BEFORE we proceed further, I want to elaborate on the contrast made by Carl Gustav Jung* between Creatura and Pleroma. This will give us an alternative starting point for epistemology, one that will be a much healthier first step than the separation of mind from matter attributed to René Descartes. In place of the old Cartesian dualism, which proposed mind and matter as distinct substances, I want to talk about the nature of mental process, or thought, in the widest sense of that word, and the relationship between “thought” and the material world.

I am going to include within the category mental process a number of phenomena which most people do not think of as processes of thought. For example, I shall include the processes by which you and I achieve our anatomy—the injunctions, false starts and self-corrections, obediences to circumstance, and so on, by which the differentiation and development of the embryo is achieved. “Embryology” is for me a mental process. And I shall also include the still more mysterious processes by which it comes about that the formal relations of our anatomy are recognizable in the anthropoid ape, the horse, and the whale—what zoologists call homology—i.e. along with embryology I shall include evolution within the term “mental process.”

*In Septem Sermones ad Mortuos. In later works, e.g. in Answer to Job, Jung uses these words in such a way as to include his archetypes within Pleroma. I believe that this latter usage is more in step with classical and medieval thought, but I also believe that Jung’s earlier way of talking provides a clearer base for epistemology.
Along with those two big ones—biological evolution and embryology—I include all those lesser exchanges of information and injunction that occur inside organisms and between organisms and that, in the aggregate, we call life.

In fact, wherever information—or comparison—is of the essence of our explanation, there, for me, is mental process. Information can be defined as a difference that makes a difference. A sensory end organ is a comparator, a device which responds to difference. Of course, the sensory end organ is material, but it is this responsiveness to difference that we shall use to distinguish its functioning as "mental." Similarly, the ink on this page is material, but the ink is not my thought. Even at the most elementary level, the ink is not signal or message. The difference between paper and ink is the signal.

It is, of course, true that our explanations, our textbooks dealing with nonliving matter, are full of information. But this information is all ours; it is part of our life processes. The world of nonliving matter, the Pleroma, which is described by the laws of physics and chemistry, itself contains no description. A stone does not respond to information and does not use injunctions or information or trial and error in its internal organization. To respond in a behavioral sense, the stone would have to use energy contained within itself, as organisms do. It would cease to be a stone. The stone is affected by "forces" and "impacts," but not by differences.

I can describe the stone, but it can describe nothing. I can use the stone as a signal—perhaps as a landmark. But it is not the landmark.

I can give the stone a name; I can distinguish it from other stones. But it is not its name, and it cannot distinguish.

It uses and contains no information.

"It" is not even an it, except insofar as I distinguish it from the remainder of inanimate matter.

What happens to the stone and what it does when nobody is around is not part of the mental process of any living thing. For that it must somehow make and receive news.

You must understand that while Pleroma is without thought or information, it still contains—is the matrix of—many other sorts of regularities. Inertia, cause and effect, connection and disconnection, and so on, these regularities are (for lack of a better word) immanent in Pleroma. Although they can be translated (again for lack of a better word) into the language of Creatura (where alone language can exist), the
material world still remains inaccessible, the Kantian Ding an sich which you cannot get close to. We can speculate—and we have speculated very carefully and very creatively about it—but in the end, at the last analysis, everything we say about Pleroma is a matter of speculation, and such mystics as William Blake, for example, frankly deny its existence.

In summary then, we will use Jung's term Pleroma as a name for that unliving world described by physics which in itself contains and makes no distinctions, though we must, of course, make distinctions in our description of it.

In contrast, we will use Creatura for that world of explanation in which the very phenomena to be described are among themselves governed and determined by difference, distinction, and information.

[Although there is an apparent dualism in this dichotomy between Creatura and Pleroma, it is important to be clear that these two are not in any way separate or separable, except as levels of description. On the one hand, all of Creatura exists within and through Pleroma; the use of the term Creatura affirms the presence of certain organizational and communicational characteristics which are themselves not material. On the other hand, knowledge of Pleroma exists only in Creatura. We can meet the two only in combination, never separately. The laws of physics and chemistry are by no means irrelevant to the Creatura—they continue to apply—but they are not sufficient for explanation. Thus, Creatura and Pleroma are not, like Descartes' "mind" and "matter," separate substances, for mental processes require arrangements of matter in which to occur, areas where Pleroma is characterized by organization which permits it to be affected by information as well as by physical events.

[We can move on from the notion of mental process to ask, what, then, is "a mind"? And if this is a useful notion, can one usefully make a plural and speak of "minds" which might engage in interactions which are in turn mental? The characterization of the notion of "a mind" was one of the central thrusts of Mind and Nature, where a series of criteria were laid out for the identification of "minds." The definition anchors the notion of a mind firmly to the arrangement of material parts:

1. A mind is an aggregate of interacting parts or components.
2. The interaction between parts of mind is triggered by difference.
3. Mental process requires collateral energy.
4. Mental process requires circular (or more complex) chains of determination.
5. In mental process, the effects of difference are to be regarded as transforms (i.e. coded versions) of events which preceded them.

6. The description and classification of these processes of transformation disclose a hierarchy of logical types immanent in the phenomena.*

[If you consider these criteria, you will recognize that they fit a number of complex entities that we are used to talking about and investigating scientifically, such as animals and persons and, in fact, all organisms. They also apply to parts of organisms that have a degree of autonomy in their self-regulation and functioning: individual cells, for instance, and organs. Then, you can go on to notice that there is no requirement of a clear boundary, like a surrounding envelope of skin or membrane, and you can recognize that this definition includes only some of the characteristics of what we call “life.” As a result, it applies to a much wider range of those complex phenomena called “systems,” including systems consisting of multiple organisms or systems in which some of the parts are living and some are not, or even to systems in which there are no living parts. What is described here is a something that can receive information and can, through the self-regulation or self-correction made possible by circular trains of causation, maintain the truth of certain propositions about itself. These two provide the rudiments of identity—unlike the stone, the mind we are describing is an “it.” There is, however, no reason to assume that it will be either conscious or capable of self-replication, like some of the minds we count among our friends and relatives. A given mind is likely to be a component or subsystem in some larger and more complex mind, as an individual cell may be a component in an organism, or a person may be a component in a community. The world of mental process opens into a self-organizing world of Chinese boxes in which information generates further information.

[This book is above all concerned with certain characteristics of the interface between Pleroma and Creatura and also with interfaces between different kinds of mental subsystems, including relations between persons and between human communities and ecosystems. We will be especially concerned with the way in which our understanding of such interfaces underlies epistemology and religion, bearing in mind that because what is is identical for all human purposes with what can be known, there can be no clear line between epistemology and ontology.]
act of distinguishing, we are founding the science of Epistemology, rules of thought. And our Epistemology is a good epistemology insofar as the regularities of Pleroma can be correctly, appropriately translated in our thought, and insofar as our understanding of Creatura, namely of all of embryology, biological evolution, ecology, thought, love and hate, and human organization—all of which require rather different kinds of description than those we use in describing the inanimate material world—can grow and sit on top of (can be comfortably deductive from) that primary step in Epistemology.

I think that Descartes' first epistemological steps—the separation of "mind" from "matter" and the cogito—established bad premises, perhaps ultimately lethal premises, for Epistemology, and I believe that Jung's statement of connection between Pleroma and Creatura is a much healthier first step. Jung's epistemology starts from comparison of difference—not from matter.

So I will define Epistemology as the science that studies the process of knowing—the interaction of the capacity to respond to differences, on the one hand, with the material world in which those differences somehow originate, on the other. We are concerned then with an interface between Pleroma and Creatura.

There is a more conventional definition of epistemology, which simply says that epistemology is the philosophic study of how knowledge is possible. I prefer my definition—how knowing is done—because it frames Creatura within the larger total, the presumably lifeless realm of Pleroma; and because my definition bluntly identifies Epistemology as the study of phenomena at an interface and as a branch of natural history.

Let me begin this study by mentioning a basic characteristic of the interface between Pleroma and Creatura, which will perhaps help to define the direction of my thinking. I mean the universal circumstance that the interface between Pleroma and Creatura is an example of the contrast between "map" and "territory"—is, I suppose, the primary and most fundamental example. This is the old contrast to which Alfred Korzybski* long ago called attention, and it remains basic for all healthy epistemologies and basic to Epistemology.

Every human individual—every organism—has his or her personal habits of how he or she builds knowledge, and every cultural, religious, or scientific system promotes particular epistemological habits. These

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individual or local systems are indicated here with a small $e$. Warren McCulloch used to say that the man who claimed to have direct knowledge—i.e. no epistemology—had a bad one.

It is the task of anthropologists to achieve comparisons between the many and diverse systems and perhaps to evaluate the price that muddled systems pay for their errors. Most local epistemologies—personal and cultural—continually err, alas, in confusing map with territory and in assuming that the rules for drawing maps are immanent in the nature of that which is being represented in the map.

All of the following rules of accurate thought and communication apply to the properties of maps, that is, to mental process, for in the Pleroma there are no maps, no names, no classes, and no members of classes.

The map is not the territory.

The name is not the thing named.

The name of the name is not the name. (You remember the White Knight and Alice? Alice is rather tired of listening to songs and, offered yet another, she asks its name. "The name of the song is called 'Haddocks' Eyes,'" says the White Knight. "That's the name of the song, is it?" says Alice. "No, you don't understand," says the White Knight, "that's not the name of the song, that's what the name is called."

The item in the class is not the class (even when the class has only one item).

The class is not a member of itself.

Some classes have no members. (If, for example, I say, "I never read the small print," there is no class of events consisting of my reading the small print.)

In the Creatura, all is names, maps, and names of relations—but still the name of the name is not the name, and the name of the relation is not the relation—even when the relation between $A$ and $B$ is of the kind we denote by saying that $A$ is the name of $B$.

These constraints are Eternal. They are necessarily true, and to recognize them gives something resembling freedom—or shall we say that it is a necessary condition of skill. It will be interesting to compare them with other basic components of Epistemology such as Saint Augustine's

*Lewis Carroll, Alice Through the Looking Glass (New York: New American Library, 1960), 212. CB here uses the example from Alice to make a transition from Korzybski to the theory of logical types.
Eternal Verities or Jung’s archetypes, and see where these fall in relation to the interface.

Now, Saint Augustine was not only a theologian, he was also a mathematician. He lived in Hippo in North Africa and was probably more Semite than Indo-European, which means in the present context that he may very well have been quite at home in algebraic thought. It was, I gather, the Arabs who introduced the concept “any” into mathematics, thus creating algebra, for which we still use an Arabic word.

These verities were rather simple propositions, and here I quote Warren McCulloch,* to whom I owe much: “Listen to the thunder of that saint, in almost A.D. 500: ‘Seven and three are ten; seven and three have always been ten; seven and three at no time and in no way have ever been anything but ten; seven and three will always be ten. I say that these indestructible truths of arithmetic are common to all who reason.’ ”

Saint Augustine’s Eternal Verities were crudely or bluntly stated, but I think the saint would go along with the more modern versions: e.g. that the equation

\[ x + y = z \]

is soluble, and uniquely soluble—there is only one solution—for all values of \( x \) and \( y \), provided that we agree on the steps and tricks which we must use. If “quantities” are appropriately defined and if “addition” is appropriately defined, then \( x + y = z \) is uniquely soluble. And \( z \) will be of one substance with \( x \) and \( y \).

But, oh my, what a long step it is from the blunt statement “Seven plus three equals ten” to our cautious generalization hedged with definitions and conditions. We have in a certain sense pulled the whole of arithmetic over the line that was to divide Creatura from Pleroma. That is, the statement no longer has the flavor of naked truth and instead is clearly an artifact of human thought, indeed of the thought of particular humans at particular times and places.

Is it then so, that Saint Augustine’s Eternal Verities are only spin-offs from peculiar ideas or customs cherished at various times by various human cultural systems?

I am an anthropologist by trade and training, and ideas of cultural relativity are a part of anthropological orthodoxy . . . but how far can cultural relativity go? What can the cultural relativist say about the Eternal

Verities? Does not arithmetic have roots in the unchanging, solid rock of Pleroma? And how can we talk about such a question?

Is there then such a subject of inquiry as Epistemology, with a capital E? Or is it all a matter of local and even personal epistemologies, any one of which is as good, as right, as any other?

These are the kinds of questions that arise when we try to survey the interface between Pleroma and Creatura, and it is clear that arithmetic somehow lies very close to that line.

But do not dismiss such questions as “abstract” or “intellectual,” and therefore meaningless. For these abstract questions will lead us to some very immediately human matters. What sort of question are we asking when we say, “What is heresy?” or “What is a sacrament?” These are deeply human questions—matters of life and death, sanity and insanity, to millions of people—and the answers (if any) are concealed in the paradoxes generated by the line between Creatura and Pleroma . . . the line which the Gnostics, Jung, and I would substitute for the Cartesian separation of mind from matter . . . the line that is really a bridge or pathway for messages.

Is it possible to be Epistemologically wrong? Wrong at the very root of thought? Christians, Moslems, Marxists (and many biologists) say yes—they call such error “heresy” and equate it with spiritual death. The other religions—Hinduism, Buddhism, the more frankly pluralistic religions—seem to be largely unaware of the problem. The possibility of Epistemological error does not enter their epistemology. And today in America it is almost heresy to believe that the roots of thought have any importance, and it is undemocratic to excommunicate a man for Epistemological errors. If religions are concerned with Epistemology, how shall we interpret the fact that some have the concept of “heresy” and some do not?

I believe that the story goes back to the most sophisticated religion that the world has known—that of the Pythagoreans. Like Saint Augustine, they knew that Truth has some of its roots (not all) in numerology, in numbers. The history is obscure, probably because it is difficult for us to see the world through Pythagorean eyes, but it seems to be something like this: Egyptian mathematics was pure arithmetic and always particular, never making the jump from “seven and three are ten” to “$x$ plus $y$ equals $z$. “ Their mathematics contained no deductions and no proofs as we would understand the term. The Greeks had proofs from about the fifth century B.C., but it seems that mere deduction is a toy until the discovery of proof of an impossibility by reducio ad absurdum. The Pythagoreans
had a whole string of theorems (which are not taught in schools today) about the relations between odd and even numbers. The climax of this study was the proof that the isosceles right triangle, with sides of unit length, is insoluble—that $\sqrt{2}$ cannot be either an odd or an even number, and therefore cannot be a number or be expressed as a ratio between two numbers.*

This discovery hit the Pythagoreans squarely between the eyes and became a central secret (but why secret?), an esoteric tenet of their faith. Their religion had been founded on the discontinuity of the series of musical harmonics—the demonstration that that discontinuity was indeed real and was firmly founded upon rigorous deduction.

And now they faced an impossibility proof. Deduction had said no.

As I read the story, from then on it was inevitable to “believe,” to “see” and “know” that a contradiction among the higher generalizations will always lead to mental chaos. From this point on, the idea of heresy, the notion that to be wrong in Epistemology could be lethal, was inevitable.

All this sweat and tears—and even blood—was to be shed on quite abstract propositions whose Truth seemed to lie, in some sense, outside the human mind.

As I see it, the propositions that Augustine and Pythagoras were interested in and which Augustine called Eternal Verities are, in a sense, latent in Pleroma—only waiting to be labeled by some scientist. If, for example, a man is pouring lentils or grains of sand from one container into another, he is not aware of any numbering of the units, but still within the crowd of lentils or grains it is true—or would be true if somebody got in there and did some counting (perhaps the ghost of Bishop Berkeley might be willing to do it for us, just to make sure that the truth is still the same when we are not there)—that seven plus three equals ten among the lentils.

In this sense there is a whole slew of regularities out there in Pleroma, unnamed, ready to be picked up. But the distinctions and differences that would be used in an analysis have not been drawn, in the absence of organisms to whom the differences can make a difference. (Bishop Berkeley always forgot the grass and the squirrels in the woods, for whom the falling tree made a meaningful sound!)

I want to make very clear the contrast between Pleromatic regularities and those regularities that exist inside mental and organized systems—the necessary limitations and patterns of mental process, such as those of coding and logical typing.

McCulloch's famous double question: "What is a number that a man may know it: and what is a man that he may know a number?"* takes on a very different coloring, presents new difficulties, when we substitute some archetype for the utterly impersonal concept "number." The Jungian archetypes have a certain claim to transcend the purely local, but they belong squarely in the realm of Creatura.

What is a father that a man, a woman, or a child may know him; and what is a man, or woman, or child, that he or she may know a father?

Let me offer you an example, what in field anthropology we would call a native text—a crucial cultural utterance:

Our Father which art in heaven,
Hallowed be thy name.

The epistemology latent in that text is enough to keep us busy for a long while.

The words themselves are sanctified—hallowed, to use their own idiom—by the gospel narrative (Matt. 6:9), according to which Jesus recommended this prayer to his disciples for myriad repetition. In every Christian ceremony, these words are in a strange way the rock upon which the whole structure stands—the words are the familiar theme to which the ritual continually returns, not as to a logical premise but rather as music returns to a theme or phrase from which it is built.

For while the quasi-Pleromatic verities of Augustine and Pythagoras have roots in logic or mathematics, we are now looking at something different.

"Our Father . . ."

This is the language of metaphor, and a very strange language it is.

First we need some contrasting data to show that we are in the realm of epistemology with a small e. (If you would seek for an absolute Epistemology among the metaphors, you must go one or perhaps two stories higher—straight on and up the stairs . . .)

In Bali, when a shaman, or balian, goes into a state of altered consciousness, he or she speaks with the voice of a god, using the pronouns

*Embodiments of Mind, 1–18.
appropriate to the god, and so on. And when this voice addresses ordinary adult mortals, it will call them "Papa" or "Mama." For the Balinese think of the relationship between gods and people as between children and parents, and in this relationship it is the gods who are the children and the people who are the parents.

The Balinese do not expect their gods to be responsible. They do not feel cheated when the gods are capricious. Indeed, they enjoy minor caprice and charm as these are exhibited by gods temporarily incarnate in shamans. How unlike our dear Job!

This particular metaphor, then, between fatherhood and godhead, is by no means eternal or universal. In other words, the "logic" of metaphor is something very different from the logic of the verities of Augustine and Pythagoras. Not, you understand, "wrong," but totally different. [It may be, however, that while particular metaphors are local, the process of making metaphor has some wider significance—may indeed be a basic characteristic of Creatura.]

Let me point up the contrast between the truths of metaphor and the truths that the mathematicians pursue by a rather violent and inappropriate trick. Let me spell out metaphor into syllogistic form: Classical logic named several varieties of syllogism, of which the best known is the "syllogism in Barbara." It goes like this:

Men die;
Socrates is a man;
Socrates will die.

The basic structure of this little monster—its skeleton—is built upon classification. The predicate ("will die") is attached to Socrates by identifying him as a member of a class whose members share that predicate.

The syllogisms of metaphor are quite different, and go like this:

Grass dies;
Men die;
Men are grass.

[In order to talk about this kind of syllogism and compare it to the "syllogism in Barbara," we can nickname it the "syllogism in grass."] I understand that teachers of classical logic strongly disapprove of this way of arguing and call it "affirming the consequent," and, of course, this pedantic condemnation is justified if what they condemn is confusion between one type of syllogism and the other. But to try to fight all
syllogisms in grass would be silly because these syllogisms are the very stuff of which natural history is made. When we look for regularities in the biological world, we meet them all the time.

Von Domarus long ago pointed out that schizophrenics commonly talk and act in terms of syllogisms in grass,* and I think he, too, disapproved of this way of organizing knowledge and life. If I remember rightly, he does not notice that poetry, art, dream, humor, and religion share with schizophrenia a preference for syllogisms in grass.

But whether you approve or disapprove of poetry, dream, and psychosis, the generalization remains that biological data make sense—are connected together—by syllogisms in grass. The whole of animal behavior, the whole of repetitive anatomy, and the whole of biological evolution—each of these vast realms is within itself linked together by syllogisms in grass, whether the logicians like it or not.

It's really very simple—in order to make syllogisms in Barbara, you must have identified classes, so that subjects and predicates can be differentiated. But, apart from language, there are no named classes and no subject-predicate relations. Therefore, syllogisms in grass must be the dominant mode of communicating interconnection of ideas in all preverbal realms.

I think the first person who actually saw this clearly was Goethe, who noted that if you examine a cabbage and an oak tree, two rather different sorts of organism, but still both flowering plants, you would find that the way to talk about how they are put together is different from the way most people naturally talk. You see, we talk as if the Creatura were really Pleromatic: we talk about "things," notably leaves or stems, and we try to determine what is what. Now Goethe discovered that a "leaf" is defined as that which grows on a stem and has a bud in its angle; what then comes out of that angle (out of that bud) is again a stem. The correct units of description are not leaf and stem but the relations between them.

*E. von Domarus, "The Specific Laws of Logic in Schizophrenia," Language and Thought in Schizophrenia, ed. J. S. Kasanin (Berkeley: U of California P, 1944). GB developed these ideas in response to criticism by Nick Humphrey ("New Ideas, Old Ideas," The London Review of Books, 6 December 1979) of the argument of Mind and Nature, which may be said to have the following structure:

Evolution is stochastic (able to achieve novelty by a combination of random and selective processes);
Mental process (such as thought) is stochastic;
Evolution is a mental process.
These correspondences allow you to look at another flowering plant—a potato, for instance—and recognize that the part that you eat in fact corresponds to a stem.

In the same way, most of us were taught in school that a noun is the name of a person, place, or thing, but what we should have been taught is that a noun can stand in various kinds of relationship to other parts of the sentence, so that the whole of grammar could be defined as relationship and not in terms of things. This naming activity, which probably other organisms don’t indulge in, is in fact a sort of Pleromatizing of the living world. And observe that grammatical relationships are of the preverbal kind. “The ship struck a reef” and “I spanked my daughter” are tied together by grammatical analogy.

I went to see the nice little pack of wolves in Chicago at the Brookfield Zoo, ten of them lying asleep all day and the eleventh one, the dominant male, busily running around keeping track of things. Now what wolves do is to go out hunting and then come home and regurgitate their food to share with the puppies who weren’t along on the hunt. And the puppies can signal the adults to regurgitate. But eventually the adult wolves wean the babies from the regurgitated food by pressing down with their jaws on the backs of the babies’ necks. In the domestic dog, females eventually wean their young from milk in the same way. In Chicago they told me that the previous year one of the junior males had succeeded in mounting a female. Up rushed the lead male—the alpha animal—but instead of mayhem all that happened was that the leader pressed the head of the junior male down to the ground in the same way, once, twice, four times, and then walked off. The communication that occurred was metaphoric: “You puppy, you!” The communication to the junior wolf of how to behave is based on a syllogism in grass.

But let us go back to the Lord’s Prayer:

Our Father which art in heaven,
Hallowed be thy name.

Of course, my assertion that all preverbal and nonverbal communication depends upon metaphor and/or syllogisms in grass does not mean that all verbal communication is—or should be—logical or nonmetaphoric. Metaphor runs right through Creatura, so, of course, all verbal communication necessarily contains metaphor. And metaphor when it
is dressed in words has added to it those characteristics that verbalism can achieve: the possibility of simple negation (there is no not at the preverbal level), the possibility of classification, of subject-predicate differentiation, and the possibility of explicit context marking.

Finally there is the possibility, with words, of jumping right out of the metaphoric and poetic mode into simile. What Vaihinger called the as if mode of communication becomes something else when the as if is added. In a word, it becomes prose, and then all the limitations of the syllogisms that logicians prefer, Barbara and the rest, must be precisely obeyed.

The Lord's Prayer might then become:

It is as if you or something were alive and personal, and if that were so, it would perhaps be appropriate to talk to you in words. So, although, of course, you are not a relative of mine, since you only as if exist and are, as it were, in another plane (in heaven), etc. . . .

And you know, in human ethnography, the creativeness of human minds is capable of that extreme, and most surprisingly, that extreme can itself constitute a religion—among behaviorists for example. In a currently fashionable metaphor, the right hemisphere can applaud (and be reassured in) the prosy, cautious logic of the left.

The very act of translation—from grass to Barbara, from metaphor to simile, and from poetry to prose—can itself become sacramental, a sacred metaphor for a particular religious stance. Cromwell's troops could run around England, breaking the noses and even heads and genitals off the statues in the churches, in a religious fervor, simultaneously stressing their own total misunderstanding of what the metaphoric-sacred is all about.

I used to say—have said many times—that the Protestant interpretation of the words "This is my Body—This is my Blood" substitutes something like "This stands for my Body—This stands for my Blood." This way of interpretation banished from the Church that part of the mind that makes metaphor, poetry, and religion—the part of the mind that most belonged in Church—but you cannot keep it out. There is no doubt that Cromwell's troops were making their own (horrible) poetry by their acts of vandalism—in which indeed they smashed the metaphoric genitals as if they were "real" in a left brain sense—

What a mess. But nonetheless, we cannot simply discard the logic of metaphor and the syllogism in grass, for the syllogism in Barbara would
be of little use in the biological world until the invention of language and the separation of subjects from predicates. In other words, it looks as though until 100,000 years ago, perhaps at most 1,000,000 years ago, there were no Barbara syllogisms in the world, and there were only Bateson’s kind, and still the organisms got along all right. They managed to organize themselves in their embryology to have two eyes, one on each side of a nose. They managed to organize themselves in their evolution so there were shared predicates between the horse and the man, which zoologists today call homology. It becomes evident that metaphor is not just pretty poetry, it is not either good or bad logic, but is in fact the logic upon which the biological world has been built, the main characteristic and organizing glue of this world of mental process that I have been trying to sketch for you.