

ON THE BEACHES OF AFRICA

There was a great deal of talk in the thirties about what was called "the missing link," about what happened between the chimpanzees and ourselves. But by now that has been fairly well worked out by Sir Alister Hardy, Desmond Morris, Elaine Morgan and others. It now seems probable that we were marooned on an island in northeast Africa some ten or fifteen million years ago when the sea level was higher, when the water was warmer, and where we were forced to eat at the beach. *And if we are to understand where we are now, in terms of human behavior, we will have to understand it in the light of that past, in the light of what happened to those primates at the beach. As James Burke says, "If you don't know how you got somewhere, you don't know where you are."*

Here I shall use the word *chimps* to refer to our ancestors at the beach, all the way back to the common ancestors of the chimpanzees and ourselves. Christendom has us descended from Adam and Eve. We are not descended from Adam and Eve. We are descended from those primates at the beach. Hinduism has us descended from some perfected sages who lived in the Satya Yuga (the "Age of Truth"). We are not descended from perfect sages who lacked the courtesy to leave us their bones. *We are descended from those primates at the beach. And if we do not understand that, it is unlikely that we will understand ourselves.*

You have to put *yourself* at that beach and think what would have happened to the genetic programming of a jungle-swinging primate in the surf. When a female chimpanzee is in heat, any male can tell it by sight or smell, and they take turns mating with her. *They don't make love.* They simply copulate and it usually takes about eight seconds. But we were at the beach where the sight and smell signals of the female in heat would be lost in the surf. It was there that we learned to grope and caress and to whisper in each other's ears.

There at the beach we learned to whisper and to talk because sights and smells and body language failed in the surf. And there at that beach we postponed the maturation of the brain and prolonged our childhood to accommodate the change. *It was there on the beaches of Africa that the real change began.*

Put yourself at that beach! What would you have eaten? There would, of course, be seaweed instead of the fruits and leaves of the jungle, but the protein would be mostly packaged in calcium carbonate shells which require to be broken open with a stone. Any chimp could see that. Almost certainly that is what led to our use of stone tools. Louis Leaky found that our early stone tools in Olduvai Gorge were made from "stream-rounded boulders." Why? Because we came from the beach where all the stones were rounded, and where we used

them for procuring food. Even at Olduvai Gorge we lived by the water of streams and lakes. But by then, having come from the sea, we would dung in the drink. Was it cholera and the crocodile that drove us out on land?

Think of yourself as a primate marooned at the beach. Primates are very good at imitation. If one of us learned to swim, we could all learn to swim. And if one of us learned to break shells, we could all learn to break shells. There is evidence now that our shell-breaking habit followed us out onto the savannah where we used it to harvest marrow from the larger bones which even the vultures and hyenas left behind. But only very slowly, in the water, would we have developed breath control and, thereby, the ability to communicate by speech. Probably it was primarily our use of tools and speech that influenced the growth of our brain. And one of the genetic mechanisms for the change was neoteny (the retaining into later life of juvenile characteristics). If you postpone the maturation of the brain, you allow the further development of the frontal lobes, and that is where our speech resides. There is evidence now that the major growth of the brain took place *after* we moved back to the mainland and lived on the savannah. But by then we were talkers and singers with tools and the curiosity of children. Surely it is because neoteny carried the curiosity of infancy into our later years that both science and religion were born at that beach.

Once we were forced to the use of tools and language, tools for breaking shells and language for communication, they became species characteristics and we selected for them in breeding. That would continue the selection for bigger brains. And once we had postponed the maturation of the brain and prolonged our childhood with its insatiable curiosity, we imposed prolonged parenting on our mothers. Motherhood is probably the most outstanding characteristic of our species. Once a mother, always a mother. Women are programmed for human relations, to keep the children and others alive. Children are programmed to cleave to their mothers. But the males, at the beach, would have been programmed for "hit and run."

Because of the long period of gestation, a female primate at the beach couldn't do much better than one child per year even if she were programmed for hit and run. However, that would not be true for the males. Most of the children would have been fathered by the males who were programmed for hit and run. That allowed the females to select. That is how we got so smart. Men were invented by women, women were invented by men. Because of the need for prolonged parental care, the females chose males who showed affection. We are not a pair-bonding species. But prolonged, parental care has turned us a bit in that direction. Women no longer select for hit and run husbands. They choose Romeo over Don Juan.

There is nothing accidental about any of this except in the sense that the whole thing is accidental. Later genetic developments are almost always

superimposed on the previous genetic developments without any mechanism to remove what went before. Romeo's programming is superimposed over Don Juan's.

The changes which we built in at that beach were superimposed on the genetic programming of a jungle-swinging ape who was a clan animal. We are clan animals. It's the Clantons and the Earps. It's the Klingons and the Federation. It's this school against that school, this town against that town, and this country against that. When we're young, it's games; when we're older, it's politics; when we're enlisted, it's war. We're clan animals and it's not likely to go away.

The *primitive* directives of the genetic programming go much further back. We are programmed to keep ourselves alive and to pass on the genetic code. That is, we are programmed to eat, breathe, and mate. But some of the programming comes down from so distant a past that we no longer recognize it for what it is. Our hunger and thirst and our fear of dying are programming to keep us alive. Someone once asked me, "Why does God impose this pain on us?" You can live God out of this. Pain is simply a genetic program to keep us from continuing on the path of self-destruction. If it didn't hurt to cut your fingers off with a hatchet, who knows how many fingers you'd have left. Pain and our fear of death are nothing more than genetic programming. And they have nothing to say about the nature of death.

If we are to understand human behavior we will have to understand it in the light of our beach-combing past. I once attended a three-day conference on Jungianism, and in three days no one mentioned genetic programming. I said to my companion, "They're going to pound the whole board before they find the nail." In my opinion they never did find the nail. *Is it possible to understand the behavior of the human mind without reference to the genetic programming which made us what we are?*

It is important to remember that our programming comes in steps. It's not that we're programmed to go out and have children; rather, the male programming goes something like this: In the absence of females – seek females. In the presence of females – select. In the presence of a selected female start a conversation. Ask her where she is from. Ask her where she's going. Ask her out to dinner. And the rest you know... But the woman has to choose. It is also important to remember that the genetic message is simple: "If it tastes good, eat it. If it feels good, do it." But it was put in before the invention of French pastries. It might be fatal in Paris. And finally it is important to remember that our programming comes in three main batches. Because of the prolonging of our childhood through neoteny we have a whole new batch of programming for being children. As Sri Ramakrishna said, "The ego of a child is nothing like the ego of a grown-up man." They both make sand castles at the beach. The kid's run through them with their feet, but the grown-ups take

pictures. We have an older batch of programming for being adults. Yet by now we also have a third batch for extended parenthood.

The prime directives of the genetic programming are two-fold. First, to direct a stream of negative entropy upon ourselves and upon our children by eating, breathing, and feeding the kids, which fall mainly to the parenting batch. And second, to pass on the genetic line, which falls mainly to the adult batch. Regardless, children don't follow either one of the prime directives. The children are "immune." And we have it in us to hang on to this immunity. We are the children of children who never grow up.

In the light of this genetic past it is easy to see that the continuance of the curiosity and wonder of childhood into later life is the hallmark of our species. And in the light of what happened to us on the beaches of Africa it is easy to see that monasticism is a natural extension of the immunity of childhood to the disquietude of the prime directives. Monastics neither earn their keep, nor pass on the genetic line, but continue in the wonder of childhood. And finally, it is easy to see that the curiosity of the scientist about the world in which we live, and the wonder of the saint about what lies beyond, will continue to drive us to the end.

OPPOSITES

What we usually think of as opposites are two things that are identical in some way but opposite in another, like up and down. They are identical in that they are measured along the gravitational gradient, but opposite in that they are measured in different directions along that gradient. Now if we see the Universe as made up of protons and electrons, and if we see gravity and electricity as opposites, then the question is: In what way are they identical, and in what way are they opposite?

They are identical in that both operate on what we call the inverse square law. If the particles are twice as far apart, both the gravitational and the electrical field fall off to one quarter. But they are opposite in that their fields are directed in opposite directions. Gravity is condensational, in that it pulls protons toward each other. And electricity is dispersional, in that it pushes protons apart. Also, gravity and electricity are identical in that the gravitational rest energy of the protons, due to their dispersion in the gravitational field, is the same thing as their electrical rest energy, due to their condensation in the electrical field.

Since Einstein has already shown the connection between acceleration and gravity, perhaps we should see a merry-go-round as having a two-dimensional, dispersional, gravitational field with a Coriolis Effect. If, then, we consider electricity as a three-dimensional, dispersional, gravitational field, then it would appear that magnetism is the Coriolis Effect of electricity. Like the Coriolis Effect of the merry-go-round, it operates perpendicular to the direction of motion and proportional to the speed.

These ideas occurred to me in the Vedanta monastery nearly half a century ago, and Michael Fell, charmed by the ideas, was sure that they had been used before. So he promised to look it up when he got to Cal Tech, and he later reported no sign of it.

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Origins

[This essay is John Dobson's answers to a questionnaire from the 1993 Parliament of Religions; also printed in Cosmic Beginnings & Human Ends: Where Science & Religion Meet, 1995]

QUESTION #1: *What are your views on cosmic beginnings, particularly with reference to the origins of the Universe, of life, and of homo sapiens?*

THE ORIGIN OF THE UNIVERSE

For one who feels that the Big Bang cosmology is not well supported by the observational evidence, and for one who suspects that the Universe may not have had a beginning at all, any discussion of "cosmic beginnings" with respect to the "origin" of the Universe must take a rather odd look. If the Universe could be "actual", i.e. if it could have arisen through some process of physics, then its beginning could be considered to be a "happening in time" and a discussion of "origins" would be in order. But if, as I have suggested, the Universe might be "apparitional" rather than actual, then the discussion of origins must take the form of an investigation into the nature of the apparition. *We must know what might be behind the apparition, what are the consequences of such an apparition, and whether they correspond to what we see.* Also we should see whether or not the notion that the Universe is apparitional might help explain some of the things which heretofore we have had to take for granted.

For example, Newton's laws of motion take inertia for granted. Special Relativity takes space and time for granted. General Relativity takes gravity for granted. Quantum Electrodynamics takes electricity for granted as well as Heisenberg's Uncertainty Principle and Pauli's Verbot (Pauli's Exclusion Principle). But must we take all these for granted? Or can we, along with the Advaita Vedantins, put an "apparitional first cause" under our physics?

In the Big Bang models everything we see must be traced back to the original fireball. In the Steady State models everything must be traced back to the primordial hydrogen which is made of electricity and inertia and which is falling together by gravity into galaxies and stars. The question is: can we understand that this primordial hydrogen, with its gravity, electricity, and inertia might arise apparitionally from what underlies the apparition? Can we, in light of this apparitional model, understand why the electron doesn't sit down on the proton in a hydrogen atom in spite of the enormous electrical attraction between them? Can we understand why the spin-one-half particles obey Fermi-Dirac statistics? That is, why they obey Pauli's Verbot?

To ask what might exist behind such an apparition is to ask what might exist in the absence of matter, energy, space, and time. It is actually easy to get an answer to that question in terms of negation. In the absence of time we are left with the changeless, since change can only take place in time. And since smallness and dividedness can exist only in space, in the absence of space we are left with the infinite, the undivided.

What I am suggesting is that by seeing what we see *as if* in space and time, we might have mistaken the Changeless, the Infinite, and the Undivided for something else. And the question is whether that something else could be expected to take the form of the Universe as we see it. I am suggesting that the nature of the apparition is seeing what we see as if in space and time – that what is behind the apparition is the Changeless, the Infinite, and the Undivided. So our remaining issue is: *what would be the consequences of such an apparition? And do these consequences correspond to what we see?*

Now this “apparitional causation”, as I call it, was analyzed a long time ago in India by the Advaita Vedantins and the Buddhists and they came to some very interesting conclusions. They pointed out that in order to mistake a rope for a snake you must fail to see the rope rightly (as might happen in the dimness of twilight). This failure to see rightly they called the veiling power of *tamas*. Next you must jump to the wrong conclusion (that is, see a snake instead of a rope). This they called the projecting power of *rajas*. However they also pointed out that you must have seen the rope to begin with (in the partial light of twilight) or the mistake might have taken some more arbitrary form. This aspect they called the revealing power of *sattva*. It refers to the fact that the length and diameter of the “real” rope are simply misinterpreted as the length and diameter of a snake. [But they are always seen.]

This “apparitional causation” was referred to by the Vedantins as *vivarta*. It was contrasted with *parinama*, or “transformational causation” which is what happens when milk is transformed into buttermilk, or when gravitational energy is transformed into kinetic energy in the downward swing of a pendulum. Note that what we ordinarily think of nowadays as “causation” is what the Vedantins called *parinama*. It involves the transformation of energy from one form into another without any change in the amount of energy. It is governed by the Conservation laws. That is, the energy that goes into a process at the beginning comes out at the end. The form may change but not the amount.

The Universe is made out of energy. Since it is made out of energy it cannot have arisen by transformation, except from energy. But by our laws of physics it cannot arise out of nothing. You can get a Universe out of a Universe by “transformational causation”, but you can not get it *out of nothing*. However, the Universe *can* arise from an “underlying existence” by apparition.

If the "origin" of the Universe is "apparitional", and the nature of the apparition is seeing what we see as if in space and time, and if what is behind the apparition is the Changeless, the Infinite, and the Undivided, then there will be very clear consequences. The consequences of such an apparition would be that we would see the Changeless as is changing, the Infinite as if finite, and the Undivided as if divided. However, because of the revealing power we must always still see the Changeless in the changing, and that is what I see as Inertia. We must always still see the Infinite in the finite, and that is what I see as the electrical charge of the miniscule particles. And we must always still see the Undivided in the divided, and that is what I see as gravity. Thus far these consequences *do* correspond to precisely what we see. And these consequences also provide a possible explanation for gravity, electricity, and inertia which heretofore we have simply had to take for granted.

As I see it the only reason the Universe is energetically "wound up" is because it is apparitional. Remember, in an apparition the "underlying existence" *must* show through. Otherwise the dispersed particles could stay dispersed. What would be the need for gravity if the Undivided didn't *have* to show through in the apparition? Similarly the minuscule particles could remain "uncharged". What would be the need for the electrical charge if the Infinite didn't *have* to show through in the apparition? And why should matter show inertia? Why should it fight every change in its state of motion except for the fact that the Changeless *has* to show in the changes of the apparition? So as I see it, gravity, electricity, and inertia are simply the nature of the "underlying existence" showing through an apparition by the process the Vedantins refer to as the revealing power.

We see as a pair of opposites [in a primordial hydrogen atom] a gravitational "plurality" up against an electrical "duality". That is, the gravitational rest energy of the proton is related to its separation in the gravitational field from *all of the rest of the matter* in the observable Universe whereas its electrical rest energy is related *only to its smallness* in the electrical field and its separation from *a single electron*. If the Universe is "apparitional" something must prevent the demise of the electrical "duality" in the presence of the gravitational "plurality". As I see it, this is the reason why matter obeys the Heisenberg Uncertainty Principle. Likewise, something must prevent the demise of the gravitational "plurality" in the presence of the electrical "duality". And that, as I see it, is why spin-one-half particles obey Fermi-Dirac statistics or Pauli's Verbot. (Note here that the demise of the electrical "duality" is *not* prevented for an electron and a positron or for a proton and an anti-proton. However in the presence of the gravitational *dissimilarity* of the electron and the proton in the primordial hydrogen it is prevented by the Heisenberg Uncertainty Principle.) Similarly, two spin-one-half particles (i.e. protons, electrons, and neutrons) in the presence of that "spin-duality" cannot occupy the same energy state. That is, they obey Fermi-Dirac statistics, i. e. Pauli's Verbot. That is what prevents the gravitational collapse of a neutron star.

As I see it the reason we have had to take space and time, gravity, electricity and inertia (as well as Heisenberg's Uncertainty Principle and Pauli's Exclusion Principle) for granted is simply because they *all* arise by "apparition" and not by any "transformation". So in the absence of an understanding of the "first cause" we have had no model on the basis of which we could ever understand them.

If there is anything to my suggestion that the Universe might have arisen by apparition – that the "first cause" might be "apparitional" (and yes it is certainly counter-intuitive) there are some other major implications. It would seem to me that in order to avoid representing any "real" change in the Changeless it must have arisen as pairs of opposites – so that the total linear momentum, the total angular momentum and the total electrical charge of the observable Universe *must be zero*. If it could be shown that there is an overall residual momentum, or residual electrical charge then I should deem that my suggestion has failed. Further, if, as my suggestion seems to imply, hydrogen is the "primordial apparition" then it would seem that *neither* the proton nor the electron should decay. If they both arise by apparition how could they decay by transformation within that apparition? So if it can be shown that the proton does indeed decay then I should suspect that my suggestion may have failed.

[Incidentally] it will be of no use to suggest that *this is [all merely] "metaphysics"* and need not be taken seriously. *Anything which influences the existence or behavior of what we see as matter is within the domain of physics.*

Steady State vs. Big Bang

Since this "apparitional cosmology" rather favors a Steady State model over the Big Bang models perhaps I should say something about what drives the cosmic expansion. Perhaps also I should discuss the source of the background microwave radiation and the "new hydrogen" needed to keep up the cosmic density. Then too I should say something about the helium abundance and about what has come to be called "dark matter".

Cosmic Expansion

Observationally what we see is that all the distant galaxies seem to be running away from us. The simplest and most straightforward explanation is that long ago there was this "Big Bang" explosion and that is what drives the cosmic expansion. (In the Big Bang models this explosion stands without explanation.) In this Steady State model, on the other hand, the energy which drives the cosmic expansion is simply the energy of the radiation which is lost in the expansion. As the galaxies and stars condense their gravitational energy is transformed into radiation and then radiated away into the expanding spaces of the Universe. If the energy of the radiation is lost in the expansion then it *must* drive the expansion.

Background Radiation

In this Steady State model it is the conditions at the border of the observable Universe imposed by the cosmic expansion that are the source of both the microwave background radiation and the "new" hydrogen. As seen by us the radiation from matter seen to be approaching the border is redshifted approaching zero energy. But if the radiation energy approaches zero, so does the particle energy and the particle mass. Then, since radiation going through a field of low-mass particles would be thermalized to 3^0K , it would appear to us as the background radiation. The amount of 3^0K radiation predicted by this model matches what we actually measure. However, the amount predicted by the Big Bang models is at least one order of magnitude too high.

"New" Hydrogen

Near the border the mass of the particles approaches zero. As such the momentum of the particles must also approach zero, and with it our uncertainty in that momentum (you cannot have a big uncertainty about a very small momentum). By Heisenberg's Uncertainty Principle, if our uncertainty in the momentum approaches zero our uncertainty in where the particles are located must approach infinity. As such, these hydrogen particles simply "tunnel" back into the Universe.

Helium Abundance

For the Big Bang models the observed helium abundance is far too low unless most of the matter of the Universe involved in the fireball explosion was of such a nature that it could not be made into helium. It has therefore been suggested by some proponents of the Big Bang model that some 90% to 99% of the matter in the Universe is of such a nature that it responds only to gravity, and not to any of the other forces such as electricity and magnetism which might allow us to detect it. This so called "dark matter" is thought to surround the visible galaxies but not to reside in them. But the problem is that if it responds only to gravity then why doesn't it all fall in?

Dark Matter

For a Steady State model there is no problem about the "dark matter" being ordinary matter because the visible galaxies could actually be expected to be surrounded by what I call "hovering layers" of ordinary matter blown out by the stellar winds. When a cluster of stars condenses from a cloud of gas some 90% to 99% of the material in the cloud could be expected to be blown away by the stellar winds of the cluster. Since the diameters of these hovering layers may be five to ten times the diameters of the associated galaxies their densities might be below one percent of the densities of their associated galaxies. The detection of this material might be rendered problematical simply by its low density.

THE ORIGIN OF LIFE

For a Big Bang cosmology, in which the early Universe was extremely hot, a discussion of the origin of life is of course appropriate, since life could not have

been with us from the beginning. But for a Steady State model, in which the Universe is without beginning, perhaps life itself could be without beginning. The question then arises: how could life spread from solar system to solar system or from galaxy to galaxy? Somehow it seems that life must have had a start – that somehow life must arise spontaneously from non-living matter. Yet thus far there is no evidence for this.

Pasteur thought that he had shown that life does not arise from non-living matter but only from previous life. Darwin seems to have taken the other view, namely, that it might have arisen from “some warm pool”. The evidence, of course, is simply that life does exist on this planet, which presumably had a beginning; so if life didn’t come from elsewhere it must have arisen here. But how? *What could pull non-living matter across the border into life?*

Natural selection as Darwin sketched it is a very good mechanism for selecting between two or more genetic programs, but it makes no suggestions as to the origins of the programs. As yet this is an unsolved problem. How about the question of the origin of sentiency and intelligence? Could they have arisen from inert matter?

Sentiency

For any cosmological model in which the Universe is considered to be “actual” the problem of the origin of sentiency and intelligence is insoluble. But if the Universe is “apparitional” then sentiency is in it from the word “go”. Even the atoms are “sentient”. We have senses for the perception of gravity, kinetic energy, radiation, electricity, and magnetism because the individual protoplasmic cells can respond to these same five kinds of energy. And the cells can respond to them because the atoms respond to them. The atoms themselves respond to gravity, kinetic energy, radiation, electricity, and magnetism. The plumb bob “knows” where the Earth is and the electron “knows” where the proton is. Sentiency is in this from the word “go” because the “underlying existence” is “involved” in what we see and it must show through.

It is hopeless to expect that something like sentiency or intelligence, or anything for that matter, could arise by “evolution” (as, for example, a rose evolves from a bud), unless it was first put in by “involution”. The reason the oak tree can “evolve” from the acorn is because it was first put in the acorn through “involution” by the parent trees. In the case of the tree and the acorn the “involution” is by “transformational causation” or *parinama*. Whereas in the case of the “underlying existence and the observable Universe the “involution” is by “apparitional causation” or *vivarta*. What underlies the Universe is involved by apparition in us and what we see. And since what underlies all this is infinite there is no knowing what may evolve.¹

¹ c.f. Teilhard de Chardin: “In the world, nothing could ever burst forth as final across the different thresholds successively traversed by evolution (however critical they may be) which has not

The expectation that sentiency and intelligence might arise from "inert matter" is contrary to all the experience of our race. However, matter is not inert. It is "ert" (i.e. it moves by itself) because what underlies the apparition shows through. The notion that what is more might evolve from what is less is beyond the domain of reason.

Intelligence

So sentiency arises by apparition and is with us from the word "go", but how about intelligence? Intelligence as we know it is associated with the egos of poly-celled organisms, like ourselves, who have brains. Brains come down through a long "transformational past". Even our individual brains have a "transformational past" from a single cell to where we are now. Each of our bodies is made up of a very great number of cells and yet we have no awareness of the egos of those individual cells. Still, each of us, at the time of conception, was once a one-celled organism without a brain. Regardless, that single cell had a complete human form "transformationally" involved in its genetic code through the grace of our parents.

So although sentiency might arise "apparitionally" it looks as though intelligence arises "transformationally". It looks as though intelligence, like egotism, is a genetic invention which favors survival. And it also looks as though what we proudly think of as our "advanced" state of intelligence was forced upon us by the use of tools and language.

The "underlying existence" shows through in what we see. What difference does it make whether you think of It s the Formless, or call it Mother, or Father? The question that remains is this: *does the pull of the "underlying existence" (the Changeless, the Infinite, and the Undivided) pull matter across the border from the non-living to the living? Does it pull sentiency to intelligence? Does it pull the saints to final beatitude?*

Through the discrimination between plus and minus in the electrical duality that Oneness holds the electrons near the protons in the hydrogen. Through the discrimination between up and down in the gravitational plurality that Oneness falls the hydrogen together into clouds. And through the discrimination between spin-up and spin-down it pulls the particles together in pair to make molecules and the entire atomic table.

Does that Oneness, through molecular discrimination, pull what we see as matter into life? Does it, through the discriminations of the ego, pull sentiency to intelligence? And does it, through the discrimination between the real and the make-believe, pull the emotions of the saints to the goal?

already existed in an obscure and primordial way..." *Phenomenon of Man*. New York: Harper and Row, 1955. Book One, Chapter 3, Section I B.

We are like Xerox machines looking for Xerox machines to copy. Because the "underlying existence" shows through in us we are pulled toward peace and love and freedom, and we look for them in others. If we see a special manifestation of peace and serenity, or of love and happiness, or of strength and freedom, or of compassion, our hearts open and we are drawn to it. All animals, when they mate, pick our species characteristics, and so do we. It is probably our tendency to breed in this direction that has separated us so far from other animals. And in this tendency I see the hope for our future.

THE ORIGIN OF HOMO SAPIENS SAPIENS

About the origin of *Homo sapiens sapiens* it should be said that although formerly it was considered a great mystery, and there was a great deal of talk about the "missing link" (that is, what happened between the chimps and ourselves), by now this mystery has largely been cleared up. What happened between the chimps and us has been fairly well investigated by Sir Alister Hardy, Desmond Morris, Elaine Morgan, Leon P. La Lumiere, Jr., and others.² It now seems more than likely that a few of our chimp-like ancestors, dwelling in a mountainous area of northeast Africa some ten or fifteen million years ago, were cut off from the mainland by a rise in the sea level which reduced our homeland to an island. Gradually as our local jungles dwindled we were forced more and more to forage at the beach. And what I should like to say here is that it is what happened at that beach that led up to this Parliament of Religions. It is what happened at that beach that separated us from the chimpanzees and led to our propensity for science and religion.

Often in my youth it was suggested by the anthropologists that first we somehow (miraculously?) developed this big brain and then invented language and the use of tools. But no one thinks like that now. Nowadays it is more or less taken for granted that we were forced by our situation to the use of tools and language and that that is what imposed on us the need for a bigger brain.

Tools

Anyone who has foraged at the beach knows that the easily available protein supply comes mostly packaged in calcium carbonate shells which require to be broken open with a stone. Any chimp could see that. Louis Leaky found that the early stone tools of our ancestors in Olduvai Gorge were made of "stream-rounded boulders". Why? Because we came from the beach where all the stones were rounded and where we used them for procuring food.

Language

Surely it was there at the beach, where our body language failed in the surf, that we were forced to use speech. Elaine Morgan in *The Aquatic Ape* rightly points

² Morgan, Elaine. *The Aquatic Ape*. New York: Stein and Day, 1892.

out that speech cannot arise until breath control arises, and breath control arises in the water. We already had our body-language, which, as Desmond Morris points out in *The Naked Ape*, is easily understood by the chimps, the gorillas, the oranges and ourselves. But what good is dancing in the sea? We needed another means of communication more suitable in the water. All the other animals on this planet who talk (namely the dolphins and the whales), do it in the sea.

Aquatic Adaptations

Although the temperature of the water at our beach was nearly 90° F, the shift from the jungle to the beach must have imposed on us a severe pressure to change. We needed feet instead of hands on our lower extremities for paddling sand and water. We needed a cushion on our buttocks for sitting in the sand. We needed fat under the skin for buoyancy and streamlining in the water, we did not need our fur. We grew hair on our heads for the sake of children in the water, and learned to fight with our fists to protect them from the sharks. It is fortunate for us that the dolphins beat us back to the sea and reprogrammed the sharks against blunt punches. No land animal will yield to your fists.

Neoteny

Now one of the genetic mechanisms which we used in our forced adjustment to the beach is what is called *neoteny*, the retaining into later life of juvenile characteristics. We delayed the invasion of our childhood by our more adult point of view. House cats, like most animals, reach the adult stage in about a year, and then the insatiable curiosity of the kitten dies away. But not for us. Our brain continues to grow, and our insatiable curiosity lingers on. Out of that lingering curiosity arose science and religion. It is our lingering curiosity that led up to this Parliament.

Science and Religion

We are the children of children who never grew up. It is the lingering wonder of childhood which gave rise to Newton's *Principia*, to Einstein's Relativity, to quantum mechanics, and to all the religions of the world. It was there at that beach that we learned the breath control of the yogis. It was at that beach that we learned to talk and to sing. Our hymns and our prayers and our yearning to know arose at that beach and follow us still. The beauty and freedom of childhood follow us still, but in order that our childhood could be free the responsibility for our upkeep has been thrown on our parents. The prolonging of our youth has imposed on us the prolonging of our parenting. Our youth and our parenting are not like those of other animals. Like them we have genetic programming to see us through our adult phase and to persuade us to pass on the genetic line. But unlike them we also have genetic programming to see us through a prolonged childhood and a prolonged period of parenting which is required to support it. Children do not fulfill the prime directives of the genetic programming, namely, to keep ourselves alive and well and to pass on the genetic code. Our parents must do it for us. Out of this beauty and freedom of

our childhood monasticism arose. "...Turned from home and toil and kindred, leaving all for His dear sake..." The monks and nuns neither earn their keep, nor pass on the genetic line, but continue instead in the wonder of childhood: "*What or Who is beyond what I see?*"

QUESTION #2: *What do you think should be the relationship between religion and science?*

I feel that religion and science should meet and shake hands – *but it won't happen until the "first cause" is put under our physics.* If some important (well known) physicist, say John Archibald Wheeler or Stephen Hawking were to notice that relativity and quantum mechanics are evidence that the Universe is "apparitional" rather than "actual", then the news would spread worldwide in a week. I used to hope that Richard Feynman would notice it, but now he is gone.

The mystics already see that the world is apparitional. Regardless of what they say from the pulpit or what they write in their books, they all see the Universe as apparitional because they all agree that faith is at the root of spiritual practice. If the world were "actual" faith would have no part in it. When milk has been made into buttermilk, faith that it is actually milk will get you nowhere. But if you have mistaken a rope for a snake, faith that it is actually a rope ends the problem.

Fritjof Capra wrote a very interesting book called the *Tao of Physics* in which he points out similarities in the language of the mystics and the physicists. As I see it the reason for these similarities is that they are both describing an "apparitional world". In actual transformation, like milk into buttermilk, there is no confusion of language. First there is milk, then there is a process, and finally there is buttermilk. However, if one has mistaken a rope for a snake and I ask, "Is there a snake?", and you answer, "Yes", then I say, "Show me!" If you answer, "No", I say, "Kick it!" This sort of confusion runs all through the writings of the mystics and the scientists simply because the world is apparitional. If the mystics and the scientists could agree that the "first cause" behind what we see is apparitional we could all sit down together and have a talk – we could meet and shake hands.

The mystics take existence for granted and want to get from "here" to "there", (to see behind the apparition), and that is possible. But for the most part the scientists take non-existence for granted and want to get from "there" to "here", and that is not possible. Nothing does not become something. Even if you accept Swami Vivekananda's point of view that the Universe is the Absolute seen through the screen of time, space, and causation, you still cannot ask how "That" became this. The Absolute does not become the Universe. The Universe is only an appearance, a misinterpretation. "When will they ever learn?"

The question is not, "How did "That" become this?", but, "Why do I continue to see it this way?" And that comes down through a long line of ancestry as a genetic predilection. The Undividedness which shows in matter as gravity shows

in us as love, but the genes have us chase it in ways that give rise to offspring. This doesn't require an explanation. The Infinite which shows in matter as electrical charge shows in us as our yearning for freedom, but the genes have us chase it by eating and breathing and keeping the body strong and well. And the Changeless which shows in matter as inertia shows in us as our yearning for peace and security for the body. These are prime directives of our genetic programming which have come down to us from a distant past through a long line of ancestors who followed the dictates of the genes. Because of our long sojourn at the beach in Africa a few million years ago our children don't follow the prime directives of the genetic programming. They neither procure their own food nor pass on the genetic code, and neither do monks and nuns.

Science is a map to tell us where we are and how we got there. Religion is a journey. But there needn't be a conflict between the cartographer and the pilgrim.

QUESTION #3: *What are your views on human ends, especially as this relates to the framework of cosmic beginnings?*

The aim of science is to make a better map, and what is needed is a better understanding of the "first cause". The aim of religion is to help the pilgrims on their way, to help them see beyond the screen, and what is needed is a better map by which to chart the journey. Both science and religion are investigations into the nature of the world and our place in it. How did we get here and where do we go? What is also needed is the simple recognition that we are all pilgrims on whatever paths, headed for the same goal. Our problem now is to get beyond the thralldom of the genes, to discriminate between the "underlying existence" and the "apparition", between the "real" and the make-believe, and to let the make-believe go. Individually we can do it even now. Can we do it as a race? Will our genetic programming ever reach a point where this is easier?

John L. Dobson
December 1993

Questionnaire

QUESTION #1: What are your views on cosmic beginnings, particularly with reference to the origins of the universe, of life, and of homo sapiens?

THE ORIGIN OF THE UNIVERSE

For one who feels that the Big Bang cosmology is not well supported by the observational evidence, and for one who suspects that the Universe may not have had a beginning at all, any discussion of "cosmic beginnings" with respect to the "origin" of the Universe must take on a rather odd look. If the Universe could be "actual", i.e. if it could have arisen through some process of physics, then its beginning could be considered to be a "happening in time" and a discussion of "origins" would be in order. But if, as I have suggested, the Universe might be apparitional, rather than actual, then the discussion of origins must take the form of an investigation into the nature of the apparition. *We must know what might be behind the apparition, what are the consequences of such an apparition, and whether they correspond to what we see.* Also, we should see whether or not the notion that the Universe is apparitional might help to explain some of the things which heretofore we have had to take for granted.

For instance, Newton's laws of motion take inertia for granted. Special relativity takes space and time for granted. General relativity takes gravity for granted. Quantum electrodynamics takes electricity for granted as well as Heisenberg's uncertainty principle and Pauli's Verbot (Pauli's exclusion principle). But must we take all this for granted? Or can we, with the Advaita Vedantins, put an apparitional first cause under our physics?

Although in the Big Bang models everything we see must be traced back to the original fireball, in a Steady State model everything must be traced back to the primordial hydrogen, made of electricity and inertia, and falling together by gravity to galaxies and stars. And the question is: can we understand that this primordial hydrogen with its gravity, electricity, and inertia could arise apparitionally from what underlies the apparition? And can we, in the light of this apparitional model, understand why the electron doesn't sit down on the proton in a hydrogen atom (in spite of the enormous electrical attraction between them), and why the spin-one-half particles obey Fermi-Dirac statistics? (i.e. why they obey Pauli's Verbot?)

To ask what might exist behind such an apparition is to ask what might exist in the absence of matter, energy, space and time, and it is easy to get an answer to that question in terms of negation. In the absence of time we are left with the changeless, since change can take place only in time. And since smallness and dividedness can exist only in space, in the absence of space we are left with the infinite, the undivided.

So what I am suggesting is that by seeing what we see as if in space and time, we

might have mistaken the changeless, the infinite, the undivided for something else. And the question is whether that something else could be expected to take the form of the Universe as we see it. I am suggesting that the nature of the apparition is seeing what we see as if in space and time, and that what's behind the apparition is the changeless, the infinite, the undivided. *So our remaining question is: what would be the consequences of such an apparition, and do these consequences correspond to what we see?*

Now this apparitional causation, as I call it, was analyzed a long time ago in India by the Advaita Vedantins and the Buddhists, and they came to some very interesting conclusions. They pointed out that in order to mistake a rope for a snake you must fail to see the rope rightly (as in the twilight). This they called the veiling power of *tamas*. Then you must jump to the wrong conclusion (that it's a snake). This they called the projecting power of *rajas*. But also they pointed out that you must have seen the rope to start with (in the partial light of twilight) or the mistake might have taken some more arbitrary form. This they called the revealing power of *sattva*. The length and diameter of the rope are simply misinterpreted as the length and diameter of a snake.

This apparitional causation was referred to by the Vedantins as *vivarta*, and it was contrasted with *parinama*, transformational causation, (as when milk is transformed into buttermilk, or as when gravitational energy is transformed into kinetic energy in the downward swing of a pendulum). What we ordinarily think of nowadays as causation is what the Vedantins called *parinama*. It involves the transformation of energy from one form to another without any change in the amount. And it is governed by the conservation laws. The energy that goes into a process at the beginning comes out at the end. The form may change but not the amount. Now, since the Universe is made out of energy, it cannot have arisen by transformation, except from energy. It cannot arise from nothing. *You can get a Universe out of a Universe by transformational causation, but you can't get it out of nothing. However, it can arise from the underlying existence by apparition .*

So if the "origin" of the Universe is apparitional, and if the nature of the apparition is seeing what we see as if in space and time, and if what's behind the apparition is the changeless, the infinite, the undivided, then the consequences of such an apparition would be that we would see the changeless as if changing, the infinite as if finite, and the undivided as if divided. But, because of the revealing power, we must have seen the changeless in the changing, and that is what I see as inertia; we must have seen the infinite in the finite, and that is what I see as the electrical charge of the minuscule particles; and we must have seen the undivided in the divided, and that is what I see as gravity. And thus far these consequences *do* correspond to what we see. And they also provide a possible explanation for gravity, electricity and inertia, which heretofore we have had to take for granted.

As I see it, the only reason the Universe is energetically wound up is because it is apparitional. (In an apparition the underlying existence *must* show through.) Otherwise

the dispersed particles could stay dispersed. What would be the need for gravity if the undivided didn't have to show through in the apparition? And the minuscule particles could remain uncharged. What would be the need for the electrical charge if the infinite didn't have to show through in the apparition? And why should matter show inertia? Why should it fight every change in its state of motion except for the fact that the changeless has to show in the changes of the apparition? As I see it, gravity, electricity, and inertia are simply the nature of the underlying existence showing through in the apparition through what the Vedantins call the revealing power.

We see (as a pair of opposites) a gravitational "plurality" against an electrical "duality". That is, the gravitational rest energy of the proton is related to its separation in the gravitational field from all the rest of the matter in the observable Universe, whereas its electrical rest energy is related only to its smallness in the electrical field and to its separation from a single electron. But if the Universe is apparitional, something must prevent the demise of the electrical duality in the presence of the gravitational plurality. As I see it, that is why matter obeys Heisenberg's uncertainty principle. And likewise, something must prevent the demise of the gravitational plurality in the presence of the duality. And that, as I see it, is why spin-one-half particles obey Fermi-Dirac statistics, or Pauli's Verbot. (The demise of the electrical duality is not prevented for an electron and a positron or for a proton and an anti-proton. But in the presence of the gravitational *dissimilarity* of the electron and the proton in the primordial hydrogen, it is prevented by Heisenberg's uncertainty principle.) Similarly, two spin-one-half particles (i.e. protons, electrons, and neutrons) in the presence of that spin-duality cannot occupy the same energy state. (That is, they obey Fermi-Dirac statistics, i.e. Pauli's Verbot.) That's what prevents the gravitational collapse of a neutron star.

As I see it, the reason we had to take space and time, gravity, electricity and inertia, as well as Heisenberg's uncertainty principle and Pauli's exclusion principle for granted is simply because they all arise by apparition and not by any transformation. So in the absence of an understanding of the "first cause" we had no model on the basis of which we could understand them.

If there is anything to this suggestion, i.e. that the Universe might have arisen by apparition--that the first cause might be apparitional (and it's certainly counter-intuitive), then it would seem to me that in order to avoid representing any change in the changeless it must have arisen as pairs of opposites so that the total linear momentum, the total angular momentum and the total electrical charge of the observable Universe should be zero. If it could be shown that there is an overall residual momentum or electrical charge, I should deem this suggestion to have failed. And if, as this suggestion seems to imply, hydrogen is the primordial apparition, then it would seem that neither the proton nor the electron should decay. If they arise by apparition, how could they decay by transformation within that apparition? If it can be shown that the proton does indeed decay, then I should suspect that this suggestion may have failed.

It will be of no use to suggest that this is metaphysics and need not be taken seriously. Anything which influences the existence or behavior of what we see as matter is within the domain of physics.

Steady State vs. Big Bang

Since this appositional cosmology rather favors a Steady State model over the Big Bang Models, perhaps I should say something about what drives the cosmic expansion. Perhaps, also, I should discuss the source of the microwave background radiation and the "new hydrogen" needed to keep up the cosmic density. Then, too, I should say something about the helium abundance and about what has come to be called the "dark matter".

Cosmic Expansion

Observationally, what we see is that all the distant galaxies seem to be running away from us. And the simplest and most straightforward explanation is that long ago there was this Big Bang explosion and that that is what drives the cosmic expansion. (In the Big Bang models, this explosion stands without explanation.) In this Steady State model, on the other hand, the energy which drives the cosmic expansion is simply the energy of the radiation which is lost in the expansion. As the galaxies and stars condense, their gravitational energy is transformed to radiation and radiated away into the expanding spaces of the Universe. If the energy of the radiation is lost in the expansion, then it *must* drive the expansion.

Background Radiation

In this Steady State model it is the conditions at the border of the observable Universe imposed by the expansion that are the source of both the background radiation and the "new hydrogen". As seen by us, the radiation from matter seen to be approaching the border is redshifted approaching zero energy. But if the radiation energy approaches zero, so does the particle energy and the particle mass. Then, since radiation going through a field of low-mass particles would be thermalized to 3K, it would appear to us as the background radiation. The amount of 3K radiation predicted by this model matches what we measure. The amount predicted by the Big Bang model is at least one order of magnitude too high.

"New Hydrogen"

Also, near the border, where the mass approaches zero, the momentum of the particles must also approach zero, and with it, our uncertainty in that momentum. (You can't have a big uncertainty about a very small momentum.) Then, by Heisenberg's uncertainty principle, if our uncertainty in the momentum approaches zero, our uncertainty in where the particles are must approach infinity. The hydrogen simply "tunnels" back in.

Helium Abundance

For the Big Bang models, the observed helium abundance is far too low unless most of

the matter of the Universe involved in the fireball explosion was of such a nature that it could not be made into helium. It has therefore been suggested by some proponents of the Big Bang model that some 90% to 99% of the matter in the Universe is of such a nature that it responds only to gravity, and not to any of the other forces such as electricity and magnetism which might allow us to detect it. This "dark matter", as it is called, is thought to surround the visible galaxies, but not to reside within them. And the problem is, that if it responds only to gravity, why doesn't it all fall in?

Dark Matter

For a Steady State model, there is no problem about the dark matter being ordinary matter, because the visible galaxies could be expected to be surrounded by what I call "hovering layers" of ordinary matter blown out by the stellar winds. When a cluster of stars condenses from a cloud of gas, some 90% to 99% of the material in the cloud could be expected to be blown away by the stellar winds of the cluster. Since the diameters of these hovering layers may be five to ten times the diameters of the associated galaxies, their densities might be well below one percent of the densities of the associated galaxies. The detection of this material might be rendered problematical simply by its low density.

THE ORIGIN OF LIFE

For a Big Bang cosmology, in which the early Universe was extremely hot, a discussion of the origin of life is of course appropriate, since life could not have been with us from the beginning. But for a Steady State model, in which the Universe is without beginning, perhaps life itself could be without beginning. However, the question then arises: how could it spread from solar system to solar system or from galaxy to galaxy? Somehow it seems that life must have had a start, that somehow life must arise spontaneously from non-living matter. Yet thus far there is no evidence for this.

Pasteur thought that he had shown that life does not arise from non-living matter but only from previous life. Darwin seems to have taken the other view, namely, that it might have arisen from "some warm pool". The evidence, of course, is simply that life does exist on this planet, which presumably had a beginning; so if life didn't come from elsewhere, it must have arisen here. But how? *What could pull non-living matter across the border into life?*

Natural selection as Darwin sketched it is a very good mechanism for selecting between two or more genetic programmings, but it makes no suggestion as to the origin of the programs. And as yet this is an unsolved problem. But how about the origin of sentiency and intelligence? Could they have arisen from inert matter?

Sentiency

For any cosmological model in which the Universe is considered to be "actual", the problem of the origin of sentiency and intelligence is insoluble. But if the Universe is apparitional, sentiency is in it from the word "go". Even the atoms are "sentient". We.

have senses for the perception of gravity, kinetic energy, radiation, electricity and magnetism, because the individual protoplasmic cells can respond to these same five kinds of energy. And the cells can respond to them because the atoms respond to them. The atoms themselves respond to gravity, kinetic energy, radiation, electricity and magnetism. The plumb bob "knows" where the Earth is, and the electron "knows" where the proton is. Sentiency is in this from the word "go", because the underlying existence is "involved" in what we see and must show through.

It is hopeless to expect that something like sentiency or intelligence, or anything, for that matter, could arise by "evolution" (as a rose evolves from a bud), unless it was first put in by "involution". The reason the oak tree can "evolve" from the acorn is because it was first put in the acorn through "involution" by the parent trees. But in the case of the tree and the acorn, the involution is by transformational causation, *parinama*. Whereas, in the case of the underlying existence and the Universe, the involution is by apparitional causation, or *vivarta*. What underlies the Universe is involved by apparition in us and what we see. And since what underlies all this is infinite, there is no knowing what may evolve.¹

The expectation that sentiency and intelligence might arise from "inert matter" is contrary to all the experience of our race. But matter is not inert. It is "ert", (it moves by itself) because what underlies the apparition shows through. And the notion that what is more might evolve from what is less is beyond the domain of reason.

Intelligence

So sentiency arises by apparition and is with us from the word "go". But how about intelligence? Intelligence, as we know it, is associated with the egos of poly-celled organisms, like ourselves, who have brains. And brains come down through a long transformational past. Even our individual brains have a transformational past from a single cell, to where we are now. Each of our bodies is made up of a very great number of cells, and we have no awareness of the egos of the individual cells. Yet each of us, at the time of conception, was a one-celled organism without a brain. However, that single cell had a complete human form transformationally involved in its gene code through the grace of our parents.

So, although sentiency might arise apparitionally, it looks as though intelligence arises transformationally. It looks as though intelligence arises from sentiency as a genetic invention of the ego. It looks as though intelligence, like egotism, is a genetic invention which favors survival. And it looks as though what we proudly think of as our advanced state of intelligence was forced upon us by the use of tools and language.

So the underlying existence shows through in what we see. What difference does it

¹ c.f. Teilhard de Chardin: "In the world, nothing could ever burst forth as final across the different thresholds successively traversed by evolution (however critical they be) which has not already existed in an obscure and primordial way..." (*Phenomenon of Man*. New York:Harper and Row, 1955. Book One, Chapter Three, Section I B.)

make whether you think of it as The Formless, or call it Mother, or Father? The question that remains is this: *does the pull of the underlying existence (the changeless, the undivided, the infinite) pull matter across the border from the non-living to the living? Does it pull sentiency to intelligence? And does it pull the saints to final beatitude?*

Through the discrimination between plus and minus in the electrical duality, that oneness holds the electrons near the protons in the hydrogen. Through the discrimination between up and down in the gravitational plurality, that oneness falls the hydrogen together into clouds. And through the discrimination between spin-up and spin-down, it pulls the particles together in pairs to make molecules and the entire atomic table.

Does that oneness, through molecular discrimination, pull what we see as matter into life? Does it, through the discriminations of the ego, pull sentiency to intelligence? And does it, through the discrimination between the real and the make-believe, pull the emotions of the saints to the goal?

We are like Xerox machines looking for Xerox machines to copy. And because the underlying existence shows through in us, we are pulled toward peace and love and freedom, and we look for them in others. If we see a special manifestation of peace and serenity, or of love and happiness, or of strength and freedom, or of compassion, our hearts open and we are drawn to it. All animals, when they mate, pick out species characteristics, and so do we. It is probably our tendency to breed in this direction that has separated us so far from other animals. And in this tendency, I see the hope for our future.

THE ORIGIN OF HOMO SAPIENS SAPIENS

About the origin of *Homo sapiens sapiens*, it should be said that although formerly it was considered a great mystery, and there was a great deal of talk about the missing link, (that is, what happened between the chimps and ourselves), by now this mystery has been largely cleared up. And what happened between the chimps and us has been fairly well investigated by Sir Alister Hardy, Desmond Morris, Elaine Morgan, Leon P. La Lumiere, Jr., and others.² It now seems more than likely that a few of our chimp-like ancestors, dwelling in a mountainous area of northeast Africa some ten or fifteen million years ago, were cut off from the mainland by a rise in sea level which reduced our homeland to an island. Gradually, as our local jungles dwindled, we were forced more and more to forage at the beach. And what I should like to say here is that it is what happened at that beach that led up to this Parliament of Religions. It is what happened at that beach that separated us from the chimpanzees and led to our propensity for science and religion.

Often in my youth it was suggested by the anthropologists that first we somehow (miraculously?) developed this big brain and then invented language and the use of

² Morgan, Elaine. *The Aquatic Ape*. New York:Stein and Day, 1982.

tools. But no one thinks like that now. Nowadays it is more or less taken for granted that we were forced by our situation to the use of tools and language and that that is what imposed on us the need for a bigger brain.

Tools

Anyone who has foraged at the beach knows that the easily available protein supply comes mostly packaged in calcium carbonate shells which require to be broken open with a stone. Any chimp could see that. Louis Leaky found that the early stone tools of our ancestors in Olduvai Gorge were made of "stream-rounded boulders". Why? Because we came from the beach, where all the stones were rounded and where we used them for procuring food.

Language

And surely it was there at that beach, where our body language failed in the surf, that we were forced to use speech. Elaine Morgan, in *The Aquatic Ape*, rightly points out that speech cannot arise until breath control arises, and breath control arises in the water. We already had our body-language, which, as Desmond Morris points out in *The Naked Ape*, is easily understood by the chimps, the gorillas, the orangs and ourselves. But what good is dancing in the sea? We needed another means of communication more suitable in the water. All the other animals on this planet who talk (namely the dolphins and the whales), do it in the sea.

Aquatic Adaptations

Although the temperature of the water at our beach was nearly 90° F, the shift from the jungle to the beach must have imposed on us a severe pressure to change. We needed feet instead of hands on our lower extremities for paddling sand and water. We needed a cushion on our buttocks for sitting on the sand. We needed fat under the skin for buoyancy and streamlining in the water, and we didn't need our fur. We grew hair on our heads for the sake of children in the water, and learned to fight with our fists to protect them from the sharks. It is fortunate for us that the dolphins beat us back to the sea and reprogrammed the sharks against blunt punches. No land animal will yield to your fists.

Neoteny

Now one of the genetic mechanisms which we used in our forced adjustment to the beach is what is called *neoteny*, the retaining into later life of juvenile characteristics. We delayed the invasion of our childhood by our more adult point of view. House cats, like most animals, reach the adult stage in about a year, and the insatiable curiosity of the kitten dies away. But not for us. Our brain continues to grow, and our insatiable curiosity lingers on. Out of that lingering curiosity arose science and religion. It is our lingering curiosity that led up to this Parliament.

Science and Religion

We are the children of children who never grow up. And it is the lingering wonder of childhood which gave rise to Newton's *Principia*, to relativity, to quantum mechanics;

and to all the religions of the world. It was there at that beach that we learned the breath control of the yogis. It was there at that beach that we learned to talk and to sing. Our hymns and our prayers and our yearning to know arose at that beach and follow us still. And the beauty and freedom of childhood follow us still. But in order that our childhood could be free, the responsibility for our upkeep has been thrown on our parents. The prolonging of our youth has imposed on us the prolonging of our parenting. Our youth and our parenting are not like those of other animals. Like them, we have genetic programming to see us through our adult phase and to persuade us to pass on the genetic line. But unlike them we have genetic programming to see us through a prolonged childhood and a prolonged period of parenting which is required to support it. Children don't fulfill the prime directives of the genetic programming, namely, to keep ourselves alive and well, and to pass on the genetic code. Our parents do it for us. Out of this beauty and freedom of our childhood, monasticism arose. "...Turned from home and toil and kindred, leaving all for His dear sake." The monks and nuns neither earn their keep, nor pass on the genetic line, but continue instead in the wonder of childhood: "*What or Who is beyond what I see?*"

QUESTION #3: What do you think should be the relationship between religion and science?

I feel that religion and science should meet and shake hands. *But it won't happen until the first cause is put under our physics.* If some important (well known) physicist, say John Archibald Wheeler or Stephen Hawking, were to notice that relativity and quantum mechanics are evidence that the Universe is apparitional rather than actual, then the news would spread world wide in a week. I used to hope that Richard Feynman would notice it, but he is gone.

The mystics already see that the world is apparitional. Regardless of what they say from the pulpit or what they write in their books, they all see the Universe as apparitional because they all agree that faith is at the root of spiritual practice. And if the world were actual, faith would have no part in it. When milk has been made into buttermilk, faith that it's milk will get you nowhere. But if you have mistaken a rope for a snake, faith that it's a rope ends the problem.

Fritjof Capra wrote a very interesting book called the *Tao of Physics* in which he points out similarities in the language of the mystics and the physicists. Now as I see it, the reason for these similarities is that they are both describing an apparitional world. In an actual transformation, like milk into buttermilk, there is no confusion of language. First there is milk, then there is a process, and finally there is buttermilk. But if one has mistaken a rope for a snake and I ask, "Is there a snake?", and you answer, "Yes", then I say, "Show me!" If you answer, "No", I say, "Kick it!" This sort of confusion runs all through the writings of the mystics and the scientists simply because the world is apparitional. If the mystics and the scientists could agree that the first cause behind what we see is apparitional, we could all sit down together and have a talk--we could

meet and shake hands.

The mystics take existence for granted and want to get from "here to there", (to see behind the apparition), and that is possible. But for the most part the scientists take non-existence for granted and want to get from "there to here", and that is not possible. Nothing does not become something. And even if you accept Swami Vivekananda's point of view that the Universe is the Absolute seen through the screen of time, space and causation, still you cannot ask how that became this. The Absolute does not become the Universe. It is only an appearance, a misinterpretation. "When will they ever learn?"

The question is not, "How did that become this?", but, "Why do I continue to see it this way?" And that comes down through a long line of ancestry as a genetic predilection. The undividedness which shows in matter as gravity shows in us as love, but the genes have us chase it in ways that give rise to offspring. This doesn't require an explanation. The infinite which shows in matter as electrical charge shows in us as our yearning for freedom, but the genes have us chase it by eating and breathing and keeping the body strong and well. And the changeless which shows in matter as inertia shows in us as our yearning for peace and security for the body. These are prime directives of our genetic programming which have come down to us from a distant past through a long line of ancestors who followed the dictates of the genes. But because of our long sojourn at the beach in Africa a few million years ago, our children don't follow the prime directives of the genetic programming. They neither procure their own food nor pass on the genetic code, and neither do monks and nuns.

Science is a map to tell us where we are and how we got there. Religion is a journey. But there needn't be a conflict between the cartographer and the pilgrim.

QUESTION #2: What are your views on human ends, especially as this relates to the framework of cosmic beginnings?

The aim of science is to make a better map, and what is needed is a better understanding of the first cause. The aim of religion is to help the pilgrims on their way, to help them see beyond the screen, and what is needed is a better map by which to chart the journey. Both science and religion are investigations into the nature of the world and our place in it. How did we get here, and where do we go? What is also needed is the simple recognition that we are all pilgrims on whatever paths, headed for the same goal. Our problem now is to get beyond the thralldom of the genes, to discriminate between the underlying existence and the apparition, between the real and the make-believe, and to let the make believe go. Individually, we can do it even now. Can we do it as a race? Will our genetic programming ever reach a point where this is easier?

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