but short of proof positive. At the end of the day, we are left to choose between these claims in a context where science has

⁴ Some social commentators and philosophers have come to this realization, prompting them to declare that we are living in the twilight of the Enlightenment. They would say that ours is the age of "post enlightenment." This trend is of particular relevance to our story because J. S. Bach, who lived at the *beginning* of the Enlightenment, is understood to have resisted many of its assumptions.

Ironically, the triumphalism of Enlightenment thinking is on the wane because of the very advances in science itself. Our new realization of how complex and improbable we are has nudged us toward a painful awareness of our insignificance in the universal scheme. While the current scientific metanarrative says that we are wholly insignificant, we do not believe this about ourselves. The real issue, we sense, is not of our potentiality or improbability, but actuality. Because we are *actual*--because we exist--we wonder why. We marvel, in fact, why. What is our reason, our purpose? Remembering that "to question" and "quest" come of the same root, we have renewed our quest for meaning. Post-Enlightenment can mean many things to many people. But I see, in it, the recollection of traditions and modes of belief that revealed more truth to our ancestors than all that science and technology offer now. For an excellent review of this topic, see Stanley Fish's "God Talk" at <http://fish.blogs.nytimes.com/2009/05/03/god-talk/>.

but little to offer.

It is at this point that we have left the School of Sciences and entered the College of Humanities, Arts, and Letters. Intuition, coupled with our traditions, values, and beliefs, has come into play. In the Schools of Music, Art, Theater, Literature, Philosophy, and Religion, we encounter explanations with power to inspire and change us. Some of us have even stepped across University Avenue into a church or synagogue, where we have sought assurance and peace--ways of understanding the world that might welcome us to the place within, the place of our belonging to, and responsibility for, our communities. In these we discover ourselves, and choose what has the power to move us from where we are to where we *want to be*. In the end, we internalize beliefs that are consistent with our need for purpose and meaning.⁵ Ultimately, we choose what brings us into community with people of like belief.

Science has made great advances and discoveries, to be sure. Many of these have improved our lives, no doubt. To these advances we are both intellectually drawn and grateful. But I suspect that the net of these discoveries has been to intensify our sense of wonder, mystery, and the sacred. Far from explaining what exists, our empirical journey has brought us to the realization that there is simply not enough time for science to explain everything. Nothing short of infinity itself could offer the theories and tools to formulate, test, and model the universe in scientific and mathematical terms.

This does not mean that we should not try, or that we do not derive tremendous satisfaction in trying, or that the comparatively miniscule advances that science will make in the course of human history are futile. Rather, it means that, at the end of the day, every effort to explain all of reality in empirical terms

⁵ There is strain of scholarship within the social sciences that assumes people always act in their self-interest. Those who do not are simply uneducated (with elites knowing better what those interests are, therefore more qualified to decide). This is a typically positivist way of thinking about behavior. The human person is a motherboard of biochemical switches that turn off and on, predictably, in response to stimuli.

More than a hundred years ago, Dostoevsky challenged this assumption (*Notes from Underground*) by suggesting that what makes us human is the desire for *freedom*, not the pursuit of self-interest. This impulse is so powerful, says Dostoevsky, that we often do what is not in our interest in order to feel free. Freedom can permit us to destroy ourselves, or inspire us to perform altruistic acts like falling on a grenade to save a fellow soldier. This impulse is the basis of *agapao*, which lies at the heart of true religion, and diametrically opposite of self-interest.

The positivists "predictably" dismiss the impulse to freedom as but a higher level of self-interest. But Dostoevsky implies that it is precisely the other way around: our sense of personhood, indeed the sensation of "self" itself, requires freedom. Pure sensation of being can exist only in consequence of *freedom* to be.

Either way, what underlie human behaviors are beliefs that inspire attitudes and actions, not scientific facts. While such facts may lead to beliefs, this should not be assumed. Nobody (except the comedian) is motivated to fall on a grenade by the realization that humans are descended from apes. A more beautiful and powerful belief is needed--something like: Each of us was given life for a purpose, to love and take care of fellow beings who, like ourselves, were created for a purpose. The question of that other great fiction writer, Jorge Luiz Borges (from *Three Versions of Judas*), comes to mind: "For who gives himself up to looking for proofs of something he does not believe in or the prediction of which he does not care about?"

will fail.⁶

While there are those, like the Oxford scholar Richard Dawkins, who profess the capacity of science to answer every question, even he has demonstrated faith in underlying assumptions for which he has no evidential basis.⁷ His colleague, Richard Swinburne, has pursued this inconsistency to suggest that the marvelously explanatory power of science, itself, requires explanation.⁸

⁶ While I am as intrigued as anybody about the physicist's quest for a "theory of everything," I am quite sure that such a theory, after it has explained every *material* thing, would miserably flounder on questions like: why is there *something* instead of nothing, what is the *purpose* of our existence and its *meaning*, why is there anything that makes sense, and upon what foundation does that sense rest? In short, rational truth leads ultimately to more questions. The artist would say that such questions are more fruitfully engaged in art, while the theist might claim that their answers come only through revelation, which requires faith.

⁷ Richard Dawkins responded as follows to the Internet Edge Question of 2005: "What do you believe is true even though you cannot prove it?"

I believe that all life, all intelligence, all creativity and all 'design' anywhere in the universe, is the direct or indirect product of Darwinian natural selection. It follows that design comes late in the universe, after a period of Darwinian evolution. Design cannot precede evolution and therefore cannot underlie the universe.

As I understand him, Dawkins has not implied that his assumption is unprovable, but that, without having seen proof, he yet believes it to be true. That, dear reader, is the biblical definition of *faith*. It should concern us, therefore, when Dawkins criticizes the faith of *religious people*, calling it a virus and the "enemy of reason," inveighing against those who do not believe in evolution as "wicked." Even more troubling should be his use of rhetorical and cinematic tricks to mock religious faith in the most contemptuous manner, while, of his own faith, remaining silent.

I think it worthy of notice that Dawkins has faith not just in the *truth of his assumption*, but also in a presupposition that *the assumption itself can be proven true* (which he admits that it has not). It is this presupposition that underlies all scientific investigation: that every phenomenon has a materialistic explanation that is demonstrable within the boundaries of the system itself. In other words, the universe is self-originating and capable of explaining itself.

While we know that the universe can explain many things about itself, perhaps most things, we also know that there exist some universal phenomena that the universe will never be able to explain using what exists within itself as proof. We know this because of Gödel's theorem of incompleteness (see the fugue in *C#*, *WTC 2*). The fact that the underlying premises of science and reason have yet themselves to be shown reasonable and scientific, has led philosophers like Swinburne to conclude that the underlying premise of science itself requires belief without the promise of proof (see fn. 8, below).

⁸ Swinburne's argument is reminiscent of Thomist thought (see fn. 2). Aquinas's "Third Way," offers the "argument of contingency," which posits that everything that contingently exists has a cause of its existence. One ramification of the "cosmological argument," as it has come to be known, is that any given phenomenon cannot establish the coherence and logic of itself (i.e. the self-referential paradox of Gödel's theorem). Swinburne employs this angle to point out (in McGrath's words) "the capacity of science to explain itself requires explanation." McGrath continues (p. 12):

The intelligibility of the universe itself needs explanation. It is therefore not the gaps in our understanding of the world which point to God, but rather the very comprehensibility of scientific and other forms of understanding that requires an explanation. In brief, the argument is that *explicability itself requires explanation*.

Fundamentally, the problem is one of tautology--the inability of a word to define itself. Linguists understand this very well, as do the mathematicians. We require terms outside of the term itself to define the term (in the same sense as we required the countersubject of this fugue to understand its subject).

Because the epistemology of science rests upon observation, its truths require human experience. If a human person has not observed a phenomenon, or its effects, then it cannot be claimed as an empirical certainty. While the scientist can offer theories, these represent assumptions. The philosopher infers, therefore, that the sandbox of science is filled with *a posteriori* truth. By contrast, the metaphysician is interested in *a priori* truth--the hand that filled the box with sand. This type of truth is not deduced, but simply recognized. While a *priori* truth can be reasoned and tested, its logic is inferential, abductive, reflective of the common sense and intuition, a hunch, or what the religious person would call *faith*. One simply recognizes the truth and moves from there. It is *this* truth, argues Swinburne, which empowers the scientific project. In the next section I will suggest that we have more opportunity to glimpse these types of truths in art, tradition, belief, societal membership, mores, and values.

A Human Way of Knowing

The salmon is a fugue of life: in her birth, *exposition*; journey to the sea, *development*; return to her natal stream, *the fugue's final cadence*. No part of her is possible without every other. It seems as if her composition were purposeful, her every act planned and process in its place. As a fugue, her difficult journey inspires us. We admire her courage because this is what we want for ourselves. Uncertain of our own end, we are sad when her life is cut short before her purpose has been achieved. We feel empathy.

Science tells us that this same creature embarks upon her homeward migration without foreknowledge or choice. Unthinkingly, she responds to stimuli--changes in the ambient water temperature, daylight hours and shade, sedimentation, and smells--which return her to the place of her birth. Her behavior has the benefit of perpetuating her species, no more. From it she derives no joy, satisfaction, or pleasure other than sex. Her instincts are automatic--in response to a complex genetic program that came into being, over millions of years, through a process that had no purpose, or even awareness of her existence. While her instinct is to propagate herself, this is not nature's plan. In purely biological language, nature has no plan; it is indifferent, and any talk of "nature's plan" is the language of poets.

For theists like McGrath, that explanation is found in God--the Creator of the universe--the Explainer that stands outside the thing to be explained. McGrath is fond of quoting C. S. Lewis: "I believe in God as I believe in the sun, not because I see it, but because, by its light, I see everything else." But Dawkins is scornful of "God outside the box," insisting that any creator god must itself require a creator. He professes that he himself could believe in god were it shown to have materialistic origin. While Dawkins might seem here to have taken the Thomist idea to its logical conclusion, Aquinas is saying quite the opposite: that an infinite regress of contingencies (Dawkins's position) is irrational. Instead, Aquinas concludes that the possibility of God as "prime mover," infinitely without beginning or cause, and the cause of causality itself (McGrath's position), is not merely rational, but consistent with what we know of the material universe.

To the musicologist, this fugue is a text, begun in the 1720's, which the composer sporadically reworked over the course of the next twenty. It represents one of Bach's first thoughts on the *Well-Tempered Clavier* and one of his last.⁹ Whereas the descending chromatic tetrachord (the lament) in the low voice was old-fashioned in its day, Bach's transformation of the idea, in double counterpoint at the octave followed by the twelfth, demonstrates his mastery of contemporary technique. In this view, the meaning of the fugue is artifactual--a snapshot of compositional practice in Saxony of the 1740's. Its meaning is found in its process, not purpose.

Most musicologists today would maintain, in fact, that Bach's musical purpose is unknowable. Even *if* knowable, it is irrelevant because history, culture, contemporary performances, and audiences, have their own aims, more knowable. While it is true that scholars offer new and valid meanings within the humanities every day, often at odds with the historical, I reject the assumption that these necessarily trump the artist's own view of his work.¹⁰ In particular, I do not accept that Bach's purpose is unknowable or irrelevant. Quite to the contrary, the underlying assumption of music theory is that every musical work of art is the way it is for a reason, and to discern that reason is to discern the composer's intention.

Because we must move on, and because I do not want to be accused of engaging in a straw-man argument here, let me acknowledge that this paragraph is my intuition, and you must weigh it accordingly. I believe that contemporary scholarship in the arts has been unduly swayed by the scientific metanarrative. This metanarrative says that humanistic truth is not quite up to snuff. It is not as "true" as that which lends itself to empirical or propositional capture.¹¹ While this is not the place to develop the criticism fully, one example will suffice. Your love for your child, husband, wife, or lover is true, even though it is rationally, statistically, mathematically, empirically, and scientifically unprovable. Indeed,

⁹ Ledbetter p. 305.

¹⁰ I am not saying here that authorial meanings are authoritative, but that they are often knowable, and represent ways of knowing that are as valid as any other.

¹¹ Michael Polanyi (*Personal Knowledge: Towards a Post Critical Philosophy*) posits that logical positivism (the primary assumption of modern science) represents a way of "telling" explicit information, which he contrasts with "tacit knowing." Polanyi argues that the knowledge base that can be told will always be smaller than that which can be known: "We can know more than we can tell and we can tell nothing without relying on our awareness of things we may not be able to tell." Polanyi's thought, here, is in agreement with Gödel and Turing, the mathematicians.

In a somewhat related observation, Malcolm Gladwell, the author of *The Tipping Point* and *Blink*, suggests that standard IQ tests may not measure intelligence as much as the ability to filter information through a scientific lens. When people of the Kpelle tribe in Liberia were asked for logical groupings of native artifacts, they paired knives with potatoes--a functional grouping. When asked to do it the fool's way, they made the scientifically correct pairings. Gladwell also notes that people of my grandfather's generation did not, as routinely as do we, pair dogs with rabbits (mammals being the scientific connection) because in their experience dogs were used to hunt rabbits. In every culture that has employed them, IQ test scores have risen with each generation of use. Gladwell thinks that this indicates the ascendancy of the scientific paradigm, rather than intelligence.

your loved one will more likely come to know this truth in a poem, bouquet of flowers, or love letter than theorem, equation, or laboratory experiment. When it comes to value, motivation, feeling, purpose, and meaning, the humanistic way of knowing is infinitely more true than anything that science, math, or technology can offer.

Thomas Aquinas tells us that science can know but the lowest plane of our existence, the plane of our material and physical selves. It is therefore inferior to philology, philosophy, religion, art, and metaphysics, which deal with a higher plane. Science cannot process this fugue at any higher level than frequencies, amplitudes, overtones, and the physiological products of their cognition. But, as to the fugue's purpose or meaning, science is impotent. It is impotent because that is not what science does. It has neither the tools, nor the interest.

If you accept this argument, then you might wonder, as do I, what this fugue means. Any search for an answer to that question must take into account the artist's attitude toward his own creation. To ask this question is to assume that the artwork is not meaningless to its creator--a reasonable assumption. It also presumes that the artist's intentions are knowable. What is the work of art itself if not the fruit of the intentionality that brought it into existence? Of every artwork that exists, we can know for certain that a human being intended for it to be. In getting to know that work, we are discovering the intentionality behind its being. That intentionality expresses itself in the author's many choices to make the work one way, and not another. This effort to understand the purpose and meaning of these choices is the foundation of the entire music-theoretical enterprise.

The authorial intention of this fugue is comparatively easy to infer, for Bach has claimed it in a very special way--his signature in tones. In so doing, he gave it a very particular sort of meaning. Bach's claim begins in m. 41, with a pronounced elaboration of the countersubject that extends for a full octave: Ab, G, Gb, F, Fb, Eb, D, Db, C, Cb, Bb, Bbb. The chromatic scale, expressed in the extreme enharmonicism of flats, terminates in a Neapolitan chord on B double flat, an attention-grabbing gesture as ever there was. The expected resolution of the Neapolitan is a rhetorically-turbocharged dominant (beneath a fermata) followed by a cliffhanger rest. In the mirrored scales of the next measure, Bach says, "Pay attention, and I will tell you something interesting about myself in relation to this fugue." Then we hear it, the composer's signature motif--the most pronounced instance of B-A-C-H in the *Well-Tempered Clavier*. In the upward-resolving trill (a humorous gesture?), the composer has winked, letting us know that he has always known what we now know--that he has claimed the work, and its meaning, as his own.

But what is that meaning? It is possible that Bach signed the fugue, as an artist would sign a painting, to say, "I am the one who made this thing." On the other hand, he may have signed it for the same reason that people slap bumper stickers on their cars--to identify with a thought, attitude, or value--claiming it as their own. In view of the fugue's rhetorical bent, either possibility is plausible. Our quest for meaning in this fugue is reasonable because its rhetoric is about communicating a thought, which presupposes both purpose and meaning. What then did Bach mean; what was his purpose?

Let us begin with two facts. First, Bach's students recall that he often quoted Gerhardt Niedt: "The sole purpose of harmony is the glory of God; all other use is but idle jingling of Satan." If you accept this as Bach's purpose, then his harmonization of this lamentable countersubject with such a lively subject was to glorify God. In support of this view, in 1747 Bach composed a canon (BWV 1077) for one of his students in which he wrote, "This is a symbol of Christ, who will crown those who carry his cross." Beneath the canon he added, "By means of these notes J. S. Bach wanted to please God." This canon is of special importance to our study because its leader begins with the very lament of our present countersubject. Upon this basis it seems plausible to infer that the countersubject is the cross, which Christians understand as the emblem of selflessness (dying) for the sake of the other. And, if the countersubject is the cross, then the subject may be the crown of life that is promised to those who carry Christ's cross. Again, you must decide.

What This Fugue Is *Not*

If it is true that we cannot know what things *are* without equal knowing of what they are *not*, it is worth asking what this fugue *is not*. In my estimation, the fugue is *not* ultimately about counterpoint and craftsmanship. Of course Bach has demonstrated superb craftsmanship, revealing himself to have been the master of counterpoint. But to stop there is to imply that the fugue exists to puff up its author (or indulge some private satisfaction of a job well done) when Bach's own testimony disavows the same.

Were we to allow Bach to identify his own purpose, we should begin by acknowledging its source--*a strongly held belief*. It originates in something that is not propositional, but existential and affective. Everything in Bach exists to express an idea to which he was so unalterably committed that, to deny it, would have been to deny his very being. That purpose was to give tonal form to paradoxical truth.

The truth of this fugue is found in its reconciliation of opposites.¹² I suggest that this truth lies behind the Ab major scales in contrary motion that we hear immediately before Bach's name. The conceptual framework of this truth is expressed in the German word, *die Umkehrung*, which can mean many things depending on its context. In music it represents inversion, but in everyday speech it means to change direction or to go the other way. Theologically, it can be used to express the ideas of repentance and conversion. For Bach, musical counterpoint was the material plane upon which the theological implications of *die Umkehrung* could be materialized in a form that ordinary people could hear and understand. The overriding thought of this fugue (and Bach's motto) is that one gains his life by dying to self. The purpose of this dying is to love the other,

¹² In theological terms, the thought of this fugue is that death and life are inseparable, the Biblical expression of which is found the life/death tensions of Romans 6:1-12. We discover a similar thought in the philosophy of *antinomy*, first proposed by Augustine, and developed by Bach's near contemporary, Immanuel Kant. Since one cannot prove the reality of God, freedom, and immortality through "pure reason," Kant concluded that these must be assumed if one is to find purpose and meaning in anything.

and thereby to regain the true self. Without love there is only ego, which is mortal. But with love there is eternal life.

Which returns us to our Chinook, and her dying for the sake of her kind and others not of her kind. To the religious person like J. S. Bach, every living creature, including the insouciant fish, was a reminder that the Creator not only loves and provides for creation, but is *with* that creature, even in its dying. When the sage prophet wanted to make this point he gave his fishermen the nod to cast their nets on the wrong side of the boat, whereafter they were filled to the point of tearing.¹³ And to demonstrate his care for the little thing, the hairs, he said, of our heads, are numbered, just as is the fledgling sparrow that falls from its nest.

In the presence of this type of knowing, one might even begin to believe that the Creator is with the Chinook even as she is caught in the clutches of the eagle, or jaws of the bear, and her life's blood spilt upon the rocks. The losing of her life to save it, and for the sake of her children, becomes the picture of love, and of the purpose that we ourselves are given.

Which of the competing visions in this essay, which ways of knowing, have the power to transform society? Which vision inspires you? Which has the power to make a difference in your life? Which might help you to become a better friend, student, teacher, husband, mother, daughter, driver on the freeway, citizen and neighbor, boss? Which vision sees in this fugue more than process and technique, but the tonal analogue of meaningful and purposeful relationships of every kind--tones, ecosystems, galaxies, melodies and beliefs? You, of course, are the only one who can decide. But, in making this decision, consider one last story.

A Personal Reflection

Søren Kierkegaard, the Danish philosopher, once resolved to read only those books whose authors had died for what they believed. If a person held so strongly to his belief, he thought, then it could be trusted.

This is an interesting approach, but we have only to read the daily news to see that it doesn't always work. Here we discover tragic people who forsake their lives for sadly mistaken beliefs. Kierkegaard was therefore wrong on this count, albeit with a kernel of truth in his resolve. It is just that one must take a closer look at the belief itself. It is one thing to respect the man who throws himself on the track to save a child, but quite another to respect his belief that God will, in consequence of his good intentions, halt the train. Not to belabor the point, it is yet another to respect the belief of a man who blows up the train, killing himself and the many children aboard, to avenge that grudge to which innocence was not a party.

In observing that Bach's fugal purpose begins with belief, I am not attempting

¹³ The net that catches the fish is the instrument of God's provision for human need. At the same time, it prefigures the manner of Peter's death--he will be led to a place that he does not want to go. In that premonition there remains the "net" of God's presence, foreknowledge, and love.

to validate the belief.¹⁴ I am saying, rather, that faith is a human way of understanding and knowing the world, and a powerful motivator of thoughts and actions. It can inspire us to beauty and altruism, or delude us into the doing of depraved and wicked things. That said, all of us operate on the plane of beliefs, even they who "believe" that reason is the final arbiter of truth. Upon what basis do they know that reason itself is reasonable? Faith? As we have observed, the foundational assumption of science itself, that matter and energy comprise the only possible explanation of matter and energy, is a creedal proposition.

While in Scotland this summer I read the prolific Scottish historian, Thomas Carlyle. In his Inaugural Address at Edinburgh University, Carlyle observed that it is impossible to write a book without losing a bit of one's health. It occurred to me that Carlyle was saying something akin to Kierkegaard. To believe so strongly in an idea that one would sacrifice his health to bring it into being, is another way of dying for what one believes. If this is true, then *every* artist--every *serious* artist that is--dies a little in the making of every work of art.

The question that I shall leave you with is this: Do you think that the composer, sculptor, novelist, painter, poet, or playwright dies for the sake of that which has no purpose or meaning? Even such art as exists to proclaim a meaningless and purposeless existence is, by its very existence, proclaiming its own purpose and meaning. Accordingly, while individual works of art may declare a nihilistic attitude, the mere fact that they exist, and particularly that someone brought them into existence, reveals the opposite.

My purpose in writing this essay has not been to espouse knowledge that comes of faith or belief as superior to the empirical. It has been, rather, to suggest that *all* knowledge, all truth, even the scientific and mathematical, proceeds from underlying beliefs. The challenge is to calibrate the belief by determining if it moves us to selflessness. Does it inspire us to love and care for nature and our fellow creatures, or does it lead to environmental ruin and the destruction of life? Does the belief devalue our human experience or ennoble it? Does it give purpose to our lives, or demand that we devise our own, else live without? Does the belief produce beautiful works of art and respect for our common heritage?

All knowledge, whatever the source, is our *actuality*. Our actuality includes ourselves, our very being. Our actuality is existential; it depends upon our bodies and our breath--our *being in relationship* with the world. This is the part of us that purposes to do a thing, and does it. Our actuality is the waterfall that must be leapt, and the dodging of the eagle's talons. It is our foreground, our subject and

¹⁴ Many times in this study I have alluded to Bach's motto, *Christus coronabit crucigeros* -- "Christ will crown those who carry his cross (see BWV 1077). This phrase expresses the core belief of Bach's faith, what Martin Luther called *Theologia Crucis*, or "theology of the cross." The paradox of this belief is that it requires one to hold seemingly contradictory thoughts in careful tension with each other: "Then Jesus said to his disciples, "If anyone would come after me, he must deny himself and take up his cross and follow me. For whoever wants to save his life will lose it, but whoever loses his life for me will find it." (Matthew 16:24-25.)

countersubject, and all that we know of the same. It is our epistemological self -- the part of us that we can know to be known.

Behind this actualization is our potentiality--our ontological selves--which is the pure sensation of being. Our potentiality transcends our physical selves, existing in our common heritage of thought and idea. This part includes what we cannot *know* to be known, but about which we have powerful beliefs and aspirations nonetheless. In this part we perceive purposes that are *not* of our own creation--purposes that imbue the world with meaning. Our potentiality is the soul that senses whence it came, and why, and where it goes. This part derives comfort in knowing that we continue to exist after we die--whether as isotopes of nitrogen in tall trees or in the presence of our Creator. Our potentiality is the natal stream and hope of the placid pool above the jagged rocks. Beyond the biological impulse to survive, our potentiality is to continue being, because this is what we were meant to be--to run the gauntlet of bears, out swim the sea lions, leap the confines of the trawler's purse seine, and flip ourselves free of the fishing wheel. This is our fundamental structure and harmonic series; it is our centering pitch around which everything else reverberates and harmonizes.