CATS

Why do cats eat a little bit at a time while dogs eat the whole thing? It's because cats are descended from mouse eaters, and they get a little bit at t time, while dogs are descended from deer eaters, and they eat the whole thing. The older programming still shows through even though it may no longer be appropriate.

When dogs defecate, they still scratch though it no longer has much to do with what they just did. And we were programmed in the jungle to eat fruits because they were sweet, but your sweet tooth might be fatal in Paris.

We were programmed in the jungles and on the beaches of Africa, and that's why, come summer, we head for the forests or the beach. And that's why we have national parks with their forests and their beaches. But if we ever become reprogrammed for cities and for urban sprawl then, when the oil runs out, we'll save New York for a national park with the lights and music of our genetic past.

CAUSATION

VIVARTA AND PARINAMA
Apparitional and Transformational Causation

Philosophical views in India are often catalogued according to their views on causation. Some of the philosophers are said to be Parinama Vadins (that is: they believe that causation is transformational); and some are said to be Vivarta Vadins (that is, they believe that causation is apparitional); and they tend to hold to only one of these forms of causation.

But by what causation could the Universe arise, *and from what*?

Transformational causation, or Parinama, is what we usually think of as causation. It is what happens when milk is transformed into buttermilk, or when the gravitational energy of a falling stone is transformed into kinetic energy in the fall. It represents an *actual* transformation; not simply a mistake. And, although the form of the energy may thus be changed, the amount of the energy remains constant.

Apparitional causation, or Vivarta, on the other hand, is what happens when you mistake your friend for a ghost. Nothing happens to your friend. But if your friend is tall and thin, then the ghost will be tall and thin. And if your friend is roly-poly, you'll see a roly-poly ghost. That is because the characteristics of your friend are what you see as the characteristics of the ghost. Something of your friend *must* show in the ghost.

Now a question arises. Can the Universe which we see have arisen by either of these two forms of causation, and if so, by which, and from what?

In order for the Universe to have arisen by Parinama, something must have existed earlier which could have been *transformed* into this Universe. And we need to know what that could be.

And since, as was pointed out by the Einsteins in 1905, and by the physicists in India a few thousand years earlier, the Universe is made out of energy, Shakti; and since in Parinama the *amount* of energy never changes; it naturally follows that for the Universe to have arisen by Parinama, all that energy must have existed beforehand, before it could be transformed into the Universe. So, since that energy would itself require a cause, this problem retreats indefinitely. The Universe could *not* have arisen by Parinama.

The problem for Vivarta is very different. In order for the Universe to have arisen by Vivarta there need only be an existence which could be *mistaken* for this Universe. And we need to know what that could be.

Vivarta involves perception, or sentiency. In order to mistake one thing for another, you have to *perceive* the one thing, and *something of that one must show in the other.* And the question, then, is this: since the Universe is made out of energy, what could have been mistaken for that energy, and in what way could it be expected to show in our physics.

If, following the trend of the modern cosmologists, we consider space and time to be part of the Universe; we may then suppose that what we have *mistaken* for the Universe might *not* be in space and time. That would allow us to say something about what that existence could *not* be. It couldn't be changing if it's not in time, nor finite and divided if it's not in space.

The question then is this: do we have any *observational* evidence that the changeless, the infinite, the undivided show in our physics? *Yes, we most certainly do.* The conservation of energy, and the fact that energy shows inertia, are the observational evidence that the changeless shows in our physics. The fact that the minuscule particles (the protons and electrons) have a dispersional electrical charge, and that their electrical energy would go to zero only if their sizes went to infinity, is the observational evidence that the infinite shows in our physics. And, finally, gravity and the attraction between opposite charges, and the fact that the gravitational energy of the Universe would go to zero only if the dividedness of the Universe went to zero, is the observational evidence that the undivided shows in our physics. None of these things, as pointed out by Richard Feynman, have any alternative explanation in the halls of academia.

Heretofore, we have had no way to understand the conservation of energy or its inertia. And, heretofore, we have had no way to understand gravity or electricity. Why, if the particles are minuscule, do they have to be electrical? And why, if they are separated, do they have to fall together? And, finally, why, if they are moving, do they coast?

If energy is that underlying existence showing as changeless through the changes in time, then we *do* have a way to understand the conservation of energy and its inertia. They are simply the changeless showing through. And if that energy is the underlying existence showing as infinite through the smallness of particles in space, then we also have a way to understand why the electrical charge is self-repulsive, and why the electrical energy of the particles would go to zero at infinity. They are simply the infinite showing through. And, finally, if that energy is the underlying existence showing as undivided, through the dispersion of the particles through space, then we even have a way to understand gravity and the attraction between positive and negative charges. They are simply the undivided showing through.

It is important to remember that the electrical energy of an electrical particle would go to zero if, and only if, the size of that particle went to infinity.

And it is important to remember that the gravitational energy of the Universe would go to zero if, and only if, the dividedness of the Universe went to zero. Electricity is associated with infinitude in this way, and gravity is associated with undividedness.

Now the interesting thing about hydrogen is that it is primordial; it is made of protons and electrons which *do not* arise by Parinama. They neither arise nor disappear by Parinama within the world of our physics. They are made out of gravity, electricity and inertia, which themselves arise by Vivarta. The rest mass of the protons is related to their separation from each other in the gravitational field, and to their smallness in the electrical field. And the rest mass of the electrons is related to their smallness in the electrical field and to their separation from the protons. Everything else in the Universe is made from that hydrogen by Parinama, driven by the revealing power of the Vivarta.

Now, since only gravity reads gravity and only electro-magnetism reads electro-magnetism, it is impossible to perceive the Parinama except from within it. If my body didn't have a gravitational field in which the Earth weighs one hundred and forty pounds, then I would not be able to notice that the Earth has a gravitational field in which my body weighs one hundred and forty pounds. Only gravity reads gravity. And since only electro-magnetism reads electro-magnetism, if my body weren't made of electrical particles, then seeing, hearing, and my other sense perceptions, all of which depend upon electrical interactions, would also be impossible. The Parinama, and the Vivarta which gives rise to it, can be perceived only from within it.

If there weren't the changeless, the infinite, the undivided underlying what we see; and if there weren't a Vivarta through the revealing power of which arise gravity, electricity, nuclear energy and inertia; then there would not be hydrogen falling together by Parinama to galaxies and stars. There would not be planets, plants, and animals. And there would not be people wondering about Vivarta and Parinama.

If, by diligent efforts, one can discriminate between the changeless and the apparently changing, between the infinite and the apparently finite, between the undivided and the apparently divided; and if, by diligent efforts, one can give up one's attachment to the consequences of transformational causation, that is, if one can give up that expectation, then one can be free of the Parinama and the Vivarta which gives rise to it.

As Shankara says, "Discrimination and renunciation are like the two wings of a bird in The case of a man. Without either one he cannot reach the creeper of liberation which grows, as it were, on the top of an edifice."

John L. Dobson
Hollywood

CLOUDS

Why are the clouds so flat on the bottom? That is the wrong question to ask. The flat bottom is just the boundary between the denser dry air below and the less dense wet air above. (The molecular weight of water is only 18. The molecular weight of nitrogen and oxygen are 28 (2x14) and 32 (2x16) because they both form diatomic molecules. So dry air is conspicuously denser than wet air and it stays near the ground while the wet air floats above it.)

But why are the clouds so lumpy on top? This is the right question to ask. It is because of the phase change of water. It takes 81 calories per gram of water to melt ice without any change in temperature. (A mixture of ice and water will stay at the freezing point until all the ice has melted.) Then it takes only another 100 calories per gram to bring the temperature up to a boil at sea level. (The boiling point of water varies with the atmospheric pressure. Water will not boil until the steam pressure is equal to the atmospheric pressure which at sea level on this planet is 15 pounds per square inch.) But then it takes another 540 calories to vaporize the water.

If it takes 540 calories to vaporize a gram of water, all that heat must come out again when the water vapor precipitates as droplets in a cloud. (Wet air is a mixture of water vapor and air. Steam is not a mixture. It is water vapor at or above the boiling point. When you look at the spout of a tea kettle on the stove, you can see through the steam at the spout. Only further out it forms a cloud. The reason steam burns are so damaging is because 540 calories of heat are released for every gram of water that condenses on your skin.) So the precipitation of fog, cloud, or rain warms the air. It's not cold in San Francisco because it's foggy; it's foggy because it's cold. And it would be colder without the fog.

The clouds are lumpy on top because the precipitation of the water vapor to cloud heats the air and causes it to rise. The faster a cloud dumps its rain, the faster it warms and rises. And the faster it warms and rises, the faster it dumps its rain. So if the cloud is very large and very wet then the air that comes in from below to replace the rising air in the rising cloud may blow your house away.

In the mountains the ground cools off at night by radiating. The heat energy is radiated away in the infrared to the night sky, and the air in contact with the ground cools off by this contact and flows downhill like water. That is why the clouds sometimes disappear at night. In the daytime, however, the ground is warmed by the sun and it heats the air in contact with it. So the warm moist air over the southwest slopes rises and then cools until the water vapor in it precipitates out as clouds. That is why one often sees clouds forming over the mountains in the afternoon. But at night when the cloud layer is lowered, to

replace the downhill breezes, the temperature and pressure rise and the clouds are vaporized.

By watching the edges of the clouds at dusk, to see if they are vaporizing, one can often tell whether or not the sky will clear at dark.

It is because the cold night air flows downhill like water that large night telescopes belong on the peaks and ridges of hills and mountains. And it is because in the daytime the warm air goes up the slopes that sun telescopes belong elsewhere...

When a balloon goes up into the air, the air inside it gets cooler because the molecules are colliding with a receding wall. It's like a baseball. When it's bunted, it slows down because it collides with a receding bat. (Temperature is a measure of the mean kinetic energy of the molecules; so if they collide with a receding wall and slow down, they cool off.) When the balloon comes down again, the air inside it heats up because the molecules are colliding with an advancing wall. It's like a baseball on a home-run pitch. It collides with an advancing bat. Air going up in this way cools off with or without a wall of a balloon because as the rising air expands its molecules collide with receding molecules.

CLOUDS – INSERT

Some years ago we had a hurricane that left some ten inches of water over North Carolina. Well, what happened?

What happened is that a very large mass of warm, wet air formed over the Gulf of Mexico where the ocean water is warm. Now since wet air is conspicuously less dense than dry air (because the molecular weight of water is only eighteen while the molecular weight of nitrogen and oxygen are twenty-eight and thirty-two), the great mass of wet air went up and migrated north. But as the wet air went up, it cooled off and some of the water vapor precipitated out as cloud. That's where the trouble began.

When water vapor precipitates out as cloud, or rain, it releases the heat of vaporization of that water into the cloud. Here we need some numbers. It takes eighty-one calories to melt a gram of ice without changing its temperature, and another hundred calories to bring it to a boil. But it takes nearly three times that much heat, five hundred and forty calories per gram, to evaporate the water to vapor. And all that heat comes back when the vapor precipitates out as cloud or rain. That's what causes the trouble.

As the wet air goes up and drips, it gets warm, so it goes up and drips some more, and it goes on like this till it runs out of water. It's not that the hurricane brought the rain; it's the rain that brought the hurricane, and it's this heat that brought the rain. Do you know how much heat it takes to evaporate ten inches of water over North Carolina?

And it's the air that comes in from below to replace the rising cloud that blows your house away, and the same Coriolis effect that throws you down sideways when you walk across the merry-go-round, blows the wind sideways when it comes in from below. That's because the Earth is spinning.

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COMPLEXIFICATIONS

Part I:

Pierre Teilhard de Chardin has laid great emphasis on a very important process which he calls "complexification". If I understand him correctly he suggests that Divinity "pulls us" toward Itself through this process of complexification. My question here is whether the personal interference of Divinity is required in this process or whether the "underlying existence" showing through in matter in living organisms is sufficient to pull the process to completion.

Although most modern cosmologists take non-existence for granted (that is, they want to get the Universe out of nothing), I am not willing to do so, nor was Teilhard. The question then arises: what would remain if we take existence for granted [instead] but leave out space and time? That is, what could exist in the absence of a Universe?

Heisenberg's Uncertainly Principle and Einstein's Special Theory of Relativity suggest that the world which we see in space and time is "apparitional". Einstein's 1905 equations show space and time as a pair of opposites. We actually see events "at a distance" by seeing them in the past – in just such a way that the real separation (the four-dimensional separation) between the Seer and the Seen remains at zero. Einstein also showed in 1905 what Swami Vivekananda had asked Nikola Tesla to show 10 years earlier (in 1895), namely that what we see as matter (mass) is just potential energy. Later, in 1926, Heisenberg pointed out that there is a *necessary* uncertainty associated with seeing things in space and time. The more we can know about where and when something is, the less we can know about what it is. All this suggests that the world which we see in space and time is actually "apparitional".

Now if the world is indeed "apparitional", then underlying it there must exist something which is not in space and time and which must therefore be Changeless, Infinite, and Undivided (not in time and not limited or divided by space). Since it must underlie the apparition it must still show through (just as the length and diameter of a rope shows through in the "snake" for which it is mistaken). What I am suggesting, then, is that the "underlying existence" must show through as attraction, repulsion, and inertia in the physical world – and as attachment, aversion, and the clinging to life in the world of the living.

I am suggesting that the primordial hydrogen of which the entire Universe appears to be made shows the changelessness of the "underlying existence" as inertia. It shows the infinitude as the electrical repulsion, kinetic energy and radiation. And it shows the undividedness as gravity and the attraction between opposites. Also, since the hydrogen is "apparitional" and must therefore

represent zero change in the Changeless, we have the Conservation Laws. Finally, since the Universe is seen in time and must therefore be changing even the particles themselves (the protons and electrons) have spin. So the question here is this: *Will the nature of the "underlying existence", through a process of "automatic complexification", pull the atoms and molecules to life? Will the "underlying existence" showing through in living organisms as attachment, aversion, and clinging to life pull the saints to final Beatitude?*

First of all let me point out that sentiency is in this from the word "go". All matter discriminates up from down. All the electrical particles discriminate plus from minus and spin up from spin down. There is *always* a Perceiver and a Perceived and sentiency is in it from the word "go".

Now even if the Universe started as nothing but hydrogen it would nevertheless fall together by gravity to galaxies and stars. And, by processes now thoroughly understood, it would "complexify" into other chemical elements in the stars and in the stellar explosions which scatter the chemical elements far and wide. Then, through the discrimination of plus from minus and spin-up from spin-down in the interstellar clouds and on the surfaces of planets, these chemical elements would "complexify" into molecules. Once again by processes which are thoroughly understood.

Subsequently, through molecular discrimination on the surfaces of planets (and by processes *not* thoroughly understood), the molecules appear to "complexify" into life.

Now at this point we have a very interesting threshold, as Teilhard would call it, between the non-living and the living. A living organism must direct a stream of negative entropy upon itself to stay alive and that requires an "egoistical discrimination" quite unlike the discrimination built into the hydrogen.

As I said, this process is not well understood. But it is easy to see that egoism is a genetic invention to keep a living organism alive. The genetic discriminations of the ego are required for the direction of a stream of negative entropy upon the organism. It is these discriminations that take the form of attachment, aversion, and clinging to life.

If attachment, aversion, and clinging to life are simply the genetic equivalents of attraction, repulsion, and inertia seen in matter, (because the undividedness, the infinitude, and the changelessness of the "underlying existence" must show through), then the genetic "complexifications" may also be considered to be automatic.

The "complexification" of the genetic organisms is driven by changes in the environment and imposes "complexification" on the genetic discriminations.

The "complexification" of the genetic discriminations of the single-celled organisms makes possible the genetic invention (if you like) of poly-celled organisms. And this is another Teilhardian threshold, but one which is fairly well understood.

It is important to bear in mind at this threshold that for simple poly-celled organisms like the sponge the "complexification" of the poly-celled organism itself is primitive compared to the "complexification" of the individual cells of which it is composed. It is also important to bear in mind that the response of the poly-celled organism to gravity, kinetic energy (temperature), radiation, electricity and magnetism, depends on the responses of the individual cells to these same forms of energy. And also bear in mind that the responses of the cells depend in turn on the responses of the atoms and molecules of which the cells are made. As I said earlier, sentiency is in this from the word "go".

Notice at this point that for poly-celled organisms like us the ego of the poly-celled organism shows no recognition of the "egos" of the individual cells of which the poly-celled organism is composed. And this is in spite of the fact that at the time of conception of each one of us there once was a one-celled organism without a brain.

Over a rather long period of time environmental changes have "complexified" the poly-celled organisms and therefore the genetic discriminations which they are required to make.

One of the reasons that poly-celled organisms have become so enormously complex is that the "improved" genetic programming is usually built on top of the previous programming without an "eraser". That is, without a mechanism for removing what went before. This leads automatically to "complexification". It may be possible through neoteny to cancel the last things written in the genetic programming and replace them with new programming, but usually the new programming is superimposed on top.

Through what has come to be called "natural selection" the environmental changes on the surface of this planet have imposed bewildering sequences of genetic "complexifications" on the poly-celled organisms.

It appears to me that both memory and intelligence must arise through the "complexification" of the egoistic discriminations of which are driven by natural selection. And the question which arises here is whether the genetic "complexifications", like the atomic and molecular "complexifications" before them, are driven simply by the nature of the "underlying existence" showing through in space and time?

Part II:

It may already be obvious that the genetic "complexifications" heretofore discussed are sufficient to require the invention of memory and intelligence. But what may not be so obvious is what drove the particular sequence of "complexifications" which caused Alfred Russell Wallace to wonder where the personal interference of Divinity might not be required to explain the evolution of the human brain. He considered this quite mysterious.

I have also to wonder whether it might not have been this same mystery which raised in Teilhard's mind the notion of the Omega Point toward which he felt Divinity was pulling us as a race.

Through the penetrating insights of the late Sir Alaster Hardy, Desmond Morris, Elaine Morgan, and others, this mystery has recently been largely cleared up. It appears now that some 5 or 10 million years ago our jungle-swinging ancestors were probably marooned on an island in Northeast Africa by the rise in the ocean level consequent on the melting of the polar ice caps.

This rather sudden and sever environmental disruption, if you like, when we exchanged the jungle for the seashore, imposed on our chimp-like ancestors the need for rapid genetic "complexification" because the food was now underwater at the beach. Not only was it underwater; its availability depended on the phases of the moon.

One of the "complexifications" which we built-in at that beach was what is called "neoteny", the carrying over into later life of juvenile characteristics. I sometimes wonder whether it might have been because the adults showed more willingness to carry the juveniles on their backs when they walked out into the water at feeding time if the juveniles showed more pronounced juvenility. At any rate, neoteny allowed us to prolong and thus extend the growth of the frontal lobes of the brain. This extension would have been furthered by the use of tools and language; tools for breaking shells and speech because body language failed in the surf.

It is perhaps a presumption on my part that since neoteny, braininess, and speech became species characteristics, they would have been picked out at mating long after we returned to mainland Africa a few million years later.

It may also be a presumption on my part that these "complexifications" were built-in rather quickly because the population was very small.

Note that neoteny allows a sort of "eraser" if the new genetic programming is put in before the operation of the complete adult programming.

Perhaps at this point I should point out that juveniles do *not* follow the prime directives of the genetic programming. They neither direct streams of negative entropy upon themselves nor pass on the genetic line. Their parents do it for them. I believe that it was the extension of this immunity through neoteny, along with the extension of our juvenile curiosity which was largely responsible for the growth of science and religion and our human state.

Most complex organisms, such as us, follow headlong the suggestions of our genetic programming. But in our case, through neoteny and the "complexification" of the brain, we have the ability to "say no" to a genetic impulse. And partly because each of us has a history of childhood, when the prime directives of our genetic programming were inoperative, we have the ability to see through the genetic "apparition" to the "underlying existence".

We have the ability, while following the genetic promptings, to notice that the fulfillment of a genetic necessity does *not* confer on us the fulfillment of the yearning that drives it.

Through marriage we do not reach the Undivided, nor through sleep the Changeless.

As I see it, this discrimination between the promptings of the genetic programming and the fundamental yearning for the Changeless, the Infinite, the Undivided which drives them is the beginning of religion.

If this discrimination between the "underlying existence" and the "genetic apparition" can take the saints to final Beatitude then we may not need to invoke the personal interference of Divinity.

However it has also been found that among the saints there are two prevailing points of view: some see the "underlying existence" as Impersonal and some others see it as Personal.

If the "underlying existence" is seen as Impersonal then the "complexification" may appear automatic. Whereas if the "underlying existence" is seen as Personal then this entire series of "complexifications" maybe seen as directed.

1995

Complexifications

I.

Pierre Teilhard de Chardin has laid great emphasis on a very important process which he calls complexification. And if I understand him correctly, he suggests that divinity pulls us toward itself through this process of complexification. My only question here is whether the personal interference of divinity is required in this process, or whether the underlying existence showing through in matter and in living organisms is sufficient to pull the process to completion.

Although most modern cosmologists take non-existence for granted (that is, they want to get the Universe out of nothing), I am not willing to do so, nor was Teilhard. The question then arises: what would remain if we take existence for granted but leave out space and time, i.e., what could exist in the absence of a universe?

Heisenberg's Uncertainty Principle and Einstein's Special Theory of Relativity suggest that the world which we see in space and time is apparitional. Einstein's 1905 equations show space and time as a pair of opposites. We see events at a distance by seeing them in the past, and in just such a way that the real separation (the four dimensional separation) between the seer and the seen remains at zero. Einstein also showed in 1905 what Swami Vivekananda had asked Nikola Tesla to show ten years earlier, namely, that what we see as matter (mass) is just potential energy. And by 1926 Heisenberg had pointed out that there is a necessary uncertainty associated with seeing things in space and time. The more we can know about where and when something is, the less we can know about what it is. All this suggests that the world which we see in space and time is apparitional.

Now if the world is indeed apparitional, then underlying it there must exist something which is not in space and time, and which must therefore be changeless, infinite and undivided (not in time, and not limited or divided by space). And since it must underlie the apparition, it must show through (just as the length and diameter of a rope show through in the snake for which it is mistaken). What I am suggesting. then, is that the underlying existence must show through as attraction, repulsion, and inertia in the physical world, and as attachment, aversion, and the clinging to life in the world of the living.

I am therefore suggesting that the primordial hydrogen, of which the entire Universe appears to be made, shows the changelessness of the underlying existence as inertia, and that it shows the infinitude as the electrical repulsion, kinetic energy and radiation, and the undividedness as gravity and the attraction between opposites. And also, since the hydrogen is apparitional and must therefore represent zero change in the changeless, we have the conservation laws. And finally, since the Universe is seen in time and must therefore be changing, even the particles themselves (the protons and electrons) have spin. So the question here is this: *Will the nature of the underlying existence , through a process of automatic complexification, pull the atoms and molecules to life, and will the underlying existence showing through in living organisms as attachment, aversion, and clinging to life, pull the saints to final beatitude?*

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the nature of the underlying existence showing through in space and time.

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It may also be a presumption on my part that these complexifications were built in rather quickly because the population was very small.

And neoteny allows a sort of eraser if the new programming is put in before the operation of the complete adult programming.

Perhaps at this point I should point out that juveniles do not follow the prime directives of the genetic programming; they neither direct streams of negative entropy upon themselves nor pass on the genetic line. The parents do it for them. I believe it was the extension of this immunity through neoteny, along with the extension of our juvenile curiosity, which was largely responsible for the growth of science and religion and our human state.

Most complex organisms such as ourselves follow headlong the suggestions of the genetic programming. But in our case, through neoteny and the complexification of the brain, we have the ability to say no to a genetic impulse. And partly because each of us has a history of childhood, when the prime directives of the genetic programming were inoperative, we have the ability to see through the genetic apparition to the underlying existence.

We have the ability, while following the genetic promptings, to notice that the fulfillment of a genetic necessity does not confer on us the fulfillment of the yearning that drives it.

Through marriage we do not reach the undivided, nor through sleep, the changeless.

As I see it, this discrimination between the promptings of the genetic programming and the fundamental yearning for the changeless, the infinite, the undivided which drives them is the beginning of religion.

If this discrimination between the underlying existence and the genetic apparition can take the saints to final beatitude, we may not need to invoke the personal interference of divinity.

However, it has been found, that among the saints there are two prevailing points of view: some see the underlying existence as impersonal, and some see it as personal.

If the underlying existence is seen as impersonal, the complexification may appear automatic. Whereas, if the underlying existence is seen as personal, this entire series of complexifications may be seen as directed.

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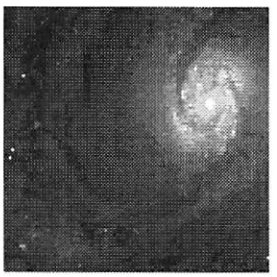

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CONDENSATION and DISPERSION

More than half a century ago someone suggested to me that energies might be divided into two categories, energies that cause matter to condense and energies that cause matter to disperse. We may call them condensational and dispersional energies. Still, condensation and dispersion of what? I thought he was crazy. But afterwards, when I thought it over, I suspected that he might not be crazy.

First I thought that gravitational energy must be condensational, and that when it causes condensation it becomes kinetic energy which must, therefore, be dispersional. But then I thought that if you shoot a bullet toward the ground the kinetic energy produces condensation. Oh no! If the bullet is going *toward* the Earth, the kinetic energy is going *up*, not down. So kinetic energy *is* dispersional, and since radiation is picked up as kinetic energy, without producing dispersion, it must also be dispersional.

So then I thought that when condensational energy produces condensation, it becomes dispersional energy. And that when dispersional energy produces dispersion, it becomes condensational energy, as we see it in a swinging pendulum. And the total energy remains constant. Then I thought that electrical energy must be dispersional, and that we must be talking about the condensation and dispersion of nucleons only, protons and neutrons, not electrons.

It would seem, then, that the total gravitational energy of the Universe must be the same thing as its total electrical energy, and that we see things spaced *out* against gravity by seeing them spaced *in* against electricity.

The question then arose: *Can we consider electricity as a three dimensionally dispersional, gravitational field?* Do we have an example of a dispersional, gravitational field? Then I thought of the merry-go-round. Couldn't we consider it a two dimensional, dispersional, gravitational field with a Coriolis effect? *Could magnetism be the Coriolis effect of the three dimensionally dispersional, electrical field?* Like the Coriolis effect, the magnetic field is perpendicular to the direction of motion, and proportional to the speed.

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CONNECTING THE MAPS

[Lecture delivered to the Vedanta Society of Southern California, Sunday, December 10, 1978]

Let me begin with a quote from Plutarch: "*All becoming has two causes, of which the most ancient theologians and poets chose to turn their attention to the stronger only, pronouncing over all things the universal refrain: 'Zeus first, Zeus middle, all things Zeus', while they never approached the necessary or physical causes. Their successors, called Physikoi (the physicists), did the very reverse; they strayed away from the beautiful and divine principle and refer all things to bodies, and impacts, and changes, and combinations.*"

I want to talk about both kinds of causation.

Swami Ashokananda once said that Vedanta is like a great department store. There are all sorts of items for sale there, items to suit almost every need. You go; you buy what you need. It is not required that you buy everything in the store... However, there are certain things that have been, in my opinion, dishonestly advertised, and I feel that the shelf displays need some touching up, and among those items which have been wrongly presented are the three *Gunas* and the Five Elements. But first I need to present the problem.

Suppose we just consider the present situation. You see somebody here, an embodied being, moving and talking. The question is: Of what are these bodies made? Of what is all this made?

Well, the chemists will give you a real quick answer. They will tell you that they are made of a very few ingredients. There are only about 92 things out of which this visible world is made, and these bodies are made of only a handful of those 92. It is really not an awful lot of things; hydrogen and oxygen and carbon and nitrogen and a few other things in smaller amounts. Now where do they come from?

They come from the stars. That is to say, all - except hydrogen - are derived from hydrogen in the bellies of the stars. Hydrogen falls together by gravity in a star like our Sun – well, let's take a larger star, not one like our Sun. Let's consider a larger star because the other chemical elements that get scattered around here, out of which our bodies are made, are not made in stars like our Sun. Our Sun will make helium out of hydrogen, and carbon out of helium but that's probably as far as it will go. Regardless, larger stars make a whole lot of other things with larger chemical nuclei up to the size of iron. When the centers of those of those stars are [fully turned into] iron, those centers collapse by gravity and the outer portions are blown away by the energy released in the collapse. Out of those things we are made. That is to say, out of those things our bodies are made.

All of those things were made out of hydrogen by what I call "transformational causation". The hydrogen goes to helium, the helium goes to carbon, the carbon goes to oxygen, then to neon, magnesium, and so forth and all of this is done by "transformational causation" and we understand the process very well.

"Transformational causation" is governed by the Conservation Laws. For example, in any transformation, the energy at the end is never more than the energy at the beginning. However, the [primordial] hydrogen does not arise by "transformational causation". It cannot arise by "transformational causation".

Hydrogen is made of energy, and energy cannot arise by the transformation of energy. Hydrogen is made of electrical particles, and those particles do not arise by the transformation of something else. These electrical particles fall together by gravity but the gravity does not arise by "transformational causation". The electrical particles also have inertia, and the inertia does not arise by "transformational causation".

Now this really is the big problem in human knowledge. We have understood for a long time how "transformational causation" goes. We start with certain ingredients and end up with something else. The Sun begins as hydrogen and ends up as carbon. The great question is: How do the original ingredients arise?

Instead of taking the materials out of which it is made, let's take the energies. It is obvious that I am moving around and my lips are moving. All this is done on some kind of energy. When we look at the kind of energy we find that it is chemical energy. It comes from eating. There is a story on that.

Swami Shantaswarupananda, when he first came to this country, wouldn't eat well. He just ate the teensiest amounts, like Swami Pavitrananda. I was supposed to feed him and to see that his diet was properly nutritious, but he would not eat it. Swami Ashokananda went upstairs to scold him one day and said, "All energy comes from food. Spiritual energy also comes from food. The more you eat, the more spiritual you are." (Laughter).

Well, this energy by which we move these bodies around is actually "canned sunlight". It is chemical energy now. We get it by eating potatoes and wheat grains and corn and by drinking milk and by eating cows and chickens and various other things. But the energy that they have comes from the Sun. The energy changes from one form to another without any change in the amount. The plants hold out their hands and catch the sunlight. They pick up carbon dioxide with their hands and water with their feet, and there are a few other minerals thrown in, but that's not where the energy comes from. The energy comes from the Sun. So when we eat these things we oxidize them back to

carbon dioxide, water, and sunlight. After we are through with them they are once again carbon dioxide and water, and we run around on the canned sunlight.

So all this that you see moving here is moving on canned sunlight. Even these lights that burn here are burning on canned sunlight. The Sun puts water up in the sky, we catch it in the mountains, run it down through these big turbines, and we cause the electrons to flow through these wires. But it is canned sunlight.

Now where does the Sun get its energy? Now you see we are tracing it back. We are tracing it back to its source. It is chemical energy here and that [means that it] is electromagnetic energy. But formerly it was radiational energy coming from the Sun. The energy that the Sun radiates away, in the state before it radiated it away it was kinetic energy.

How did the Sun get its kinetic energy? How did it get so hot? It got hot by falling together by gravity. Now, once again, this is all "transformational causation". We start with certain ingredients and end up with something else, something which looks very different, not by any change in the amount of energy but only by a change in form. From gravitational energy it goes to kinetic energy then to radiation then to electrical and magnetic energy and [finally] we move around. All this is "transformational causation". The energy changes in form but not in amount, and these other forms of energy come from gravitational energy by this transformation. However the gravitational energy does not arise by transformation. Now there is the problem, you see. All the chemical elements besides hydrogen arise from hydrogen through this kind of causation. All these other energies arise from gravitational energy by this kind of causation, but neither the hydrogen nor its gravitational energy can arise in that way.

These five kinds of energy that I just listed are also the Five Great Elements of antiquity. They just need to be properly dusted off and re-translated into English.* The present translation, which is probably in all the books on these premises, including the Sanskrit dictionary, has *Akasha* translated as "ether". But the notion of "ether" left physics in 1905 and it is high time somebody noticed

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*__Akasha__, usually translated as "ether", is the gravitational energy of matter dispersed in space. The word also means "space". The gravitational energy is in the space of the dispersion. Our orientation in the gravitational field is perceived through the Saccule in the inner ear.
__Vayu__, usually translated as "air", is kinetic energy. Matter dispersed in space falls together by gravitational energy which is converted into kinetic energy (due to friction) and is sensed as temperature by the skin.
__Tejas__, usually translated as "fire", is that which shines. The excess kinetic energy (heat energy) of a condensing star is lost to the surrounding space as the energy of its radiation. It is radiation which is perceived through the eyes.
__Ap__ and __Prithivi__, usually translated as "water" and "earth", are electricity and magnetism. The presiding deities of Ap and Prithivi were said to be twins. Electricity and magnetism go together. You cannot have one without the other. Electricity and magnetism are perceived through the tongue and the nose. Protons taste sour, and the molecular configurations perceived through the nose are magnetic.

that and re-did the translation. "Ether" will not do. There is no such animal. Now to translate that fine Sanskrit word as "ether" is, in my opinion, dishonest advertising. If we are to be honest in this department store of Vedanta we should advertise the wares satisfactorily.

The notion that there are five great forms of energy is an old, old idea. In the Upanishads we find the statement that "From *Brahman* arises *Akasha*. From *Akasha* arises *Vayu*. From *Vayu* arises *Tejas*. From *Tejas* arises *Ap*. And from *Ap* arises *Prithivi*." These are the Five Great Elements of antiquity, usually translated as ether, air, fire, water, and earth. But you may skip all of those [incorrect] translations.

The first energy is gravitational energy. It then goes to kinetic energy, that goes to radiation, and that goes to electricity and magnetism, which are said to be twins. They really are twins. Those people had it straight – very, very straight – and a very long time ago.

Those five energies are said to be perceived by our five senses. *Akasha* is said to be perceived by the ear. The ear has three kinds of sensations and the oldest one, the saccule, senses our orientation in the gravitational field. Now in all our books the first element will be translated as "sound". But the Universe does not arise from sound. Not only that, but sound arises from transformation and not by the "first cause" or *Prakriti*. By the "first cause" (from ***Brahman***) ***Akasha*** rises. It is **gravitational** energy. From that arises an energy, ***Vayu***, which is perceivable by the skin. That is **kinetic** energy. Temperature is a measure of kinetic energy. From that arises ***Tejas***, "that which shines". It doesn't mean fire, it means that which shines. It means **radiation**, some of which is perceivable by the eyes. From that arises **Ap** and **Prithivi**, which are **electricity** and **magnetism** which is perceivable by the tongue and the nose. Protons taste sour. The raw ingredients of the Universe, that is to say the heavy ones, the protons, the nuclei of hydrogen atoms, taste sour. Nothing else in this Universe tastes sour. So electricity is what we taste with the tongue. The nose perceives molecular configurations and that is a magnetic problem. That's complicated and I am not going to go into it, but the magnetic pairing of the electrons is what holds the molecules together; so the structures are really magnetic structures and those structures we perceive by the nose.

Now you see this is really our problem. We can trace the material of these bodies and the materials of all this stuff that we see with our eyes back to hydrogen. It is perfectly easy; we know all the details now. But we have no way to get to the hydrogen, the original material. It cannot arise by "transformational causation". Similarly, we can trace all these energies back to the energy of gravitation, but we have no origin for the energy of gravitation. We have no origin for the electrical particles which make up the hydrogen, no origin for gravitation, and no origin for inertia.

This problem, the problem of the "first cause", was handled a long, long time ago by some "physicists" in Northern India, probably some 5,000 years ago. Probably somewhere between 2,000 and 3,000 B.C. these things were thought out very carefully in North India – but not by the Aryans. We think, you see, when we think of India, that it has been inhabited by Aryans all along. That is not so. This was probably done by the people who planted rice. Now the "rice people", the people who invented the planting of rice, were in India long before the Aryans came, and there is even another batch of people called the Pre-Aryans. They also came before the Aryans. So these old, old people, the Proto-Australoids, probably Rama's people, were there some time around 3,000 B.C. planting rice, and apparently they invented this worship which we do with five ingredients – not the Aryans. It was much older than that, and they apparently discussed these different kinds of energies and noticed that there are five different kinds associated with our five senses of perception. This is perfectly straight physics, perfectly straight astronomy.

There is only one other kind of energy that we know about [today] in this Universe and that is nuclear energy, but that is a very different kind of energy. It has to do with the Uncertainty Principle. "Ordinary" energies are five, and we do perceive them with our five senses. Not only do *we* perceive them. Even one-celled organisms perceive them, and even the atoms themselves perceive them. That is, the atoms themselves respond to these same five forms of energy. There is no use saying "suppose we had another sense then the Universe would appear differently". No, we have the right number now. That's all the energies there are to see. We don't have to fool around with more dimensions either. That is not the problem.

The problem is to understand how this hydrogen arises since it does not arise by "transformational causation".

Now the notions that are current in the minds of people when their language gets codified get embodied in the language, and Sanskrit was codified in India. It comes from that line of languages called the Indo-European languages, related to Greek and Latin and a whole lot of other languages, but Sanskrit was codified in India. The reason we know that is because of the animals that are associated with the early language. When you hear about Peacocks and Tigers you understand that you are in Bengal. You are not in Greece – they don't have Peacocks. (Laughter.) It is the same as Little Black Sambo. You see, when I was a boy I always thought that Little Black Sambo was an African boy. It wasn't until I was quite grown up that I noticed that he was associated with Tigers and melted butter. Now Tigers and melted butter are in India and Little Black Sambo is Little Black Shambhu. Shambhu is the name of Shiva, and it is not an African story at any time. You see I had to be quite grown up to notice this. We take things for granted.

We now know that the Sanskrit language was codified in India. In that language we now have those ideas from the Proto-Australoids who grew rice and did all these worships and studied the Five Elements and all those interesting things. What happened, apparently, was that the Aryans entered India, probably some time around 2,000 B.C. They gradually fell deeply in love with what they found there when they came and put it into Sanskrit. By diligent efforts of memory lasting several thousand years they have passed it down to us. Some of it has been passed down so long that the [original] meanings have been lost. For example, the entire Indian nation thinks that this Universe arises from sound. But that is wrong. They have even designated the sound: it is Aum.

The energies of this Universe do not arise from sound. Sound arises by transformation. The energies of this Universe are first gravitation, then kinetic energy, then radiation, electricity and magnetism. The important point to notice is this: the "first cause" – which we are here to discuss – gives rise to gravitational energy. That is, as the Upanishad says, "From *Brahman* arises *Akasha*." All the rest of the "arisings" are by transformation.

Now those old notions were put into Sanskrit and passed down to us largely in the form of the Upanishads. There may be some older texts in the Vedas than the Upanishads, but mostly these things were passed down in them.

Later on people had to see if they could systematize the teachings of the Upanishads and that is where these famous six systems of philosophy arose – *Sankhya* and *Yoga*, *Vaisheshika* and *Nyaya* or *Purva Mimamsa* and *Uttara Mimamsa* or *Vedanta*. All these things arose in an effort to put the teachings of the Upanishads in order.

Those books are very disorderly. They consist of the blurtings of people who saw things – that's all. "*Na tatra suryo Bhati na Chandra tarakam...*" ("Not there the Sun shines nor the moon, nor star; there the lightning does not flash, how could this fire?") – It is like that. They are just sudden statements of somebody seeing something. "Those who know the high *Brahman*, the Vast, hidden in the bodies of all creatures and alone enveloping everything as the Lord, they become immortal. I know that great *Purusha* of sunlike luster beyond the darkness. A man who knows Him truly passes over death; there is no other path to go."

It does not sound like a school book. Nobody sat down there and tried to organize this stuff. They simply saw things, experienced things, and let them come out through the mouth. Somebody heard it and memorized it. Somebody heard it and, fortunately for us, memorized it and taught it to their children, and their children, and their children for several thousand years. Nowadays we have them printed up. They are not in such danger of being lost. But whole hosts of those things did get lost. Probably we have saved not more than a few percent

of those things that those old Rishis said. We don't even know who they were. We only know something about what they saw and what they said.

Sankhya is considered to be the first systematization of those Upanishads, of the thoughts that have been passed down in the Upanishads. The Sankhyans taught entirely "transformational causation". They did not have the basic understanding by which they could even understand the language of the Upanishads. I do not like to insult people like this but it is a very important point. We are here talking about the *Gunas*, and the whole notion of the *Gunas* is completely disconnected from "transformational causation".

It is probably wrong to think that the Sankhyans used the *Gunas* first. They occur in the Upanishads, and in their proper context, but in *Sankhya* they think of the *Gunas* as "things" and do chemistry on them – a little bit of this and a little bit of that and we will make something. No! That is not what the *Gunas* are about. The *Gunas* are about some entirely different kind of causation.

The Sankhyans say that *Prakriti* is the "first cause". The word means first cause. It comes from *Pra*, "first", and *Kri*, "to do". They say that the "first cause" is made of three *Gunas*. So far they are perfectly right. But what is the nature of this "first cause"? By what kind of causation can you get from *Brahman* to hydrogen dispersed in space and falling together in its gravitational field?

You see it is really a very hard thing to understand. From a completely Formless, completely Changeless, Infinite, Undivided *Brahman* you get what we [actually] see. What we see is quite a bit divided – divided into atoms. What we see is quite a bit finite – teeny, weeny electrical particles. And it is quite a bit active – falling together by gravity into galaxies and stars.

Now you see when we say that *Brahman* is Changeless we say it because we see things in time. What we mean is that *Brahman* is not in time. And when we say that *Brahman* is Infinite we mean that it is not in space. What we see is in space.

Now this business of seeing things in space and time is wrong. We know it now from our physics. Since 1905 we have gradually come to understand, even from our physics, that the notion of seeing things away from us in space and backwards in time is wrong. The Universe appears in such a way that we see the whole thing in the past. We cannot see anything when it happens. It is only by seeing things late that we are able to see them away from us.

The equation of separation in Einstein's Relativity Theory puts the separation between the Perceiver and the Perceived at zero. We see events away from us in space by a trick – we see them backwards in time. If you are talking about an event of your perception, and the event that that event perceives, then the separation between those two events is zero.

For example, suppose you see a flash of light from a star. We will call that an event. Your perception of that event we will call the second event. The separation between those two events is zero.

If you can see the event "there-then" from the event "here-now" then the separation between those two events is zero, because in that case, always, the distance away is exactly balanced by the time in the past. And, since space and time are opposites, if the distance away is exactly equal to the time in the past, then the separation is zero.

If the money you put into the bank is exactly equal to the money which you take out of the bank, then the change in your bank balance is zero. If the number of positive electrical charges which you have in a box is exactly balanced by the number of negative electrical charges which you have in that same box then the total electrical charge on that box is zero. That is what we mean by opposites – two things are identical and yet in some sense opposite, so that if you have the same amount of both it is like having none of either.

Space and Time are opposites in that sense. They are both dimensions and they both come into the equation of separation. Relativity Theory has pointed out in completely unambiguous terms that a distance in space is not a "real" thing. It is *not objective*. People will disagree on distances measured in space according to how fast they are going by. Lengths of time are also *not objective*. There is no such thing as an hour. What you call an hour and what an astronaut flying by in a spaceship at a speed close to the speed of light will call an hour are very different things.

What Relativity Theory pointed out is that it is the combination of space and time which has some semblance of objectivity. If you want to see the Universe as objective – that is to say, as independent of the observers – then you must see it in 4 dimensions: 3 dimensions of space (right and left, front and back, up and down, all perpendicular to each other) and 1 dimension of time.

The equations say that space and time are opposites in that very interesting sense such that between two events, say between "here-now" and "there-then", if the distance between here and there is equal to the time between now and then, then the *total separation* between the event "here-now" and the event "there-then" is zero. It is a very important point because every event that you see, you see away from you in space and backwards in time. In every instance the distance is equal to the time so that the total separation, the 4-dimensional separation, the *objective separation* between the Perceiver and the Perceived, always goes to zero.

Now if we ask what is behind this, if we ask – from our physics – what is behind what we see, then it says right away that what is behind it is beyond

space and beyond time. That is what we mean when we say Undivided, Infinite, and Changeless.

Undivided means that it couldn't be in space. With space you can see things as divided. Without space you cannot see them as divided. With space you can see things as small. Without space you cannot see them as small. With time you can see things as changing. Without time you cannot see things as changing.

When we say that the nature of the Reality is Infinite we don't mean that it is bigger than space. (Laughter) What we mean is that It has nothing to do with space. Space is simply a mistake in our perception.

When we say the nature of the Reality is Eternal we don't mean that it lasts longer than time. What we mean is that the Reality is completely devoid of our concepts of space and time.

When we go to describe the Reality, Brahman, we find it is totally indescribable, so we grope. From the standpoint of space and time we point the finger. We say "if". If it is beyond space it is Undivided. If it is beyond pace it is Infinite. And if it is beyond time it is Changeless.

That much description of Brahman we can get from physics – that what is behind this Universe of physics is Changeless, Infinite, and Undivided. Now we see it as divided – very finely divided into atoms, and nobody ever understood why. And we see it squeezed down to these minute electrical particles and nobody ever understood why. Einstein said, "We cannot understand, theoretically, why matter should appear as discrete electrical particles." And we see this thing as changing, and, once again, no one ever understood why. By no one, here, I mean no modern physicist has ever understood why what we see should be divided into atoms, made of discrete electrical particles, moving, falling together by gravity and yet resisting every change in its state of motion.

You see how crazy it is. It wants to fall together by gravity, it wants to fly apart by electricity, and it wants to remain totally stationary. (Laughter) Well, you laugh but you are no different. We do exactly the same thing. We want to be totally in love, totally free, and totally alone. (Laughter) We fall in love; we get married. But then we find that our freedom is gone, and we want out. And once again we are lonely. And then we want in, and we get out, and all the time we say, "Leave me alone!"

The Universe is made out of frustration. There is nothing accidental about it. It is made out of frustration because we see the Universe by a mistake. We see it in space and time by a trick – by a mistake.

Now these old people, either the Mohenjo-Daro people, or, more likely, the earlier Proto-Australoids, probably had this figured out. We don't know how long ago it was figured out that this whole thing is seen by a mistake.

The kind of causation by which we see this is a causation by mistake – what we call "apparitional causation" – the kind of thing that you do when you mistake a rope for a snake. Nothing happens to the rope. But when you mistake a rope for a snake, three things are necessary. First, you fail to see the rope rightly. This is the "veiling power" of Tamas. Secondly, you see the rope as something else. Now this "else" is the "projecting power" of Rajas. And then, thirdly, you saw the rope in the first place, otherwise you could not have mistaken it for a snake. You didn't mistake some other thing for a snake. You mistook the rope for the snake because you saw the rope. This is the "revealing power" of Sattva.

The mistake is not made a midnight and it is not made at noon. In the Sanskrit books it is specified that it is done in the twilight, as probably you are all aware. Why? Because you do have to see the rope, but you must not see it properly.

Now the veiling power of Tamas, the projecting power of Rajas, and the revealing power of Sattva – that is where the notion of the three Gunas arises, in connection with the "first cause", Prakriti, or Maya. The Vedantins say that Maya is made of three Gunas. The Sankhyans say that Prakriti, the first cause, is made of three Gunas. But the notion of the three Gunas arises here, and not in transformational causation. Sankhya took the whole thing the wrong way. They went down their entire cosmology building everything out of the Gunas. But nothing is built out of a Guna. Nowadays you will find in most Sanskrit literature that Rajas is activity. No. There is no mention in the Sanskrit dictionary of any activity in relation to Rajas. It is an impurity, the notion of an impurity, like smog. If you are talking about the sky, smog is there, that is Rajas. If you are talking about a field and it is all grown with grass that is fine. But if you plow it and make it all dusty that has to do with Rajas. If you have nice, clear water that is fine, but if you put something in it, that's Rajas. It's an impurity – it's seeing something else.

I even hear such extravagant notions as "matter is Tamas, energy is Rajas, and consciousness is Sattva." Erase! Erase! There is no such animal. Matter is made out of energy. Matter is energy. We learned that from Relativity Theory. There are not two different things called matter and energy. It is just, once again, a mistake in our perception. So there is no use trying to use the Gunas for things like that.

The Gunas arise in "apparitional causation". When you mistake one thing for another you fail to see the thing rightly because of the veiling power of Tamas. You jump to the wrong conclusion because of the projecting power of

Rajas. But first of all you did see the thing by the revealing power of Sattva. For instance, if you mistake a rope for a snake you do see the length and diameter of the rope, but you see it as the length and diameter of a snake. Now the curious thing is this, that if you mistake the Changeless, the Infinite, the Undivided for the changing, the finite and the divided, you still had to see the Changeless, the Infinite, and the Undivided first, last, and always. This is because really there is nothing else to see.

The Changeless, the Infinite, the Undivided has to show up in our hydrogen, just as the length and diameter of the rope must show up in the snake. If you see the reality as divided into atoms, then the atoms will all come back together like a stretched rubber band by gravity. Gravity is the Undivided seen in the divided. Electricity is the infinitude seen in the finite. Inertia is the changelessness seen in the changing.

The more squeezed down into tiny electrical particles that you see it, the more electrical energy those particles will appear to have. The more spaced out those particles appear, the more gravitational energy those particles will have. Finally, the faster you see the particles moving, the more inertia they will appear to have. Now this is what the Universe consists of. We see it as divided into atoms but falling together by gravity. The undividedness has been seen. We see this as made of minute particles and yet every one of them is electrical – they want to become infinite. As Swami Vivekananda once said, "The whole Universe is not big enough for even one particle."

Everything tends toward infinite dispersion. Everything tends toward infinite condensation. And everything tends to resist every change in its state of motion. Everything in the Universe runs toward the Changeless, toward the Infinite, toward the Undivided. There are no other goals. There is no mechanical Universe driven from behind. No. The whole thing is driven from the front.

Hydrogen is driven toward all other hydrogen in the Universe because the reality is Undivided. The electrical particles are driven toward infinite expansion because the reality is Infinite. And all matter is driven toward resisting every change in its state of motion because the reality is Changeless.

Now hydrogen atoms are very direct. If you let them go, they will fall straight toward the closest blob of matter – no fooling around. (Not that anything comes of it. Nothing reaches the goal through transformational causation.) Unlike the hydrogen, we are indirect. We have egos which are genetically invented and genetically mis-programmed to run in roundabout ways. We run after the Undivided, the Infinite and the Changeless, but not by directly falling to the ground and such things. Instead we run at the dictates of the genes to undertake transformational actions – actions by transformational causation – to do the bidding of the genes. That is, we do actions which give rise to viable offspring. We are programmed that way. The whole notion that this is a building,

that these are lamps – these are genetic notions. Our ego itself is genetic and the programming of the ego is genetic. We are identified with a piece of matter called the body and the whole thing goes on from there. But you see it is not possible to get anything out of it. It is made out of frustration and you can never get anything out of it.

If we had gotten into this dilemma by transformational causation we could get out by transformational causation. If we had gotten into this by walking too slowly we could get out by walking a little faster. But we didn't get in by walking. If we had gotten into this by talking naughty things we could get out by sweet talk. But we didn't get into this by talking. We didn't get into this by any action whatsoever. All actions are transformational in nature and they arise only within the domain of the apparition.

Now this kind of causation that we are talking about now, this "apparitional causation" is called, in Sanskrit, *Vivarta*. That means you mistook one thing for another. Nothing happened to it. Nothing has happened. You are still perfectly good. Nothing has happened. The other kind of causation which we have been talking about, "transformational causation" is called, in Sanskrit, *Parinama*.

The Sankhyans were *Parinama-vadins*. They believed in transformational causation. The Advaita Vedantins, on the other hand, are *Vivarta-vadins*. They believe that the first cause is apparitional. After that you can do whatever you like. (Laughter) But the first cause is apparitional. Nothing has happened. Nothing whatsoever. That is why Advaita Vedanta has this notion of *Anatavada*, complete non-birth. No birth has happened. Nothing has happened. Now you see the problem.

Since we are genetically programmed the problem is to countercheat the genes. The genes have us programmed to run after the Undivided in a way which will never bear fruit. It bears offspring, but it will never get you to the Undivided. The genes have us programmed to run toward these three goals through transformational causation and the whole thing is just as frustrating as trying to pick yourself up by your own bootstraps. You'll never get it done you see. The whole Universe is like that. We are programmed to run in the wrong directions. You see, even the hydrogen can't get it and it's not even mis-programmed. Through time and space it is just not possible, by transformational causation, to reach that which is beyond space and time.

So our problem is to countercheat the genes. Essentially there are two ways. Either re-direct the genes or tell them to go to blazes. Just don't cooperate. Just tell them to go to and simply discriminate between the real and the transient. You may remember that the Vedantins say that there are four things that you have to have if you are going to succeed: 1) "Nityanitya vastu viveka", discrimination between the real and the transient. 2) "Ihamutra

phalabhogaviraga", renunciation of the enjoyment of the fruits of action. Then there are the six treasures and, finally, "Mumukshutvam", or the yearning for freedom.

"Ihamutra phalabhogaviraga", is the renunciation of the fruits of action. You see what that means? Don't get caught in transformational causation! "Fruits of action" means you did something by transformational causation and you want something back. You wait for the mailman. (Laughter) You wrote a letter and now you wait for the mailman. Don't wait for the mailman! If you don't expect anything, you're out. It is nice and simple. We sit around here waiting for mailmen. Okay? That is what the game is. You do something and wait for the fruits. So "Ihamutra phalabhogaviraga" means don't wait for any fruits. That is what keeps you here. We have got the wool pulled over our own eyes and we hang on to it tightly. Someone would have to cut off our hands to get the wool off of our eyes since we hang on to it so tightly.

So there are four things. First is discrimination between the real and the unreal. We got into it by an indiscrimination; we get out by discrimination, not by action. Second, we have to give up the notion that we are going to get out by action. You see we have mistaken the rope for a snake and then become snake fanciers. First discriminate between the rope and the snake. Second is to cease being snake fanciers. Then the next problem is the mind. It is going to be done by the mind. It is not going to be done by somebody else, like your hands or your feet. So you have to have the mind in good shape. Therefore the third is these "six treasures". You have got to be able to control your senses and keep them under control; you have got to be able to put up with heat and cold and the faults of others – all these things – and you have to have *Shraddha*, this tremendous enthusiasm that you are going to get the job done. It is translated as faith, but faith is not a very good translation of Shraddha. It means a tremendous spiritual enthusiasm that you are going to get the job done now. Fourth, and finally, you have to have *Mumukshutvam*. That is to say, yearning for liberation.

Now if you look carefully you will find that these four things are your four Yogas. Jnana Yoga is the discrimination between the real and the unreal. Karma Yoga is doing your actions in such a way that you don't wait for the mailman. Raja Yoga is control of the mind – that's your instrument, that's the boat in which you are going to cross the sea; keep it caulked. And Mumukshutvam, yearning for the reality, that's Bhakti Yoga.

You see it doesn't matter how you look at this, they are always saying the same thing. Whether they speak of these four things that you have to do as part of Jnana Yoga, or whether they speak of the four Yogas, you see that all the four Yogas are there. It doesn't matter, you see, what way you look at it, we got into this by indiscrimination; we'll get out by discrimination.

Now in Bhakti Yoga what we do is countercheat the genes. If you like to pick flowers, you don't pick them for corsages. You offer them in worship. If you like to cook, you offer it in worship. All of the things that you do, you offer in worship. You see, that is countercheating the genes. Worship, rightly done, is simply a countercheating device for channeling your actions toward discrimination. The actions which you do in the worship couldn't possibly bear fruit.

The genes have us persuaded to run after things through transformational causation. Your trick is to countercheat back and do those same actions that are dictated by the genes in such a way that they do not get the genetic job done but contribute, instead, toward your discrimination.

Well, what else more is there to say? If we had gotten into this by transformation we could get out by transformation. But we got in by apparition and we will get out by undoing the apparition. This notion of the Gunas, you see, arises here. It would never have arisen in transformational causation. So if by any chance you think, or sometimes read, that the Sankhyans invented the notion of the Gunas – no. They not only did not invent the notion of the Gunas, they never had a handle on it. It is the Advaita Vedantins that have it.

Now I myself am very fond of cartography. I myself feel that if I am told how I got into this, I will know what to do about it. I like to know how I got where I am.

Once there was a lady in a store and she asked the clerk if he could please help her out. And he said, "Certainly, madam, how did you get in?" (Laughter) If you tell me how you got in, I'll tell you how to get out. We have to understand, you see, that through transformational causation we did not get in, and we don't get out. Now not only is there no action by which you could get out, but there is also no action which you could get in.

Once place in the Upanishads it says about a man of realization, "Such thoughts certainly do not distress him, why I did not do the right, why I did what is sinful." In another place it says, "If the killer thinks that he is killing, or the killed that he is killed, neither of them knows. That neither kills nor is killed."

The Reality behind this is completely beyond space and time. Our whole notion of seeing a Universe within space and time is simply a mistake.

[Dehabhisane galite vijnate paramatmani Yatra, yatra manoyati, tatra, tatra sanadhaya – "When body consciousness has melted away, and the Supreme Self has been realized; Where, where the mind is sent - There, there it gets Samadhi."]