array of telescopes gets kind of interesting: They record the observations simultaneously onto magnetic tape; the tapes are then brought to a central location. Now, the tapes have to be synchronized *within one-millionth of a second.* That means, that you have to take ten magnetic tapes, and align them within one-millionth of a second. Now, if you do this—if you have this ability to line up these tapes within one-millionth of a second—you will have the VLBA with a maximum highest resolution of less than 1 milliarc-second—that's about one-thousandth of a second of an arc. If you don't understand what that means, it would be like reading a newspaper in Los Angeles standing in New York City. That's the resolution of this array of telescopes.

So, the exploration of space is now necessary. And we must increase the density of paradoxes and discoveries, if the human race is to survive. It is a project which could show all cultures, that we really are all human. Imagine: A Moon observatory on the dark side of the Moon. That would mean almost no interference from the Sun or the Earth, and our observations of these phenomena would be increased by the order of many magnitudes—therefore, increasing our power to make creative discoveries.

Animals are caged by their senses, and we are not. Let's just have some fun. Thank you.

4. Riana St. Classis

Metaphor and Platonic Creativity

I'm going to have to interject here—sort of like a LaRouchie at a Democratic district meeting.

Because, the problem is this: Without comprehending metaphor, you're not going to understand this panel. And, even though everything has seemed to go along very well, so far, we're going to have to take a break. The problem is, the problem of an idea: Because, I can't describe an idea to you, and have you hear it. And I couldn't paint you a picture and have you see it. And, I couldn't sculpt it, and have you be able to touch it. So, how do I communicate an action inside my mind, a motion, a generation—something that happens inside of me—and how do I know that I've replicated that. inside of you. "Aye, there's the rub," like Hamlet says.

So, let's begin here. I'd like to begin with a joke that Lyn is fond of using as an example. If I make the statement,

FEED THE CAT.

Those of you who aren't familiar with this joke, you immediately think that you know what that means, right? You might think that perhaps I should add some other information to that, to complete it. "Feed the cat"—when? "on Saturday"? What do I feed the cat? Do I feed him tuna? Which cat do I feed? Do I feed the tabby?

So, what happens now? Can I have the next one,

TO WHOM?

So, suddenly, your whole idea about the cat, is changed. The meaning of "the cat" has been changed. It's no longer a question of *bringing* the cat food; it's a question of "making" the cat food. If you weren't familiar with this, you might also have something happen—you feel, you know, maybe a little . . . shocked. Maybe there's an emotional component to this. The first statement was fairly mundane. But, now, all of a sudden, maybe you don't really feel so good about this any more!

This joke isn't exactly a metaphor. But, it certainly has irony; and the irony rests on this question of the verb "to feed," and how that verb changes in meaning when I juxtapose it to a different query. Instead of "when" or "what," I suddenly ask, "to whom?" And that changes the entire meaning of the word.

So in first approximation, our words are just like a primitive map of what we see; and, of maybe simple actions, like running or walking. The words don't actually give me a way of breaking out of the Sensorium. The words might give me a way of describing the bars of the cage. So, the question becomes, "How do I break out of the bars? How do I transcend language, so that I can transcend to understanding something about the Sensorium, other than what I see?"

This is actually the same question that the Greeks were looking at, when they were looking in constructive geometry, but it's posed in a different way. Because constructive geometry, mathematics, is actually a language—just a slightly different one, like music.

Let's look at a quote that Lyn has, from *The Science of Christian Economy;* he gets at this idea.

"Consider a Shakespeare tragedy, *Hamlet* for example. Or Schiller's *Don Carlos.* . . . Is the power of the drama in any of the utterances—even in Posa's 'king of a million kings'? The passion is located in the juxtaposition of essentially simple, more or less stylized words and movements, to force upon the audience a conception, of something which might be said to 'lie between the cracks' of anything said or done onstage. Hence, the form of a dramatic composition is as essential as the form of a non-Euclidean constructive geometry is to the creative thinking in mathematical physics."

At this point, I'd like to elicit a friend of mine, Keats, to get this idea across.

On First Looking Into Chapman's Homer

Much have I travelled in the realms of gold,
	And many goodly states and kingdoms seen;
	Round many western islands have I been
Which bards in fealty to Apollo hold.
Oft of one wide expanse had I been told
	That deep-browed Homer ruled, as his demesne;
	Yet did I never breathe its pure serene
Till I heard Chapman speak out, loud and bold:
Then felt I like some watcher of the skies
	When a new planet swims into its ken;
Or like stout Cortez when with eagle eyes
	He stared at the Pacific—and all his men
Looked at each other with a wild surmise—
	Silent, upon a peak in Darien.

So, where's the poem's meaning? See, the nerds always want you to explain; "I want you to explain t'me, what that poem me-e-a-ans." And, in fact, what you find out, is that most English teachers in our schools today are nerds, and they demand that you do, just what they said, to that poem. This is an example that I found online, of an English teacher who goes through an intensive analysis of this poem, to give a demonstration to her class.

First of all, she says, "You must put the poem into prose form, and make some statement out of it." This is her statement:

"The speaker says, that he had travelled through a lot of golden terrain, had read a lot of poems, and people had told him about the Homeric domain. But, he had never breathed its air, till he heard Chapman's speak out. Then, he felt like an astronomer, discovering a new planet. Or, like an explorer, who discovered the Pacific, whose men, astonished by his gaze, guessed at his discovery." She then goes on to say: Well this kind of meaning paraphrase is necessary, but in a poem, there's often very little by way of plot or character or normal information, in the ordinary sense, and it can usually be quickly sketched. So, if we want to learn things about the poem that are more interesting than simply "What It Says," we have to take it apart, piece by piece by piece.

And, when I'm reading her analysis of this poem—which goes on; they look at the meter, and they look at the climax, and they look at all of these various things about the poem—I start feeling like I did when I was in freshman biology lab, and you have this question about life. You look at an animal, like a cat; and the cat has life. And you think, "Where *is* the life? How do I get to it? Where is the location of the life, in that animal?" So . . . I take it apart! And, in the end, I'm left with a mess—with a dead, dismembered cat. I'm left with cat-burger. And the thing that I was looking for, the life—it's gone. It doesn't seem to be anywhere, at all.

So, the problem of the two means is a problem of going from my sense-perception to understanding, or to the real universe, actually. And, the way in which we do that, is, like going from "understanding" to "reason"; that's what Plato tell us, right? But, in a sense, it's sort of like what Hippocrates of Chios said. I can say that the problem of finding the double of the cube is a problem of finding two means between two extremes, but that's like turning one major puzzle into another . . . major puzzle!

What I'd like to do, is to go back to the poem. And I'd like to point out two striking juxtapositions: First of all, I'd like to point out how Homer, Chapman, Cortez (who, some people will tell you, is actually Balboa, who discovered the Pacific, but anyway—); Homer, Chapman, and Cortez, how they and Cortez all appear together, in this moment of the poem. And, I'd like you to look at Chapman, who was a contemporary of Shakespeare, and how he changes the meaning of Homer. He changes Homer across a vast distance of time and place. And, in a sense, he acts as a means, between Homer and Keats.

Now, in Jonathan Tennenbaum's presentation in Frankfurt [see *EIR*, Sept. 19, 2003], he speaks about a second Sensorium. He calls it "the Sensorium of mind": monads, who populate *our* mind. He calls it, "the celestial sphere of creative human personalities." And these are the people about whom—or some of them—about whom we're speaking tonight, like Archytas, and Plato. And, you can think about them, if you know them. And you can think of them, as hu-

FIGURE 4.1
Rembrandt's 'Aristotle Contemplating the Bust of Homer'

mans who've changed the meaning of our being human. And it's upon *them,* that we stand—it's on understanding. Through them, we get an understanding. But, in the Greek, this question of understanding, the Greek word for it is *dianoia,* which means "through reason": *dia-noēsis.* And so, the celestial sphere of personalities gives us a key to reason, but it doesn't give us reason.

Second, I'd like to look at how Keats emphasizes this question of seeing. It's on "First *Looking* Into Chapman's Homer." Apollo is the god of poetry, but also the god of light. And, you can see, Cortez stares with his "eagle eyes"; the men *look* at each other. But, the fulcrum of the poem, one of the things around which it rotates, in a sense, is Homer—and, Homer was blind, or at least, by tradition he was blind. And this question of seeing struck me, because in Greek, this word *noēsis,* comes from the verb *noëō,* which means "to perceive."

So, why would Plato choose that as the word for "reason"? As the word for this highest quality, which we're trying to get to? And, I thought, it's like Homer (**Figure 4.1**). Here is Rembrandt's *Aristotle Contemplating the Bust of Homer,* and a lot of people in the Schiller Institute have talked about it. But, if you look at Aristotle, he's got these dark, liquid eyes, kind of like an animal; and he's staring off into the distance; and he's groping on the head of this statue. And you notice that the light is actually coming from this dead, marble bust of Homer. You see that Homer looks like he's looking at Aristotle, with this look of pity. It's interesting—the blind, dead bust, and the living Aristotle, who is blind and can't see.

This same blindness seems to underlie the blocked mathematician, who wants to explain Archytas' solution to the cube problem. Every website that I've gone to, and even in the English translation of Eudemus' description of Archytas' solution to this problem, the translator, the mathematician—they can't help themselves. They have to *explain it;* and they have to explain it, with equations. They have to say, "Yes, yes, yes! It's very remarkable, that Archytas came up with this, 1,200 years ago. And if you use the equations for a cylinder, a torus, and a cone, and you make them intersect, and you set them equal to each other, and you do some simple algebraic manipulations—you find out, that Archytas was actually right!"

Thank you, Mr. Algebra! Archytas figured this out 1,200 years ago, and now you're saying, "Oh! But, by *my* equations, I see that he was . . . right." See, the mathematician might actually say, that "though these equations don't actually look like the cylinder, the torus, and the cone," the mathematician *sees* those things *in them.* So, what's the difference?

The difference is: The quality of discovery that Archytas made. How did he actually come up with the solution? What was going on in his mind? How did he actually generate this? See, he didn't use equations; and he was looking at an action. So, what enabled him to see? And, at what was he actually looking?

What I would say is, to these modern mathematicians, "Don't show me that the discovery worked! Show me how to make the discovery! Lead me through the discovery process, or at least give me the clues, on how to do that for myself." So, in Lyn's paper "On the Subject of Metaphor" [*Fidelio,* Fall 1992], he almost immediately jumps into a discussion of the Pythagorean Theorem, as metaphor. And this is what he says: The pupil is "guided to re-experience the mental act of original discovery by Pythagoras himself, thus to reconstruct a copy of that aspect of Pythagoras' creative mental processes within the mind of each of the pupils. This new existence, within the pupil's own mind, is itself an object of a special kind, a thought-object, identified by the metaphorical name 'Pythagorean Theorem.' "

If we look at this from the standpoint of the related problem, posed by Plato's *Meno,* that of doubling the square—can we see Jason's graphic (**Figure 4.2**)?—do we see that the problem is actually one of transformation? How do I transform a square of 1, into a square of 2? And see, it's a problem of relationship: Let's say, of the two sides of a right triangle (so, that right triangle down there, in the lower left), and the hypotenuse. What is the relationship between them, that enables me to have the power to generate the doubled square? And, this solution isn't apparent; it has to be seen. It has to be looked at, by the power of the lines to generate squares on themselves—it has to be looked at from the problem of the squares. You have to go outside of

FIGURE 4.2
Doubling the Square

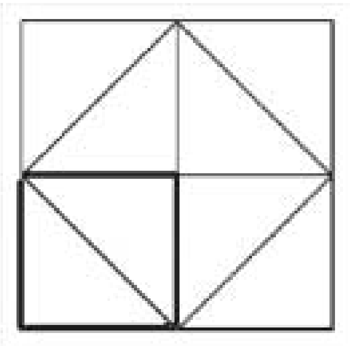

FIGURE 4.3
Cartesian Coordinate System f(x) = x

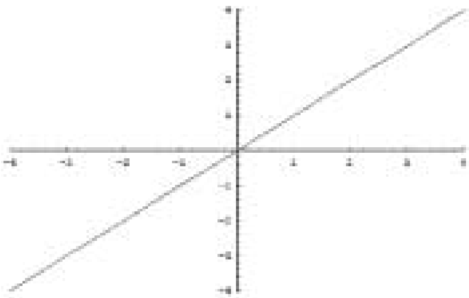

FIGURE 4.4
A Gauss Surface

the domain of the lines, to actually get a sense of this problem. And, what Jason went through, was that that hypotenuse can't be known in terms of the side of its square. So, what he went through was to show you how, the hypotenuse, in terms of the line of the square would have to both be even and odd. That's what Nicolaus of Cusa calls "a coincidence of opposites." And the question is, where does that happen? Where is that line, both even and odd?

So, if we look back at Archytas, and if we look at the description of his solution by Eudemus, we see something striking: He's looking at a process of becoming. He's looking about an action, and so, the way he describes it, is that, you take a semi-circle, and you rotate it up; you rotate that semi-circle about a point. You take a triangle, and you rotate that triangle, and the residue of these actions, that are taking place in conjunction with each other, is the solution. The residue of the action of the rotating triangle, is a cone; the action of the rotating semi-circle is a torus. What we're actually looking at, isn't the cone, the torus, and the cylinder—he's not looking at those things. *He's looking at a process.* And when he's looking at the means, he's looking at means in a process of generation. So, he's trying to get a sense of the process of generation, behind our Sensorium.

This solution, as Jonathan Tennenbaum, Bruce Director, and Fletcher James have all pointed out in pedagogicals on this topic, is like a polyphony. And, if you remember what Megan Beets and Matt Ogden demonstrated in the panel last night ["An Evening with the Classics, in Tribute to Graham Lowry"] with Rameau and Bach, you remember, that in Bach, there was this intersection of voices; there were independent voices moving together, elaborating a single idea—like a conversation. And music is a language, like constructive geometry. The real idea lies behind the composition; the real idea lies in the creative principle, in the actual creation; in the process behind the Sensorium, behind what is created.

So, the idea of Archytas, is behind that construction, and the two means are not objects.

When you begin to get a sense of this, you might have a sense of shock—like the joke, or the first six lines of Keats' sonnet, in relation to the last six lines. Like, after Keats has actually discovered Chapman. You have a sense of shock, at the underlying paradox, that you have to go outside of the domain in which you are operating to get your solution.

Now, for anyone who has worked on Gauss's Fundamental Theorem of Algebra paper, you might remember a shock, or a discomfort, when you hit Section 13: because, at first, Gauss states what he means to prove. And then, he goes through and shows what's absurd about the reasoning—or what's actually not so absurd as deceptive, in the reasoning of D'Alembert, Euler, and Lagrange, because they're all rooting around in the realm of algebra to find the solution. And he suddenly throws out this circular function, and he says, it has a particular property, and he proves it. And, you wonder, "Where did these sines come from? Where did these cosines come from? I mean, I was doing what's just a simple x^2, and now I'm dealing with $2r^2$cosinQC. What does that mean?" And, what Gauss is actually getting at, is a relationship, between the real universe, and sense-perception. And he's looking at the process behind the powers. He's making a metaphor.

Here's an example of our Cartesian coordinate system (**Figure 4.3**) and a simple function f(x) = x. With **Figure 4.4,** that's a picture of an approximation of a Gauss surface. See, the left is the cosine and the right is the sine, but that doesn't necessarily have to mean anything. What it is, is an approximation at getting at what Gauss shows is actually going on, in the equation. And that's actually not it, either; but, it's to help you get an approximation of the actual idea.

This is a quote from Gauss, which Bruce Director is fond of using, and I am, too: "These investigations lead deeply into many others; I would even say, into the metaphysics of the theory of space; and it is only with great difficulty, that I can tear myself away from the results that spring from it, as, for example, the true metaphysics of negative and complex numbers. The true sense of the $\sqrt{-1}$ stands before my mind fully alive; but it becomes very difficult to put into words; I am always only able to give a vague image that floats in the air."

So, the reality isn't out there. The reality isn't in the equation; the reality isn't in the surface; and the reality isn't in the words. So, this is like the metaphor that Kepler makes, when he's looking at the paradox of the motion of Mars from a higher standpoint. And see, Kepler is different than the blocked mathematician, because he's happy when he finds the paradox. Because it means that that's a gateway into making a real discovery. It means that the universe, through that crack, is going to let him perceive what's going on behind.

I'm going to read this Kepler quote—pay attention to his wording at the beginning, as well: "It is permissible, using the thread of analogy as a guide, to traverse the labyrinths of the mysteries of nature. I believe the following arguments can not be put aside. The relation of the six spheres to their common center, thereby the center of the whole world, is also the same relation, as that of unfolded Mind (*dianoia*)—understanding—to Mind (*noös*)—to reason. On the other hand, the relation of the single planets' revolutions from place to place around the Sun, to the unvarying of the rotation of the Sun in the central space of the whole system, is also the same as the relation of unfolded Mind to the Mind; which is, that of the manifold of dialectics, to the most simple cognition of the Mind. For as the Sun, rotating into itself, moves all the planets by means of the form emitting from itself, so too, as the philosophers teach, Mind stirs up dialectics, by which it understands itself and in itself all things, and by unfolding and unrolling its simplicity into those dialectics, it makes everything known. And the movements of the planets around the Sun at their center, and the unfolded dialectics are so interwoven and bound together, that, unless the Earth, our domicile, measured out the annual circle, midway between the other spheres changing from place to place, from station never would human cognition have worked its way to the true intervals of the planets, and to the other things dependent from them, and never would it have constituted astronomy."

So, without paradox—without the paradox of Mars, and those motions upon motions—we never would have been led into actually making discoveries, into investigating what is actually behind the Sensorium. So, if we must communicate to each other through metaphor, how does the universe communicate to us?

5. Sky Shields

On the Crab Nebula

The Crab Nebula was first observed in 1731. It's right up there, as a smudge, in the constellation Taurus (**Figure 5.1**). Now, you can't see it with your naked eye. So, already we're dealing with something interesting.

It occupies a swath of approximately 5′ [minutes] of arc in length, and 3′ of arc wide, on the celestial sphere—the sphere that Merv described. To get an idea of the size: A minute of arc—people know you divide a circle into 360°; you can take one of those degrees and divide it again, into 60 minutes—so, 1′ of arc, is one-sixtieth of 1°. So, you can see why this thing is not visible, except as a projection onto our extended Sensorium of astronomical instruments.

But by the middle of the 19th Century, it was already possible, thanks to developments in the technology of telescopes and this sort of thing, to start to see details of it. And you're able to see a detail, sort of irregular legs or filaments in it, which is how it got the name "the Crab." We can see the next (**upper right image, Figure 5.2**). This is a later one. This is a photo taken by the European Southern Observatory.