

PERSONAL and IMPERSONAL

Footnote to Physics and Vedanta

As monatomic hydrogen, Mother pervades the entire Universe through the far reaches of the inter-galactic spaces of the Great Elsewhere. And the Changeless shows as hydrogen's inertia so it can coast. The Infinite shows as its electricity so that it can shine. And the Undivided shows as gravity so it can fall together to galaxies and stars. All the other elements are made by the gravity of stars. And if the underlying existence is thus seen in time and space, it may *automatically* be seen as hydrogen. So there is this question: Can it be seen as personal?

There has long been this question among the Advaita Vedantins: Can the Underlying Existence, the Changeless, the Infinite, the Undivided show through in time and space as personal? The problem has caused a lot of trouble. Some say that the Underlying Existence could *not* be both personal and impersonal. Others say, "Why not?"

So let's be careful! The Underlying Existence, since it's not in time and space, *must* be Changeless, Infinite, and Undivided, because change takes place in time, and smallness and dividedness are seen in space. Now finite, from the Latin, means fenced and *infinite means unfenced*. So if you say that the Underlying Existence could *not* be personal, you have fenced it. You have fenced the unfencable, and you are defending an indefensible position.

Also let's look at the observational evidence. Swami Vivekananda, long after he had experienced *Nirvikalpa Samadhi*, visited a vandalized temple, and as he was thinking, "Had I been here..." he heard Mother's voice. "Do you protect me or do I protect you?" And Sri Ramakrishna, after spending half a year in *Nirvikalpa Samadhi*, still referred to God as Mother.

And I'm reminded of a remark by Swami Shantaswarupananda, "You can't exaggerate about a divine incarnation."

To say that God cannot incarnate as man, is, once again, to fence the unfencable.

John L. Dobson
Hollywood 2002

PHOTONS?

"We shape the clay into a pot, but it is the emptiness inside that holds whatever we want." – Lao Tsu

But what is space?

"Not there the sun shines, nor moon nor star..."

But what is light?

From ancient time these questions have come down to us. How many minds have wondered about the nature of space and light? How many songs? How many hymns? In the 1700's Euler, the great mathematician wrote to a German princess, "This is, beyond question, one of the most important inquiries in Physics."

In the 1600's, with the help of a prism, Newton had separated sunlight into its constituent colors which he thought of as its "least parts". He thought of light as corpuscular. "Are not the rays of light very small bodies emitted from shining substances?" He thought that the colors were made by corpuscles of different sizes. The corpuscles were thought to travel as the planets travel, according to Newton's laws of motion. Left alone they traveled in straight lines.

For many years Newton's view swept the field.

But why don't corpuscles collide?

Gradually at the hands of Huygens, Young, and Fresnel, Euler's notion that light might be a vibration like sound began to gain ground. But if light, like sound, was a wave motion, it required a medium for its transmission. Space could no longer be empty. Space must be filled with a material substance which came to be called the "luminiferous ether".

But how could the "luminiferous ether" be sufficiently rigid to transmit the vibrations at the speed of light and yet let the planets pass through it?

Then came Faraday with the discovery of electromagnetic induction. There were "lines of force" through space. There were electric and magnetic fields. Space was filled with fields, and the fields were filled with energy. There were gravitational fields and electromagnetic fields. Maxwell suggested that light was an electromagnetic wave through space, through the "luminiferous ether".

Then came Michelson and Morley. But no one could find the ether. Then came Planck and Einstein. Light, whether a wave or a particle, was quantized. The energy of the quanta was Planck's constant times the frequency ($E=h\nu$). As

Newton had suggested long ago, the color is related to the size (in this case, the energy) of the quanta. G. N. Lewis, who used the term "jiffy" for the length of time it takes light to cross a centimeter, called the quanta "photons". But the speed of the photons, with respect to the observer, is independent of the observer's motion through space. So Einstein thought that we could keep the photons, but who needs the "luminiferous ether"? The photons, like fish out of water, were without the sea of "luminiferous ether" in which to swim. But wait! Einstein put time into our geometry with space (where it belongs) so what does that do to our space? What we say now is that, "Matter tells space-time how to bend and space-time tells matter how to move" [Ref: Wheeler]. As Swami Vivekananda (a Vedantist monk and lecturer who visited the U. S. twice around the turn of the century) suggested to Tesla in the winter of 1895-96, that what we see as matter is just potential energy ($E=mc^2$). Matter is wound up against space-time and space-time is wound up against matter.

But what happens to our light?

In the four-dimensional geometry of space-time we see things at a distance by seeing them in the past. The separation between the emission events and absorption events of the photons goes to zero, and even the fish are now gone. We are left with a Universe which looks more like a dream. The separation between the Perceiver and the Perceived goes to zero because space and time come into Einstein's equation as a pair of opposites ($S^2=c^2t^2-x^2$, where x and t are the space-time separations between the two events, and S is the total space-time separation between those two events.) What we see as a light-year away, we see as a year ago, because time comes in squared with a minus sign.

But what are the fields and what are the forces? What is the gravitational attraction? What is electricity? What is inertia? And what could exist in the absence of space and time?

Whatever exists in the absence of time must be the Changeless, since change takes place only in time. And whatever exists in the absence of space must be Infinite and Undivided, since smallness and dividedness can only exist in space. But how does "It" show in space and time? Is gravity the Undivided? And is love? Is electricity the Infinite? And is our yearning for freedom? Is Inertia the Changeless? And is our yearning for peace? Are gravity, electricity, and inertia simply the Underlying Existence as we see it in space and time?

Light has been reduced to the emission and absorption events and even the photons are gone. Space and time have been reduced to a pair of opposites with zero separation between the Perceiver and the Perceived. So the dream is in the Dreamer, but the dream is alive, because the Underlying Existence shows through us in what we see.

PHYSICS AND VEDANTA

"All this is Brahman. Let a man meditate on that visible world as beginning, ending, and breathing in it, the Brahman." -Chandogya Upanishad

"The constitution of the Universe may be put in first place among all natural things that can be known." -Galileo

That, of course, is the task of the physicist, to see if he can figure out the constitution of the Universe. And I went to the University of California in 1934 to study bio-chemistry in the hope of keeping Einstein alive, so that *he* could figure it out. But I now believe that it is impossible to figure it out without the help of the Vedantins.

What we now call the *philosophy* of Vedanta (and I don't mean the *practice*, but the philosophy *behind* the practice of what we call Advaita Vedanta) was apparently invented by some very sharp physicists in India a long time ago, because a great deal of that old physics, including the identity of mass and energy (which, in modern times, went from Swami Vivekananda through Tesla to Mileva Einstein) is built into the Sanskrit language, and the language is very old. And those old physicists discovered some very interesting and important physics which we desperately need now if we're going to figure this thing out.

The Sanskrit word for this Universe is *Jagat*, the changing. But those old physicists were smart enough to see that, since change is seen against the changeless, there must be, *underlying this changing Universe*, an existence *not in time and space*, and therefore, neither changing, finite, nor divided. That existence they called *Brahman*. The problem then arose, "How, then, do we see change? If what exists is Changeless, how do we see a Universe of change?" And they said, "It can only be by mistake." So they studied mistakes. If they hadn't studied mistakes, they might not have seen it. Through their careful analysis of mistakes they made some *essential* contributions to our understanding of the Universe.

They pointed out that in order to mistake a rope for a snake, there are *three* things that one must do. First, one must fail to see that it's a rope. (That they called the veiling power of the mistake, *Avarana Shakti*.) Next, one must jump to the conclusion that it's a snake. (That they called the projecting power of the mistake, *Vikshepa Shakti*.) And finally, one must have seen the length and diameter of the rope *in the first place* or one never would have mistaken it for the length and diameter of a snake. (That they called the revealing power of the mistake, *Prakasha Shakti*.) And *that* is what is so very important to our physics. It is because of the *revealing power*, that the Changeless, the Infinite, the Undivided *must* show through in the physics.

Those old physicists sometimes referred to these three aspects of a misperception as red, white, and black. Black refers to the darkness of evening twilight; white, to the partial light of twilight (i.e. if you hadn't seen the rope, you never would have mistaken it for a snake), and red, to the fact that the perception was colored by imagination. They also referred to these three aspects as the three *Gunas* (*Tamas*, *Rajas*, and *Sattva*).

The mistake of seeing the underlying existence in time and space they called *Maya* or *Prakriti*, the first cause, and it is said to be *made* of these three *Gunas*. *Tamas* is said to have the veiling power. *Rajas* is said to have the projecting power. And *Sattva* is said to have the revealing power. The veiling and projecting powers are presumably native to the genetic programming, but the revealing power, which is important to our physics, is native to sentience itself.

To quote the *Panchamahabhuta Sutras*, "As if, being hidden, through the veiling power of *Tamas*, the nature of *Brahman*, through the revealing power of *Sattva*, shone in the otherness for which, through the projecting power of *Rajas*, it is, as it were, mistaken." What we see as energy is the result of this mistake, because the *Underlying Existence* (*the Changeless, the Infinite, and the Undivided*) *must show through in what we see*.

The concept of energy did not arise in European physics until 1845 with Thomas Young, but those older physicists saw that the whole Universe is *made out of energy* which they called *Shakti*. According to them, energy is that Underlying Existence, which they called *Brahman*, as seen in time and space. And they could see that the underlying existence *has* to be Changeless, *has* to be Infinite, *has* to be Undivided, and that it *has to show through in our physics*.

According to the Vedantins, the *first cause* of our physics is *Vivarta*, **apparition**. It is the *mistake* of seeing the Underlying Existence as in time and space. After that, things proceed by *Parinama*, transformational causation, because the Underlying Existence shows through in the mistake as energy, as gravity, electricity, and inertia, which cause the transformations. *Parinama* is what we European physicists usually think of as causation. It is governed by the Conservation laws. The form of the energy may change but the amount of energy, in any such change, does *not* change, it remains constant.

The electrical energy of an electrical particle will go to zero if, and only if, the size of that particle goes to infinity. The gravitational energy of the Universe will go to zero if, and only if, the dividedness of the Universe goes to zero. (Infinity and undividedness are written into our physics. And changelessness is written in as inertia.)

Had those old physicists known what we know now, that the Universe is made of hydrogen and that the hydrogen is made of electrons and protons, they would have seen that the Changeless shows through in the hydrogen as its inertia; the Infinite, as its electricity; and the Undivided, as its gravity and the attraction between opposites. Richard Feynman has pointed out that although we

(in Europe) know *how* things fall, we have no knowledge of *why* they fall, and that although we know *how* things coast, we have no knowledge of *why* they coast. Einstein made a similar remark about electricity, namely, that we cannot comprehend, on theoretical grounds, why matter should appear as discrete electrical particles. But those older physicists knew *why*.

Only the primordial hydrogen arises by *Vivarta* from the Changeless, the Infinite, the Undivided showing through in time and space. Everything else that we see arises *from* that hydrogen by *Parinama*. And the details are in Burbidge, Burbidge, Fowler, and Hoyle, "Synthesis of the Elements in Stars." We know now that the hydrogen falls together by *transformational* causation to galaxies and stars, planets, and people. Even the bodies of living organisms arise by transformational causation, but the notion that one *is such a body* is, again, a *Vivarta*, a personal mistake.

The practices of the Advaita Vedantins take all this old physics for granted. It is even taken for granted that there is but one reality behind both the individual and the Universe, *Ayam Atma Brahma*, this *Atman is Brahman*. (*Atman* is the reality behind the ego, and *Brahman* is the reality behind the Universe.) And it is taken for granted that if seeing it thus is a mistake, it must be possible to see through it; that it must be possible to see through the ego to the *Atman*, and through the Universe to *Brahman*.

Now those old Vedantins were not content simply to understand all this in their intellects. When they discovered that there *must* be an existence underlying the world which we see, their question was, "Can we reach it?" That was the effort that swept India in those days, and may yet sweep Europe and America. And that is why we have the Upanishads with all those stirring declarations:

"Not there the Sun shines, nor moon nor star. There the lightning does not flash, how could this fire? That shining, after-shines all this. By its light all this is lit."

"That which is beyond this world is without form and without suffering. Those who know it become immortal."

"I know that great Purusha of sun-like luster beyond the darkness. A man who knows Him truly passes over death. There is no other path to go."

"Only when men shall roll up the sky like a hide will there be an end of misery unless That has first been known."

"The infinite alone is happiness. There is no happiness in the small."

Still, for us, there is a question. *Why is that underlying existence seen as hydrogen?* Perhaps those older physicists would have pointed out that in order to

see, *in space and time*, that which is *not* in space and time there is a problem. If the one were to be seen as two, the oneness will show through and close the "twoness" down. [In other words] the undividedness showing through would bring the two together. What could stop it? Similarly, if the one were to be seen as many, the oneness will show through and close the "manyness" down. [In other words] the undividedness, showing through, would bring the manyness together. But if the one is seen as both two and many, as a duality *within* a plurality (as we see it in hydrogen), then the plurality could keep the duality up, and the duality could keep the plurality up, because neither can be seen alone.

What we see in the hydrogen is an electrical duality (the electrons and the protons of the hydrogen atoms) against a gravitational plurality (the dispersion of the atoms through space). And the oneness (undividedness) shows through as gravity (in the plurality) and as the attraction between plus and minus, and between spin-up and spin-down, (in the duality). But the collapse of the electrical duality in the hydrogen atom is prevented by the gravitational dissimilarity of the electron and proton. That's Heisenberg's Uncertainty Principle, because the proton is involved in the gravitational plurality and the electron is not. And the collapse of the gravitational plurality is prevented by the spin duality of the neutrons. That's Pauli's Exclusion Principle, because the neutrons have only one half of a spin duality.

Heisenberg's Uncertainty Principle does *not* prevent the collapse of the duality of the electron and the *positron* (an electron with a positive charge) because gravity is not involved in the rest energy of either particle. But it *does* prevent the collapse of the electrical duality in the hydrogen atom because the rest energy of the *proton* is related to its *gravitational* separation from all the rest of the matter in the observable Universe. As Richard Feynman has pointed out, "The electron is purely electrical; the proton is not."

And Pauli's Exclusion Principle does not prevent Bose particles (without the spin duality) from sitting together.

The spiritual practices of the Advaita Vedantins follow the cosmology of those old physicists. If we have mistaken the real for the make believe, there are four things to do about it. First, discriminate between the real and the make believe. That's *Jnana Yoga*, the path of knowledge. Next, hang onto the real. That's *Bhakti Yoga*, the path of devotion. Fall in love with the Underlying Existence. Next, give up the make believe. Give up the attachment to the fruits of your actions. Give up the *expectation* that through transformational causation you'll reach the Underlying Existence which is beyond form and change. That's *Karma Yoga*, the path of action. And, finally, keep your body and mind in such fantastic shape that you can get the job done. That's called *Raja Yoga*, the royal path.

Sri Ramakrishna saw the underlying existence, manifest in time and space, as Mother, and said that *we* are not the doers. *Mother* is the doer. And Lao Tzu said, "To Her only I bow, trusting Her now and forever."

If it were *impossible* to see through this mistake to the underlying existence, we would *not* have the Upanishads and the lives of saints.

Mother is the hydrogen. Mother is the star.
She falls it all together to make us what we are.

She makes the heavy elements and throws them all around,
To make the rocky planets with soil on the ground.

She scatters the ingredients across the planet Earth,
Assembling them with sunlight to give us all our birth.

She shines the sun on all these plants; the oxygen is waste.
We munch the plants, and huff and puff, and run around in haste.

But we, poor dears, so mean of heart, assume we're in the know,
And thinking we can manage, fail to see Who runs the show.

If, in time and space, the Changeless didn't show through, we wouldn't have inertia. If the Infinite didn't show through, we wouldn't have electricity. And if the Undivided didn't show through, we wouldn't have gravity and the attraction between opposites. Also, if the duality didn't keep up the plurality, we wouldn't have the atomic table. And if the plurality didn't keep up the duality, we wouldn't have atoms at all. That's how I see it.

"Space is not that which separates the many, but that which seems to separate the one. And in that space that oneness shines, *therefore* falls whatever falls."

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PHYSICS AND VEDANTA

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What we now call Vedanta philosophy was apparently invented by some very sharp physicists in India a long time ago, because a great deal of that old physics is built into the Sanskrit language, and the language is very old. And those old physicists knew some very interesting and important physics which we had not discovered in Europe. Some of it we have yet to discover.

The Sanskrit word for this Universe is Jagat, the changing. But those old physicists saw that since change is seen against the changeless, there must be, *underlying this changing Universe*, an existence *not in time and space*, and therefore, neither changing, finite nor divided. The problem then arose, "How, then, do we see change? If what exists is changeless, how do we see a Universe of change?" And they said, "It can only be by mistake." So they studied mistakes, and they made an important contribution to our understanding of this Universe. They pointed out that in order to mistake a rope for a snake, there are three things that one must do. First, one must fail to see that it's a rope. Next, one must jump to the conclusion that it's a snake. And finally, one must have seen the length and diameter of the rope in the first place or one never would have mistaken it for a snake. Those old physicists sometimes referred to these three aspects of a misperception as red, white and black. Black refers to the darkness of dusk, white, to the partial light of twilight, and red, to the fact that the perception was colored by imagination. They also referred to them as the three Gunas (Tamas, Rajas and Sattva). The mistake of seeing things in space and time they called Maya or Prakriti, the first cause, and it is said to be *made* of these three Gunas. Tamas is said to have its veiling power Avarana Shakti. Rajas is said to have its projecting power, Vikshepa Shakti. And Sattva is said to have its revealing power, Prakasha Shakti.

Without the help of those old physicists I see no hope of understanding why we see a Universe of hydrogen falling together by gravity to galaxies and stars. According to them the underlying existence has to be changeless, it has to be infinite, it has to be undivided, and it *has* to show through. It's the underlying existence showing through in the revealing power as energy that drives whatever is driven in this changing world. If we see the changeless as changing, the changeless must show in the changing. If we see the infinite as finite, the infinite must show in the finite. And if we see the undivided as divided, the undivided must show in the divided. That's what drives whatever is driven. Had those old physicists known that the Universe is made of hydrogen, they would have seen that the changeless shows through in the hydrogen as its inertia, the infinite, as its electricity, and the undivided, as its gravity and the attraction between opposites. We European physicists have no explanation for any of this, not for gravity, nor electricity, nor inertia.

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Now those old physicists were not content simply to understand all this in their intellects. When they discovered that there *must* be an existence underlying the world which we see, their question was, "Can we reach it?" That was the effort that swept India in those days, and may yet sweep us. And that is why we have the Upanishads with all those stirring declarations.

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Still, for us, there is a question. Why do we see hydrogen and not something else? Perhaps those old physicists would have pointed out that in order to see, *in space and time*, that which is *not* in space and time there is a problem. If the one is seen as two, the oneness will show through and close the twoness down. Similarly, if the one is seen as many, the oneness will show through and close the manyness down. But if the one is seen as both two and many, as a duality within a plurality, then the plurality could keep the duality up, and the duality could keep the plurality up because neither could be seen alone.

What we see in the hydrogen is an electrical duality against a gravitational plurality. And the oneness shows through in the duality as the electrical attraction between the electron and the proton. It shows through in the plurality as gravity. And the demise of the electrical duality is prevented by the gravitational dissimilarity of the electron and the proton. That's Heisenberg's uncertainty principle. And the demise of the gravitational plurality is prevented by the spin duality of the neutrons. That's Pauli's exclusion principle.

Finally, our problem is: How to reach the underlying existence. Essentially there are four ways. First, discriminate between the real and the make believe. That's Jnana Yoga, the path of knowledge. Next, hang onto the real. That's Bhakti Yoga, the path of devotion. Next, give up the make believe. Give up the *expectation* that through transformational causation you'll reach the underlying existence which is beyond form and change. That's Karma Yoga, the path of action. And finally, keep your body and mind in such fantastic shape that you can get the job done. That's called Raja Yoga, the royal path.

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The concept of energy did not arise in European physics until 1845 with Thomas Young, but those older physicists saw that the whole Universe is *made out of energy* which they called *Shakti*. According to them, *energy is that Underlying Existence*, which they called *Brahman*, as seen in time and space. And they could see that the underlying existence *has to be Changeless, has to be Infinite, has to be Undivided*, and that it *has to show through in our physics*.

According to the Vedantins, the *first cause* of our physics is *Vivarta, apparition*. It is the *mistake* of seeing the Underlying Existence as in time and space. After that, things proceed by *Parinama*, transformational causation, because the Underlying Existence shows through in the mistake as energy, as gravity, electricity, and inertia, which cause the transformations. *Parinama* is what we European physicists usually think of as causation. It is governed by the Conservation laws. The form of the energy may change but the amount of energy, in any such change, does *not* change, it remains constant.

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Had those old physicists known what we know now, that the Universe is made of hydrogen and that the hydrogen is made of electrons and protons, they would have seen that the Changeless shows through in the hydrogen as its inertia; the Infinite, as its electricity; and the Undivided, as its gravity and the attraction between opposites. Richard Feynman has pointed out that although we

(in Europe) know *how* things fall, we have no knowledge of *why* they fall, and that although we know *how* things coast, we have no knowledge of *why* they coast. Einstein made a similar remark about electricity, namely, that we cannot comprehend, on theoretical grounds, why matter should appear as discrete electrical particles. But those older physicists knew *why*.

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The practices of the Advaita Vedantins take all this old physics for granted. It is even taken for granted that there is but one reality behind both the individual and the Universe, *Ayam Atma Brahma*, this *Atman is Brahman*. (*Atman* is the reality behind the ego, and *Brahman* is the reality behind the Universe.) And it is taken for granted that if seeing it thus is a mistake, it must be possible to see through it; that it must be possible to see through the ego to the *Atman*, and through the Universe to *Brahman*.

Now those old Vedantins were not content simply to understand all this in their intellects. When they discovered that there *must* be an existence underlying the world which we see, their question was, "Can we reach it?" That was the effort that swept India in those days, and may yet sweep Europe and America. And that is why we have the Upanishads with all those stirring declarations:

"Not there the Sun shines, nor moon nor star. There the lightning does not flash, how could this fire? That shining, after-shines all this. By its light all this is lit."

"That which is beyond this world is without form and without suffering. Those who know it become immortal."

"I know that great Purusha of sun-like luster beyond the darkness. A man who knows Him truly passes over death. There is no other path to go."

"Only when men shall roll up the sky like a hide will there be an end of misery unless That has first been known."

"The infinite alone is happiness. There is no happiness in the small."

Still, for us, there is a question. *Why is that underlying existence seen as hydrogen?* Perhaps those older physicists would have pointed out that in order to

see, *in space and time*, that which is *not* in space and time there is a problem. If the one were to be seen as two, the oneness will show through and close the “twoness” down. [In other words] the undividedness showing through would bring the two together. What could stop it? Similarly, if the one were to be seen as many, the oneness will show through and close the “manyness” down. [In other words] the undividedness, showing through, would bring the manyness together. But if the one is seen as both two and many, as a duality *within* a plurality (as we see it in hydrogen), then the plurality could keep the duality up, and the duality could keep the plurality up, because neither can be seen alone.

What we see in the hydrogen is an electrical duality (the electrons and the protons of the hydrogen atoms) against a gravitational plurality (the dispersion of the atoms through space). And the oneness (undividedness) shows through as gravity (in the plurality) and as the attraction between plus and minus, and between spin-up and spin-down, (in the duality). But the collapse of the electrical duality in the hydrogen atom is prevented by the gravitational dissimilarity of the electron and proton. That’s Heisenberg’s Uncertainty Principle, because the proton is involved in the gravitational plurality and the electron is not. And the collapse of the gravitational plurality is prevented by the spin duality of the neutrons. That’s Pauli’s Exclusion Principle, because the neutrons have only one half of a spin duality.

Heisenberg’s Uncertainty Principle does *not* prevent the collapse of the duality of the electron and the *positron* (an electron with a positive charge) because gravity is not involved in the rest energy of either particle. But it *does* prevent the collapse of the electrical duality in the hydrogen atom because the rest energy of the *proton* is related to its *gravitational* separation from all the rest of the matter in the observable Universe. As Richard Feynman has pointed out, “The electron is purely electrical; the proton is not.”

And Pauli’s Exclusion Principle does not prevent Bose particles (without the spin duality) from sitting together.

The spiritual practices of the Advaita Vedantins follow the cosmology of those old physicists. If we have mistaken the real for the make believe, there are four things to do about it. First, discriminate between the real and the make believe. That’s *Jnana Yoga*, the path of knowledge. Next, hang onto the real. That’s *Bhakti Yoga*, the path of devotion. Fall in love with the Underlying Existence. Next, give up the make believe. Give up the attachment to the fruits of your actions. Give up the *expectation* that through transformational causation you’ll reach the Underlying Existence which is beyond form and change. That’s *Karma Yoga*, the path of action. And, finally, keep your body and mind in such fantastic shape that you can get the job done. That’s called *Raja Yoga*, the royal path.

Sri Ramakrishna saw the underlying existence, manifest in time and space, as Mother, and said that *we* are not the doers. *Mother* is the doer. And Lao Tzu said, “To Her only I bow, trusting Her now and forever.”

If it were *impossible* to see through this mistake to the underlying existence, we would *not* have the Upanishads and the lives of saints.

Mother is the hydrogen. Mother is the star.
She falls it all together to make us what we are.

She makes the heavy elements and throws them all around,
To make the rocky planets with soil on the ground.

She scatters the ingredients across the planet Earth,
Assembling them with sunlight to give us all our birth.

She shines the sun on all these plants; the oxygen is waste.
We munch the plants, and huff and puff, and run around in haste.

But we, poor dears, so mean of heart, assume we're in the know,
And thinking we can manage, fail to see Who runs the show.

If, in time and space, the Changeless didn't show through, we wouldn't have inertia. If the Infinite didn't show through, we wouldn't have electricity. And if the Undivided didn't show through, we wouldn't have gravity and the attraction between opposites. Also, if the duality didn't keep up the plurality, we wouldn't have the atomic table. And if the plurality didn't keep up the duality, we wouldn't have atoms at all. That's how I see it.

"Space is not that which separates the many, but that which seems to separate the one. And in that space that oneness shines, *therefore* falls whatever falls."

John L. Dobson Sidewalk Astronomers (Founder)
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Physics & Vedanta - Addendum 1

Deleted: PHYSICS AND VEDANTA¶

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"All this is Brahman. Let a man meditate on that visible world as beginning, ending and breathing in it, the Brahman."¶

Chandogya Upanishad¶

¶
What we now call Vedanta was apparently invented by some very sharp physicists in India a long time ago, because a great deal of that old physics is built into the Sanskrit language, and the language is very old. And those old physicists knew some very interesting and important physics which we had not discovered in Europe. Some of it we have yet to discover.¶

The Sanskrit word for this Universe is Jagat, the changing. But those old physicists saw that since change is seen against the changeless, there must be, *underlying this changing Universe, an existence not in time and space*, and therefore, neither changing, finite nor divided. The problem then arose, "How, then, do we see change? If what exists is changeless, how do we see change?" And they said, "It can only be by mistake." So they studied mistakes, and made an important contribution to our understanding of this Universe. They pointed out that in order to mistake a rope for a snake, there are three things that one must do. First, one must fail to see that it's a rope. Next, one must jump to the conclusion that it's a snake. And finally, one must have seen the length and diameter of the rope in the first place or one never would have mistaken it for a snake. Those old physicists sometimes referred to these three aspects of a misperception as red, white and black. Black refers to the darkness of dusk, white, to the partial light of twilight, and red, to the fact that the perception was colored by imagination. They also referred to them as the three Gunas (Tamas, Rajas and Sattva). The mistake of seeing things in space and time they called Maya or Prakriti, the first cause, and it is said to be *made* of these three Gunas. Tamas is said to have its veiling power Avarana Shakti. Rajas is said to have its projecting power, Vikshepa Shakti. And Sattva is said to have its revealing power, Prakasha Shakti.¶

Now the interesting thing about their analysis of mistakes is the play of the revealing power in what we see in space and time. underlying existence has to be changeless, it has to ... [1]

PHYSICS AND VEDANTA

"All this is Brahman. Let a man meditate on that visible world as beginning, ending and breathing in it, the Brahman."

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Now the interesting thing about their analysis of mistakes is the play of the revealing power in what we see in space and time. *underlying existence* has to be changeless, it has to be infinite, it has to be undivided, and it *has* to show through. It's the *underlying existence* showing through in the revealing power as energy that drives whatever is driven in this changing world. If we see the changeless as changing, the changeless must show in the changing. If we see the infinite as finite, the infinite must show in the finite. And if we see the undivided as divided, the undivided must show in the divided. That's what drives whatever is driven. Had those old physicists known that the Universe is made of hydrogen falling together by gravity to galaxies and stars, they would have seen that the changeless shows through in the hydrogen as its inertia, the infinite, as its electricity, and the undivided, as its gravity and the attraction between opposites. We European physicists have no explanation for any of this, not for gravity, nor electricity, nor inertia.

Now those old physicists were not content simply to understand all this in their intellects. When they discovered that there *must* be an existence underlying the world which we see, their question was, "Can we reach it?" That was the effort that swept India in those days, and may yet sweep us. And that is why we have the Upanishads with all those stirring declarations.

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"Only when men shall roll up the sky like a hide will there be an end of misery unless That has first been known."

"The infinite alone is happiness. There is no happiness in the small."

Still, for us, there is a question. Why do we see hydrogen and not something else? Perhaps those old physicists would have pointed out that in order to see, in space and time, that which is not in space and time there is a problem. If the one is seen as two, the oneness will show through and close the twoness down. Similarly, if the one is seen as many, the oneness will show through and close the manyness down. But if the one is seen as both two and many, as a duality within a plurality, then the plurality could keep the duality up, and the duality could keep the plurality up because neither could be seen alone.

What we see in the hydrogen is an electrical duality against a gravitational plurality. And the oneness shows through in the duality as the electrical attraction between the electron and the proton. It shows through in the plurality as gravity. And the demise of the electrical duality is prevented by the gravitational dissimilarity of the electron and the proton. That's Heisenberg's uncertainty principle. And the demise of the gravitational plurality is prevented by the spin duality of the neutrons. That's Pauli's exclusion principle.

Finally, our problem is: How to reach the underlying existence. Essentially there are four ways. First, discriminate between the real and the make believe. That's Jnana Yoga, the path of knowledge. Next, hang onto the real. That's Bhakti Yoga, the path of devotion. Next, give up the make believe. Give up the expectation that through transformational causation you'll reach the underlying existence which is beyond form and change. That's Karma Yoga, the path of action. And finally, keep your body and mind in such fantastic shape that you can get the job done. That's called Raja Yoga, the royal path.

If it were impossible to see through this mistake to the underlying existence, we would not have the Upanishads and the lives of saints.

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PHYSICS AND VEDANTA – Addendum 2

“All this is Brahman. Let a man meditate on that visible world as beginning, ending and breathing in it, the Brahman.”

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What we now call Vedanta philosophy was apparently invented by some very sharp physicists in India a long time ago, because a great deal of that old physics is built into the Sanskrit language, and the language is very old. And those old physicists knew some very interesting and important physics which we had not discovered in Europe. Some of it we have yet to discover.

The Sanskrit word for this Universe is Jagat, the changing. But those old physicists saw that since change is seen against the changeless, there must be, *underlying this changing Universe*, an existence *not in time and space*, and therefore, neither changing, finite nor divided. The problem then arose, “How, then, do we see change? If what exists is changeless, how do we see a Universe of change?” And they said, “It can only be by mistake.” So they studied mistakes, and they made an important contribution to our understanding of this Universe. They pointed out that in order to mistake a rope for a snake, there are three things that one must do. First, one must fail to see that it's a rope. Next, one must jump to the conclusion that it's a snake. And finally, one must have seen the length and diameter of the rope in the first place or one never would have mistaken it for a snake. Those old physicists sometimes referred to these three aspects of a misperception as red, white and black. Black refers to the darkness of dusk, white, to the partial light of twilight, and red, to the fact that the perception was colored by imagination. They also referred to them as the three Gunas (Tamas, Rajas and Sattva). The mistake of seeing things in space and time they called Maya or Prakriti, the first cause, and it is said to be *made* of these three Gunas. Tamas is said to have its veiling power Avarana Shakti. Rajas is said to have its projecting power, Vikshepa Shakti. And Sattva is said to have its revealing power, Prakasha Shakti.

Without the help of those old physicists I see no hope of understanding why we see a Universe of hydrogen falling together by gravity to galaxies and stars. According to them the underlying existence has to be changeless, it has to be infinite, it has to be undivided, and it *has* to show through. It's the underlying existence showing through in the revealing power as energy that drives whatever is driven in this changing world. If we see the changeless as changing, the changeless must show in the changing. If we see the infinite as finite, the infinite must show in the finite. And if we see the undivided as divided, the undivided must show in the divided. That's what drives whatever is driven. Had those old physicists known that the Universe is made of hydrogen, they would have seen that the changeless shows through in the hydrogen as its inertia, the infinite, as its electricity, and the undivided, as its gravity and the attraction between opposites. We European physicists have no explanation for any of this, not for gravity, nor electricity, nor inertia.

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