

Science and the Poetic Imagination

Lyndon LaRouche: The subject today¹ is an extremely important one, under modest circumstances. It often happens that way, that some of the most important things happen under modest circumstances—or, ostensibly modest circumstances, which soon turn out to be something quite different than modest. And that’s the way it should be today.

There’s a piece I’ve written, called “Our Universe Beyond,” which pertains to the fact that we have to now begin to understand that Earth is merely a part of the Solar System, and the Solar System is merely part of the galactic system, and these systems are so intertwined, that there is no integral separation of them from each other. We’re now going into a point where a few billion years from now, the Sun will have been no more, and the Solar System will obviously be gone, too; the galaxy will probably persist. And we, as human beings, or whatever remains of us, or whatever our consequences are, will probably be part of that galaxy.

But where will man be? Well, man will probably be under, if we’re fortunate, completely new circumstances, much more intelligent than we’ve been recently, and playing a different role in the universe than we were playing before. But hopefully, we shall have that consequence, and our consequence, then, is a part of the meaning of our life, now.

We had a gentleman, Wilhelm Furtwängler, who had some insight into this, who’s known as a great musician, and he had an accurate insight into the general idea of this principle and this perspective. So what we shall do today, is we shall have a report from my associate here [Matthew Ogden], who will report on the great achievement which this great man made, and this gentleman [Jason Ross] shall respond to this, and I shall respond to it, and we shall have a discussion.

So, anchors away!

A Musician and a Scientist

Matthew Ogden: Good. So, if people have been

1. The video is at <http://larouchepac.com/node/22946>.

watching, over recent weeks we’ve had a lot of fun here, and we’ve revealed something that has been a secret for far too long: that the great conductor and musician, and composer in his own right, Wilhelm Furtwängler, was much, much more than what he is normally perceived as being. He is a great musician, indeed; there’s no doubt about that. But *we* revealed him as being much more than anybody has previously acknowledged him to be, with a far greater significance than most people even recognize. We’ve revealed that this great conductor was a uniquely significant figure in the history of scientific discovery, on a par, I’d say, with several of the greatest scientific minds in the history of human civilization, and somebody whose own, uniquely demonstrated discovery of universal principle, actually allows us, now, to touch what still remain as the frontiers of physical science, to plumb the depths of the unanswered questions that remain before us, regarding, what is man, and regarding man’s relationship to the universe as such. And in fact, I’d even assert that Furtwängler’s scientific insight goes even further than that, and has immense implications for a domain that we could class as the theological.

Now, what I’d like to focus on here, in terms of overall subject-matter, is really the same question that we’ve been addressing in recent weeks, but this time in a slightly more specific form, informed by what we have presented here previously. The way the question can be asked is, how can we know the future, before that future has been experienced? Can we know the future, before that future has become the past? Or maybe to ask it in a slightly different way, but the same question: Can the mind escape the bonds of physical sense-experience?

Shelley: The Future Moves the Present

For the sake of surprise, actually, I’d like to introduce a new voice into our dialogue here, today: I’d like to continue to explore the Furtwängler Principle, but for a moment, I’d like to look at Furtwängler through the eyes of another unacknowledged physical scientist: the poet Percy Shelley.

Now, Shelley was a great poet, as Furtwängler was a great musician, and he’s been recognized as such. But he was not only that. And again, going far beyond the domain of what people normally perceive as art, and artistic principles, Shelley was no mere “weaver of words,” no mere poet in that sense, but as we’ve dem-

onstrated with Furtwängler, Shelley's, also, was a mind on a par with some of history's greatest scientists. And Shelley's insight is one that penetrated the very depths of some of the most significant ontological principles that lie at the root of the universe, and man's relationship to the universe.

Now, Lyn has repeatedly emphasized the importance of Shelley's *A Defence of Poetry*, and the closing paragraph of that essay is something which is often quoted, but which is very rarely understood. Why is that? Reductionism. The same reason why Furtwängler's music is admired, but is not understood. Reductionism will tell you that time extends linearly, from the past to the future, from backwards to forwards. That the future is somehow the fruit of the "now"; that tomorrow is merely the extrapolation of today. And that every moment follows moment after moment, as cause leads to effect, so-called.

But what does Shelley say? At the end of the *Defence of Poetry*, he makes the point that real human history, especially in extraordinary moments, is never such that the elements which exist in the now, are something which logically lead to what will happen in the future. But rather, it goes the other way around: that the future is that which is constantly taking the present by surprise! The future awakens an effect in the present, that that present's past did not contain, in and of itself. And the individuals who exist in that present, will find themselves startled, will find themselves taken by surprise, as they're suddenly compelled to action that did not occur to them previous to that point, under the influence of a power which did not exist for them in their past, "moved by a spirit," he says, that didn't originate, in a sense, from inside them.

So, Shelley says, the future has a power to move the now, an impulse to action which didn't exist in any form in the experience of the present or in the experience of the past, outside of the bounds of sense-experience. And in this way, it's the future which gives birth to the present, rather than the present somehow creating that future. Shelley calls it "an unapprehended inspiration" which moves the soul, or "the gigantic shadows which futurity casts upon the present."

This statement by Shelley completely violates everything that we're taught about physics, all reductionism, all bottom-up ideas about the physical universe, all ideas that you just put together elementary particles, elementary building blocks which then create the bigger object or the next moment in time. Because the reduc-



Percy Bysshe Shelley (1792-1822). His work, said Matthew Ogden, "resonates with everything that we've explored over the last two weeks, in regards to the Furtwängler Principle in music."

tionist would say, "Well, if the future does not yet exist, how can the future create the present?"

But, does the future really not exist? Or, is it merely, yet to enter the domain of physical sensation?

I think people can probably now get a smell of how this question that we're approaching through the eyes of Shelley, now resonates with everything that we've explored over the last two weeks, in regards to the Furtwängler Principle in music.

To recapitulate, as Furtwängler asked, in very precise, scientific terms: If the unity of the whole has to always be that which determines the behavior of the individual parts, where—and when—does that whole exist, relative to the present moment? And, if every moment of a performed composition, say, is merely the subordinate shadow of a higher and more dominant substance, where, if not in any of the temporal moments as such, can we look, to find that unity of substance?

Now, I don't think it's surprising, but people might not have looked far enough; actually, the beginnings of the answer to that question, lie right there in Shelley's

essay. In the very opening paragraph of the *Defence of Poetry*, Shelley identifies exactly this very rigorous scientific question. He says: Look, there are two different, distinct types of mind. You've got two classes of mental action. On the one hand, you've got what he calls "reason," but on the other hand, you've got "imagination." And he defines them successively. He says reason is the contemplation of what already exists. But imagination is the creation of something new. Reason is that which is concerned with objects, and with their synthesis into larger objects. But imagination is that which contemplates the intervals between things, understands relations as such.

He says, "Reason is the enumeration of qualities already known; imagination is the perception of the value of those qualities, both separately and as a whole." And he concludes this opening, saying, "Reason is to imagination as the instrument to the agent, as the body to the spirit, as the shadow to the substance. Poetry, in a general sense, may be defined as 'the expression of the imagination. . . .'"

And now, what does this allow the poet to do, that the mere deductionist can not? Shelley says, if the deductionist is only concerned with what happens in the moment, with what already exists, then in no way can the deductionist—he who relies on pure deduction—see what will come to exist in the future; he who is only concerned with the "enumeration of quantities already known." But the poet "beholds intensely the present as it is and discovers those laws according to which present things ought to be ordered, but he beholds the future in the present. . . ."

And so, all of a sudden, we've discovered that we've uncovered a state of mind, which, if it does not exist for the scientist, the scientist *is* no scientist. But the poet, or the artist, or the musician, in Furtwängler's sense, or in Max Planck's sense or in Albert Einstein's sense, is he who is able to see the real domain of substance which lies beyond the shadowland of sense-experience. The poet sees the substance of the future, which is what's casting the shadows onto the present, and in this way,



A drawing of a Grecian urn by John Keats (1795-1821). Keats's "Ode on a Grecian Urn" invokes the relationship between the "heard melodies" of the senses and the "unheard melodies" of the spirit, that which allows us to step from the temporal into the eternal. The Furtwängler Principle!

Shelley says that the poet can, indeed, foretell the spirit of the future, if not maybe the form, which would be superstition or prophecy.

But it all comes out of the ability to escape the prison walls of sense-perception, to escape the reductionism of mere experience of the present and the past, but to carry the imagination outside of sense-experience as such. And this is what Shelley identifies directly, and it speaks to exactly what we discovered is at the root of the Furtwängler Principle, also. Shelley says the poet, uniquely, has the power to participate "in the eternal, the infinite, and the one; as far as relates to his conceptions, time and place and number are not."

A very good example of this, something which Lyn has also brought up repeatedly, is something you can

find from a very close friend of Percy Shelley, and a collaborator of his, John Keats. If you just think for a moment about the example of the "Ode on a Grecian Urn": that this moment of frozen time actually has the ability, as Keats says, to tease us *out* of time, that we can escape the bounds of chronological time, as experienced, through the shadow which we find of the substance which is cast onto the present moment, that this "doth tease us out of thought, as doth eternity."

And Keats has a very beautiful way of saying what we have discovered as being at the root of Furtwängler's principle, also: that the relationship between the heard melodies of the sensual ear, and the unheard melodies, the spirit melodies of no tone, is what allows us to step from the temporal into the eternal . . . and suddenly, we're back at the Furtwängler Principle. You have the relationship, as Furtwängler described it, between what's "near at hand" and what's "far away," the near and far. The relationship between the moment and the eternal, the parts and the universal, the dominant whole, or the shadow and the substance.

Menuhin, Philo: A Theological Principle

And I think this is what you recognize, in terms of what echoes so loudly behind the notes and between the notes, of Furtwängler's conducting. This was recognized—just for fun—by Yehudi Menuhin, who was a very close friend, and also defender of Furtwängler, when Furtwängler was under attack by the CCF [Congress for Cultural Freedom], by the people who Menuhin identified as the “real Nazis,” they who appeased the Nazis for so many years before we opened the Western Front.

Menuhin said about Furtwängler: “There are many conductors, but very few of them seem to reveal that secret chapel that lies at the very heart of all masterpieces. Beyond the notes, there are visions, and beyond those visions, there is this invisible and silent chapel, where an inner music plays, the music of our soul, whose echoes are but pale shadows. That was the genius of Furtwängler, because he approached every work like a pilgrim who strives to experience this state of being that reminds us of Creation, the mystery which is at the heart of every cell. With his fluid hand movements, so full of meaning, he took his orchestras and his soloists to this sacred place.”

As I said in the beginning, the Furtwängler Principle extends far beyond music and mere art. It extends even far beyond just scientific principle as we know it; but what it tells us about man's relationship to the universe, and the ongoing, living process of creation of the universe as a whole, and what man takes part in, reaches to the point of actual theological implications.

What we're going to explore in the rest of the discussion here, is something which we have touched on in previous shows. We've taken what Leibniz had said, for example, where you realize that within this shadowland of



Furtwängler (left) and his friend the violinist Yehudi Menuhin, in 1952. Menuhin said about Furtwängler: “There are many conductors, but very few of them seem to reveal that secret chapel that lies at the very heart of all masterpieces. Beyond the notes, there are visions, and beyond those visions, there is this invisible and silent chapel, where an inner music plays, the music of our soul, whose echoes are but pale shadows.”

mere experience, what the reductionist would understand as just an endless series of nows—now, now, now, now—can not contain within it the cause of the being of those moments. That sufficient reason, the active cause for those parts, can not exist in the aggregation of those parts. So we have to look outside of that, look beyond, look behind the shadowland.

Another figure, who also addresses this, maybe somebody we could call the “Leibniz of the early Christian era,” Philo Judeaus of Alexandria, who also vividly understands this as a theological principle, that if the active reason, if the cause of something must come from outside of the thing as such, then at no point can the future be born out of the present, but it has to be always created as something new.

And it's this continuous process of creation in motion, which is a vividly living principle for Furtwängler. And in fact, Furtwängler was insistent, that the death of the music comes when you enter the

domain of routine, that there can be no mere replication, that there can be no mere repetition, that it's always a fresh and new process of creation, and the conductor must have the personality of an always-living creator, a creator who's always alive.

Economic Forecasting

LaRouche: Now, just a comment on this, at this point, as an interlude: I have been forecasting economic processes for a long time—actually, since the 1950s—and I have been, in forecasting, not always delivering a precise forecast, but in my forecasting I've always been right, and everybody else has always been wrong. There's a very simple reason for this: that the human mind, creative mind, is quite different than the ritual mind. And all of us have, within us, as born people, the

possibility of creativity, expressing it, that is, actually seeing the potential of the future. You can not really see the future as such; what you can see is the potential on which people can act, and that's the best you can do. At least the best I can do.

I've always been right, and they've always been wrong. Why? Because they always depend upon a literal conclusion of deduction. They come up with a complicated deduction, or a not so complicated deduction, or simply a fraud, just simply out of the air, belief out of the air, a wild wish. "Oh! This is going to work!" or, "No! That's not going to work!" sort of thing. But I've always been right, in these terms of reference.

We live in a post-Roosevelt society; Franklin Roosevelt was the last real leader of the United States who really had a sense of the future, that is an active, effective sense of the future. And that's what I have. And that's what I do.

And the problem I've seen, and every time I've run into a forecast, where I've made a forecast, and others have made a forecast, and where they've always been wrong, and I've always been right, is the fact that I believe in the future. The problem with most people is they don't believe in the future. They don't understand it. They believe in the deductive view of reality; they take the things that exist now, and try to find a deductive solution, or deductive prediction that's going to flow from these factors. And in all major forecasting that I've known in the postwar period, since the death of Roosevelt, every one of these forecasters has been *wrong* on these issues. And I, in my own modest way, and I do mean modest way, have always been right.

Because you never really know all of the future. What you know is what is wrong about the conclusions concerning the present, at best. And that's exactly what you've been discussing, exactly this, this poetic principle. We have, as human beings, the ability, to forecast things that don't arise out of deduction, deductive processes. Most people are trained *not* to do that. They say, "That's a baddie, you're not in the game, you're not playing by the rules." And that's the nature of the problem.

My joy has always been to have the power of imagination. I have a creative imagination, I know what it means in Furtwängler's sense of the imagination, also, and that's what we require. Most people will never be able to save humanity from disaster, because they will always reject the insight into the future. They will always try to find a practical, deductive explanation of the present, and impose that on the sense of the future.

We have now entered a period in which the entire human species is in danger of destruction by its own stupidity, its own rejection of understanding the meaning of the future, of seeing the future. And I know *exactly* how the minds of these people work. I know *exactly* how the minds of all these economists who do forecasting work. They're all incompetent, they're always wrong on these kinds of issues. They're always wrong. And they're stubbornly wrong, because they believe there are *rules* which they must obey, obedience to custom. "Well, that's not customary, that's not the way our people think. You're saying something that most of us don't agree with." But that's why I'm right, because I reject their assumptions.

And that's exactly what you're expressing. That's exactly what Shelley is expressing. And we have lot more to say on this, but I just wanted to interpolate that. That's the issue. The issue is the human mind, as is exemplified by our hero today, what most people just lack: a sense of the future. They lack a sense of the future; it's not something that's mechanically produced by the past. But the future is something which the creative powers of the mind, in particular, in society, can create: a future which would otherwise *not happen*, except for the intervention of the creative powers of the mind. And that's what's at issue here.

If you want to survive, if you wish to exist, if you wish this nation to continue to exist, if you wish this planet to exist through this particular type of crisis we face now, you have to learn the song of the future, which is something that most leaders today, in society, do not know. That is why they're intrinsically incompetent. That's why their leadership intrinsically tends to lead toward the destruction of mankind and civilization, because of their very ego, their pride, in saying they're "practical people." And the practical man is the greatest traitor to humanity that was ever invented.

Discovery: Beyond the Senses

Jason Ross: The concept of "future," itself—I was just thinking during the discussion, that people often think of it as a thing, like a noun, but really, when we're acting on it, it's a verb, or it's certainly a result of action. It isn't a *thing* that exists out there. Even the concept of "the future" can be troublesome sometimes, because there isn't "a" future already, outside of what we do. And indeed, different people's ability to conceptualize the future, if you're a creative thinker, the way Furtwängler was or Shelley was, you're able to create an



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Jason Ross: “Music is going to be an essential aspect of getting a real idea of what a discovery is, to bring science really forward now.”

experience, a new future, that no one was capable of even imagining before, because you’ve got a new degree of freedom, you might say, you’ve got a new path for creative thought that lets you think differently.

What I want to address is how communication works, and how discovery works, or education, rather, because it’s really all the same thing, and it gets at this going beyond the senses. So, if you go back, quite some time, to Aristotle, or we’ve been talking about Euclid, but with either of these two guys, you’ve got a fixed world system, that basically, everything’s done, and future discoveries aren’t really there, so much. At least nothing revolutionary.

If you read the works of Aristotle, they’re kind of boring, because they’re so declamatory. Aristotle says, “This is how things are, you know, slavery is the right way to go, because some people are meant to be slaves and some aren’t. This is how physics works,” etc. There’s no germ of discovery in it, it’s just sort of “Here are the way things are,” and it’s all very external. The same with Euclid. Rather than the product of discoveries, what he presents is sort of an external world of geometry, the way Aristotle presents an external world, which we might discover more about, but from which the mind itself is abstracted.

Now, contrast that with—you mentioned Philo; I

wanted to read a quote from Philo, or Socrates. Here’s Philo, in his work *On the Creation*: “For some men, admiring the world itself rather than the Creator of the world, have represented it as existing without any maker, and eternal; and as impiously and falsely have represented God as existing in a state of complete inactivity, while it would have been right on the other hand to marvel at the might of God as the creator and father of all, and to admire the world in a degree not exceeding the bounds of moderation.

“But Moses . . . was well aware that it is indispensable that in all existing things there must be an active cause, and a passive subject; and that the active cause is the intellect of the universe, thoroughly unadulterated and thoroughly unmixed, superior to virtue and superior to science, superior even to abstract good or abstract beauty; while the passive subject is something inanimate and incapable of motion by any intrinsic power of its own, but having been set in motion, and fashioned, and endowed with life by the intellect, became transformed into that most perfect work, this world.”

Now, sometimes it’s difficult, bringing up the “God”-word, because people have got a lot of different ideas of what’s behind that, and I’ll let what he said stand for itself.

But take a look also at Socrates, at the way he communicated things. We discussed *The Republic* last time, but in all of Plato’s dialogues of Socrates, the point is often not the conclusions that are reached, but rather *the way* conclusions are reached, the means of discovery itself. And so, in one of them, in the *Alcibiades*, Socrates is making fun of this guy Alcibiades, who thinks he knows everything, and Socrates points out that usually when you come to discover something, you discover it after you didn’t know it. And he’s sort of probing Alcibiades to see when he didn’t think he already knew everything, and Alcibiades really can’t think of a time when he didn’t think he already knew everything; and Socrates points out: Well, if your thoughts aren’t the fruit of a discovery that you can identify, then really, what value are they? How are you certain that they’re true, if you didn’t come to them by overthrowing some other thought, or as a necessary idea, or something like this? It’s just sort of a conclusion that you have, that you got from somewhere, that didn’t really come from your own mind.

Kepler vs. the Empiricists

Now, jump forward a couple thousand years. If you look at the [15th-Century] Renaissance, if you take a

look at a map of population in the world, specifically in Europe, after the Renaissance, population just—*whew!*—it just takes off. Something happened to the human species. If you're looking at us in biological terms, you would say, "Something happened to the human species during this period. All of a sudden the human population is exploding! What happened?" And it wasn't that the climate was very nice, and there was a lot more food available, or people just had more kids or anything like that, you know—they were all Catholics, so they were against birth control. That has nothing to do with it.

The fact is, that the scientific discoveries people made, let us change our relationship to nature, and this was attacked. So now, let's compare the attack on the Renaissance, with Kepler.

Take for example, Fludd, Descartes, Galileo, Newton, Bacon, Voltaire—all these people, some of them more than others, were supposedly scientists. Francis Bacon wrote this great big treatise on how science ought to be practiced, although he didn't discover anything himself. These people aren't scientists though; they're political actors. These people get used, just like today.

You know in academia, you go to an economics department—maybe some people there are unaware of it, but I think if you look at people in the know, these departments are political departments, they're not really scientific departments. Economics is a political goal, and then you have to come up with theories after the fact to support it; in large part that is what happens.

So what all these empiricists said is that we come to knowledge through our senses. And unlike Aristotle or Euclid, they said, "Yes, it's possible there might be more to discover, we don't know everything yet. Obviously, the Renaissance has shown us that. But," they say, "hold on. As to *the way* we discover things, we're done! We've figured that all out, so we can tell you how all discoveries are made." Like Bacon, writing a book about discoveries that he didn't make.

And they said that the basic key is induction. They got a breakthrough: Instead of starting from assumptions and hypotheses, and then coming to conclusions, why don't you start by making observations?

Okay, so you make observations, and then you find some way of generalizing them, and making a general statement that would include all of your observations. Now, that general statement is expressed in terms of observations. It's expressed in terms of what will one see, how will this process respond, etc. It never gets at

a "why?" It never gets at physics, it never gets at power. It's not creative.

In contrast to that, take Kepler. Now here's something that Kepler wrote—remember the earlier distinction with Aristotle or Euclid, where the mind wasn't part of the discoveries; they existed on their own, and the mind was sort of written out? Here's Kepler in one of the introductions to his *Astronomia Nova*, his *New Astronomy*. He wrote:

"In what follows, the reader should overlook my credulity, since I am judging everything by my own wits. Indeed, the occasions by which people come to understand celestial things seem to me not much less marvelous than the nature of the celestial things themselves. I therefore display these occasions scrupulously, with, no doubt, some attendant difficulty for the reader. Nonetheless, that victory is sweeter that was born in danger, and the Sun emerges from the clouds with redoubled splendor. Therefore, O reader, pay heed to the dangers of our army, and contemplate the clouds, horrifying in their darkness. Contemplate, I say, for beyond these clouds the Sun of truth truly lies hidden, and shortly will emerge."

So, Kepler is saying here that the way we come to understand things is "not less marvelous" than those things themselves. The mind, and how it works, is "not less marvelous" than the planets. And this is from *the* foremost astronomer, ever, in his time. What did Kepler do? He completely threw away this whole empirical model. He, in fact, did it very explicitly with his vicarious hypothesis. He said: "Okay, let's play your game: Let's make a bunch of observations"—and he did a better job than anyone else. "Let's make a model that would include all of these observations." So he makes a model and includes all the observations. And he shows that that model disagrees with itself.

He just says, "Look, we tried this out, we tried the models that everyone else was using. We got circular motion, or at least the equi-angular circular motion. We've got these planets, etc., and the model disagreed with itself." This vicarious hypothesis had an internal contradiction.

Kepler was able to adjust it to get the right results, and a lesser astronomer might have stopped there, might have said: "Look, whatever, we can get the right observations with this model. Who cares if there's some problems on the inside?" Here's what Kepler says—he says, "No!" regarding his adjusted model: "Even considering the longitude alone, the lack of any perceptible

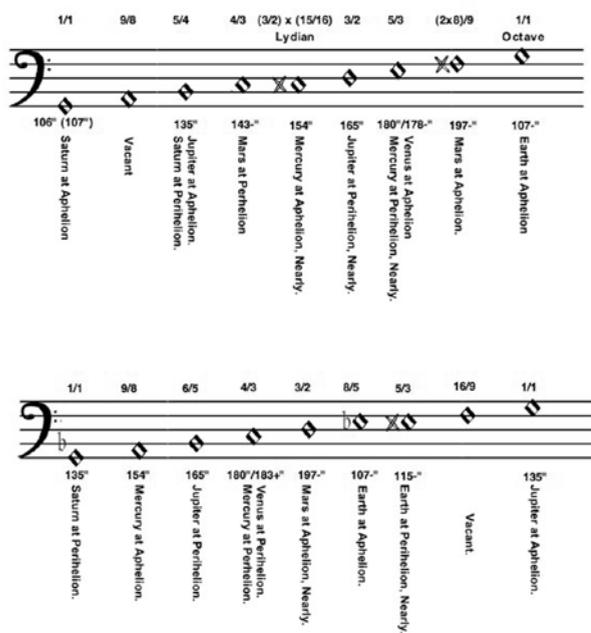
FIGURE 1
Kepler's Harmonies



Johannes Kepler (1571-1630), by insisting on the principle of causality (rejected by the reductionists then and now) gave modern science its first practicable, scientific conception of the astronomical universe. In his *Harmony of the World*, he extended the question “Why so, and not otherwise?” to the whole planetary system, showing that the conflicting evidence of the senses can only be resolved on a higher plane.

The drawing (left) is from the frontispiece to Kepler's 1627 *Rudolphine Tables*. It shows the astronomers Copernicus and Tycho Brahe at the center, while Hipparchus and Ptolemy look on. On the base, the panel to the left shows Kepler himself, laboring by candlelight.

The musical scales shown below are illustrations from Kepler's *Harmony of the World*, showing the “tonalities” of the harmonic orbits of the planets. Above is the major scale, below the minor scale.



difference in effects, between the as yet unknown true hypothesis, and the false one assumed by us, the vicarious hypothesis, does not make the effect identical. For there can be a small discrepancy which the senses do not perceive.”

Now, hang onto that: He's saying that even if you make a model that matches the observations perfectly, that matched the data perfectly, that in itself would not be sufficient to say that your model was right. Kepler said, no, you've got to look to causes. If you can't answer “why so, rather than otherwise”—like the method of Socrates: Was it a discovery, Alcibiades? Did it have to be that way, instead of another way? Kepler is saying, unless you can say why it had to be this way instead of some other way, unless you're answering a question, what you're getting couldn't possibly be the real truth.

You think about how he used that, in his *Harmony of the World*: It's similar to looking at a future that doesn't yet exist. He looked at the planets, and he looked at going beyond what he

had done in his *New Astronomy*, where he understood the relationship of two planets with the Sun; he only used the Sun, Earth, and Mars in that whole book.

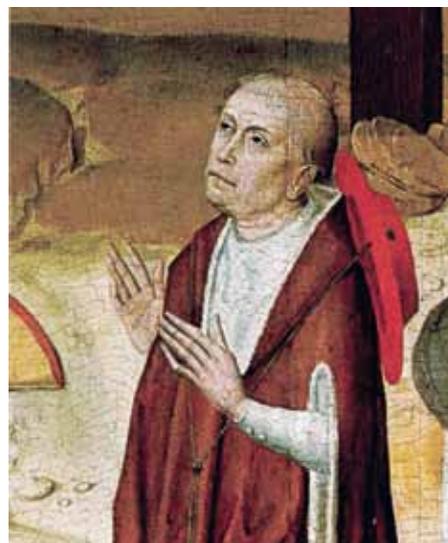
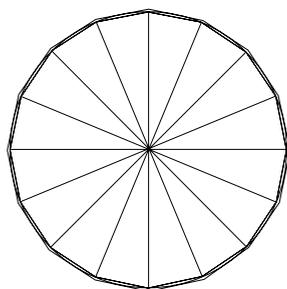
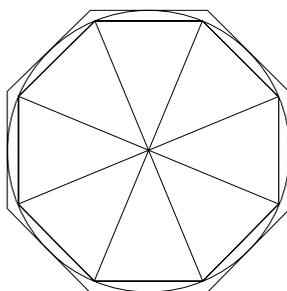
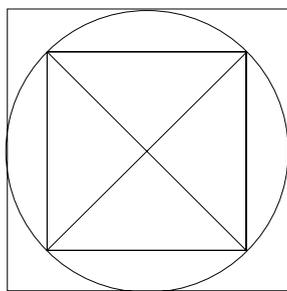
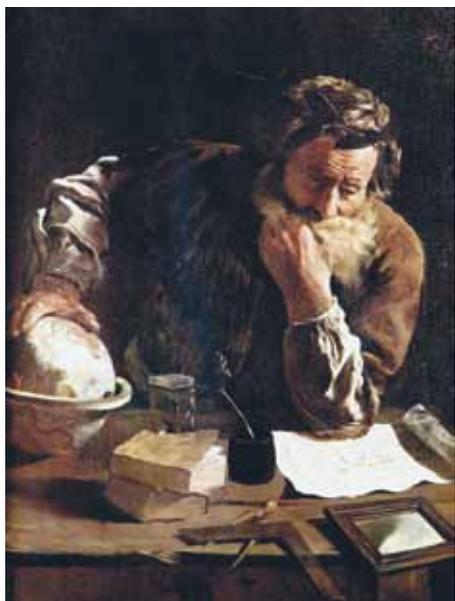
In the *Harmony of the World*, he extends this question, “Why so, and not otherwise?” to the whole planetary system. And the answer that he arrives at, is that a harmonic system is set up, that both the major and the minor modes are required. He goes through the whole thing; but one of the important things, is that the harmonies that determine the system don't exist in the data themselves anywhere; that the harmonies Kepler finds are not in the motions of the planets; they're not in the speeds of the planets; they're not in the distances of the planets. They're in the *perceived speeds of the planets, as the Sun would see them*. And understood, through the sense of hearing. Which is the Sun is seeing.

So, without this whole, without the Sun as “conductor” so to speak, you aren't able to have the harmonies that he discovers in that work.

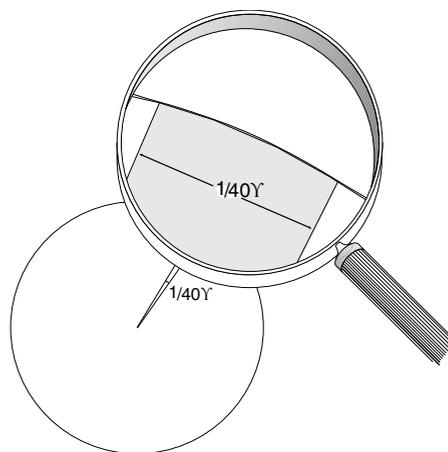
The Infinitesimal

Just to finish up, I'd say there are a couple aspects on music that are very relevant today. One of them is what

FIGURE 2
Quadrature of the Circle



Nicholas of Cusa (right) showed that Archimedes' (left) attempt at quadrature of the circle—to approximate the value of pi—was ontologically incompetent. The first three drawings show the process of estimating the area of a square approximately equal to that of a given circle, as the average area of two regular polygons. In the last drawing, although the inscribed polygon may seem to closely approximate a circle in area, it actually contains a devastating paradox. The more the polygon looks like a circle, the larger is the number of its sides—i.e., the less it partakes of circularity.



Kepler had done: You've got a certain continuity that underlies all the experiences, you've got the thing that drives all the "nows" that then follow. And you've also got a sense of how you break one of those continuities, one of those wholes, to arrive at a higher one.

You take a look at music today: What Kepler was saying, again, about how a difference that's imperceptible doesn't make things identical—you can have someone who even attempts to imitate, say, a Furtwängler, or somebody who attempts to imitate an actor; they're playing in a play and they're imitating the way another actor acts. Sometimes, even if it's very difficult to tell quite what's different at every node, or every passage or every word, you still know that something just

isn't there. And often, just as an aside, with acting this comes up as sort of using a broad brush to paint a scene. So you say, "I don't know what that guy was saying, but I know he was angry." As opposed to letting the words actually speak for themselves.

But this difference, the size of this difference, you really have to say, is infinitely small, because the difference between a new discovery and what was before—in the case of the vicarious hypothesis, it wasn't even perceptible. But take the case of the difference in using a bunch of polygons of increasing an number of sides to make a circle, versus the circle itself (Figure 2). If you put enough sides on that polygon, the difference can be as close to zero as you want, spatially; however, the

power of the difference does *not* become infinitely small. Although it's spatially infinitely small, or almost nonexistent, the power that's represented in it doesn't exist in a spatial world; it's in a world of power, it's a dynamic. And if you try to focus on it itself, it might appear to be nothing, although it's actually more powerful than the "somethings" that it's causing to behave the way that they do.

And so, in terms of science now, we have to have this approach that Socrates and Plato had, that Kepler had, that some of the last people who had it recently had—Planck, Einstein, Vernadsky, Furtwängler—that this approach, of what it means to make a discovery, of what it means to have a whole; if we don't bring that back to science, we're not going to get out of the empiricism that's preached by such as that evil, terrible man, Bertrand Russell.

Music's going to be an essential aspect of getting a real idea of what a discovery is, to bring science really forward now.

Science, Music, and the Imagination

LaRouche: Yes. We've reached a certain point in the three weeks of discussion on the subject. The subject is not closed; the subject has merely been demarked for further consideration. But this is extremely important, because we have to understand the function of what most people would consider the imagination. And in this area, people would say, "But that's *only* the imagination." But you have to look at the catastrophes that result from ignoring the imagination! And therefore, it's important that we go into the domain of the imagination, as we do here, because we're dealing with factors which we know, as factors; they're empirical factors. But we don't understand fully the mechanisms by which they operate. And that's precisely the issue. What we've gone into in these three weekly sessions, are some of the foundations of questions, or questioning, which are used by us to expose the frauds which we ordinarily believe.

And therefore, we do not come up with final answers; we come up with conclusions which denounce things that some people think are final answers. And it's the progress of continuing that process, which is essential. And only when you enter the doubt about your sense-certainties, do you actually begin to acquire genuine knowledge. And that's the function I believe we've tried to perform in these three-week sessions.

There's a lot to be said. There's so much of it, which

I already have said. But just as you have expressed again, Furtwängler has been expressing this question about the factor of uncertainty in conclusions. The question is, you have to get to *define* the uncertainties. And those then become the missions to perform.

But the important fact here is that what most people believe and rely upon, especially in government and what is often called science, that these things are frauds, because they are assumptions which are made, in defiance of evidence to the contrary. You find there are lacunae in what you know. Somebody then introduces an explanation which is relatively arbitrary and therefore denies the unknown which needed to be explored.

What science can do for us, is to point us in the direction of questions to be answered, and point out to us things that are the wrong answers, to a certain degree. And between the two of these kinds of conditions, we are able to steer ourselves into investigations.

For example, my own case as a forecaster: Most of my forecasts have determined the actual course of history, since the first one I made a long time ago, I should say now, back in the 1950s, that period. And the 1950s forecast I first made stands up today, in terms of method. It's the ability to foresee, as you expressed in your report on this, to foresee the future, as a necessary future, even though it is not demonstrated as deducible from the recent past. This is what we define, really, as creativity: the ability to see the option of the future as distinct from the recent past, or what seem to be the shadows of the recent past.

That's it. If we don't have that, if we don't have that self-critical drive, to get into the future and look back at the present, in this way, as the great forecasters have, you can not forecast competently. That is the reason why every modern forecaster who's publicly accepted by universities and so forth generally, why they're *all incompetent*: because they rely on only deduction, reverse deduction. They do not see the future. They would be embarrassed to mention the future. "That's only speculative!"

Well, it's not speculative. "I proved it's true, again and again, and you guys are still saying it's only speculative? Is it not the case that you're being stupid? Or stubbornly stupid, for trying to seek approval from the past? And you call yourself a person who's going to forecast the future?"

And this is the essential issue, and what I've got here in this piece on *The Universe Beyond*, will indicate some of the things that these questions portend.

Time To ‘Wise Up’

Ogden: And this is the urgently necessary political question for people to face.

LaRouche: People have got to realize that many of them have been stupid. They don’t like to hear that, but it’s true. Stupid in what sense? They don’t accept the creation of the future, that the future is a creation of something which has no active precedent as such, no literal precedent. It’s the attempt to *see* what’s wrong in the present, what’s a failure in the present, what’s a destructive force in the present, and to *change it*, and to see what you can do to *change it!*

Right now, the United States is threatened with destruction, self-destruction under British influence. We have the worst kind of President you can imagine, as a President. We have creepy characters who are running our government, in other capacities, who are actually destructive forces. They doom humanity by their very presence, let alone their bad breath! Because they have no opening to reality. Reality is always a change from the present to the future, and they can never get to the future.

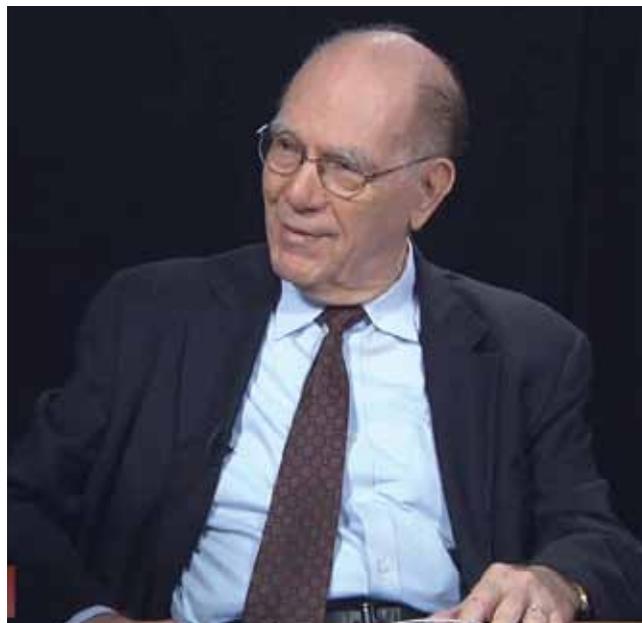
I’ve gone through this *again and again* in forecasting. Every time I’ve raised a major forecast, it worked. The other guys were wrong. The most famous one, of course, was 1971, where I had made this forecast, you know, in 1966, that this is where we were headed, this is the calamity your present policies are going to carry us into, and it was delivered in the Summer of 1971 [with the end of the Bretton Woods System]. And not a single economist in the nation who had piped up earlier, or piped up then, not a single one, had even *after the fact* admitted the fact of what had happened.

And it went on like that, again and again and again, up to the present time.

Ogden: Right. The point is, that the future has to be defined in its own terms. You can’t define the future according to the terms of the present.

LaRouche: Well, let’s take a case of discovery; like we’ve had various developments in chemistry, the nuclear and super-nuclear factors; these keep piling on to us. The more we discover, the more that they reveal to us, factors which are determined factors, which were not taken into account. Many of these things, like the discoveries in medicine which have saved lives, were things that did not exist until the actual *discovery*, as an original discovery, was made.

So it is this factor of discovery, in that sense, which



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Lyndon LaRouche: “Only when you enter the doubt about your sense-certainties, do you actually begin to acquire genuine knowledge. And that’s the function I believe we’ve tried to perform in these three weekly sessions.”

defines human intelligence. And people who go by deduction, always going by deduction, “You have to prove this by deduction!” is the hallmark of stupidity. And also calamity.

And that’s the point. You have to develop what is called sometimes “the poetic principle,” the creative principle. You find, in the great discovery by Furtwängler, this discovery was earthshaking, literally. Here it was, a musical discovery, it has an effect, of the fore-tone and after-tone, but *exactly* that, the idea of the fore-tone and the after-tone, *exactly*, defines the very principle of musical composition. And the very scientific principle of that subject.

And here, this guy emerges with a concept which corresponds to the creative powers of the *universe*, in this music. And you realize that the music is not just music per se. The music is a message! It’s a message to man’s destiny, a message to man’s opportunity for the future. And here’s a man, who’s considered “merely” a conductor, merely an imaginative conductor, and he actually produces the *greatest scientific discovery* in the current history of mankind.

And that’s the lesson to be taken from this table. And we should enjoy it, and participate in it, and ambulate this kind of discovery.

Ogden: Well said!