

SCIENCE, TECHNOLOGY AND HUMAN VALUES

May 1-2, 1992

“Facing death : a challenge for Religion and Science”

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Ron Thiemann : I am from Harvard Divinity School, and along with my colleague, Charles Townes helped put this together and to invite you all.

The genius behind the idea of bringing together a group of scientists, humanists, and people in the study of religion really is that of Maurice Marois who is there at the corner of the table. He had, as the director of the Institute de la Vie, in Paris, has been long involved with conferences and research projects that bring together scientists to address some of the most fundamental and important issues that face the human community today, and he has been increasingly convinced that there is a need to broaden the conversation beyond simply the scientific community and to bring those who professionally reflect philosophically, theologically, and the study of religion, on some of the more fundamental questions on human destiny and human nature.

We first met in Moscow in January of 1990 where the conversation turned to the possibility of this kind of cooperative effort, and then in the summer of 1990 Charles Townes hosted a group of people, some of you were there, to begin exploring the idea about whether or not we might want to seek to establish in a more permanent way, an on-going institute or center that would be devote to conversations, research on questions that affect the human condition among scientists, humanists, philosophers and theologians. Today is really the experiment, and we will pursue conversation with one another and you see the structure of this has been to have someone from the religious or philosophical side give an essay with a response from a scientist, then an essay, with a response from the other side. I ask Charles to chair the first half of this session.

Charles Townes : I want to express my welcome and my thanks for all of you gathering here to consider these matter, and particularly express thanks from all of us to Ron Thiemann for the arrangements he has made for this very convenient place and for hosting us here in Cambridge. Let us begin right away now with Lawrence Sullivan’s presentation on **“A Challenge for Religion and Science : Facing Death”**

Lawrence Sullivan : The presentation that I want to give has two parts. The first is a general consideration of the relationship between death, imagination, and the questions that propel human knowledge. I’m assuming that imagination and questions are a part of all of our inquiries, whether it is the side of science, or the study of humanities. And I’m concerned about the relationship at some fundamental level between the images that let us inquire and ask questions and the human experience or image of death in different cultures. I think imagination has a labor that is distinctive of the human species and in this presentation I want to show that the process of imagination develops directly from the human awareness of death. The imagery of the crisis of death therefore becomes the foundation of critical experience, of memory, of knowledge, of science, and that general organized knowledge.

Arguments have been mounted on philosophical grounds that link the awareness of death with the possibility of critical knowledge among humans. Highdigger's case, for example, that human awareness of death creates the possibility of the notion of time and that the corpse provides evidence, or demonstrable experience of a range of ontological states, since he says the corpse is less than a person but more than a presence and begins his rumination on the fundamental experience of different ontological states.

Spinoza held that philosophical knowledge itself was the ability to look upon reality "sub specie aeternitatis", that is from the point of view of eternity, and in his view this was the way the dead look upon existence. To philosophize in some sense then, was to look upon the world as the dead might, something college sophomores are often painfully aware of.

But my plan this morning is not to explore this question from the history of philosophy, in which I'm really not in any way specialized, but to consider the questions from the point of view of the comparative study of religions. In spite of its universality, death has a different story in each religious tradition. That is, each religion pictures the origins of death in a different way. This obedience of the first ancestors in a blissful garden is familiar to the Biblical literature, but not restricted to that. The opening of a bundle or box that should have stayed closed is perhaps the most widespread motif in Africa. The race between two animal messengers, we see the residue of this in the folklore of the tortoise and the hare, one brings the message of life, the other the message of death. Unfortunately in the telling of the tale, death gets there first. Or stealing a look at the first old people, before they had time to do the new skins of youth, once again. There are many more varieties of these themes. Each religious tradition also offers a different account of the history of significant deaths within its tradition. The details of these important deaths become enduring themes in cultural history. The crucifixion of Christ, the martyrdom of the Muslim saint al-Hallj, the death of the Buddha, these become central inspirations for not only art, but also philosophical reflection. And in the life of everyday practice, worship and reflection are centered on the dead. You can see this in Muslim holy shrines, which are built around the remains of a saint, or Buddhist stupas, which contain a relic of the Buddha, and each Roman Catholic altar, even after the reforms of Vatican II contains a tiny bone fragment of a saint. Veneration of the dead becomes a principal religious outlet for cultures in Africa and Oceania.

So there seems in these traditions, and I'm venturing a generalization here that might be even universal, there is no escape from the reality of death, and there is no end to the imagery of death for the living. That is, the imagery of death, including our thinking and our speculative thought, feeds on, or nurses, or works up varieties of the images of death that are central to our cultural traditions. I wanted to point out that we don't have to travel to exotic cultures or world religions to see this; in each of our own daily experiences we see films and novels that use the tropes of death and the images of death as central turning points in the development of plot. An evening's television dramas gives us a number of scenarios of death. I saw a statistic where an average high school senior has seen 18000 violent deaths on television by the time they have arrived at graduation. We see the news which is a different kind of portrayal of these deaths. So some involvement with death pervades every level of being human, from the economic and the artistic to the intellectual and psychological. Whether that means involvement in inheritance patterns, and estate taxes, and life insurance payments to uncontrollable sorrow in death and bad dreams. I find it ironic that peering into death, which at some level presents itself as a deep silence, into which every voice passes, stirs up waves of word and image, anything but silence. Even without our conscience effort, images of dying and afterlife ripple into our nightmares and our sweet dreams.

Advances in medical technology, rather than putting this kind of material to rest, seems to have opened up another vector, or sector of entry. If you think for example of the imagery of death, or perhaps better put, experiences of near death, the numbers of patients undergoing experiences of this kind due to the new technologies of resuscitation have risen dramatically. And their experiences can now become the subject of systematic and unsystematic study. Many of our cultural peers are treating these experiences as sensational revelations. You see films and novels that have sprouted up around the imagery of near-death. Kenneth Ring, one of the more outspoken people sorting through this material suggest that individuals brought back from death by these new technologies are prophets or seers for a new planetary vision. And others including our neighbor, Carl Sagan, has countered that these visions are merely symptoms of the body under stress. I am not picking up this issue to pursue it at length or even to take a side on it, but simply want to point out the way in which, even for us moderns, death imagery has proven to be once again the source of great curiosity and of a kind of ongoing creativity in the artistic response and perhaps in some of the scientific argument.

It seems to me then, quite apart from these examples that post mortem existence, however it is imagined in different cultures, is a thoroughly imaginal existence. That is, it can only be approached by developing and exercising the imagination, and recasting images to suit the changing circumstances of technology, science, economy, or social history. Post mortem existence. That is, it can only be approached by developing and exercising the imagination, and recasting images to suit the changing circumstances of technology, science economy, or social history. Post mortem existence is not only thoroughly imaginal, but it is also ceaselessly questionable, and here I want to show what might be in intrinsic relationship between the human capacity or need to inquire, and the human inevitability of the experience of death. Post mortem existence is ceaselessly questionable, that is of its very nature it can only be approached within the framework of fundamental questioning. For post mortem existence continually generates questions that are never finally and satisfactorily answered. In one form or another, death centered questions are posed in every culture and you could make a list of your own, but a sample of the sorts of questions that seem to recur: why does life end, and these I must say in my studies are answered more mythologically, but I realize that these are questions taken into other sciences than mythology. Why does life end? What is the significance of the final moment of life? Is this intimate nestling of death in life absurd, or is it significant? does death arrive from afar seen as a visiting stranger to life, or are death and life close friends, so to say, to have known each other intimately all along ? Is there something which is contiguous with life and death? The concept of a soul springs to mind, but that carries with it a history that might back us away from the role or function of the notion of the soul. But is there something like a soul, some form of life that death and life share in common? Are life and death in fact related in fruitful ways? Does death, therefore include forms of life?

And the big question and the one I want to focus on here is above all, how can we know any of this? Death continually raises the question of knowledge in a reflexive way. That is, in a redoubled way, not only does the question arise, but the grounds of the question of how we might know seem to arise in the face of questions about death. Only through the distinctively human labor of imagination to the

living envision life after death and the mythic geographies of death. Poking through the breakpoint of death, into the other world is an act that orients the human being in this world and brings him to full power the imagination of the living, and enables human labor to take new account of material existence. And I should say that making sudden judgment about the nature of the other world needn't be what we would call a religious judgment, to be still an orienting judgment. It seems to me should a person make a quite secular or let us say agnostic, or anti-religious judgment, this is still a fundamental orientation toward the goals, the purposes and nature of life. So death, whether it be fleshed out in all its full religious imagery, or whether it be agnostic ally sealed as a realm that is impenetrable. Either set of answers generates motives and images which furnish foundations for knowledge and for critical thinking. Because endings are intrinsically prohibitive, this breakthrough at death is also the greatest test of the value of the imagination. That is, if death calls the imagination into being, let's say, it must also be said that death calls the imagination into question, but in facing death, the symbolical capacity of human beings and the symbolic nature of the human species of knowing and understanding are put to the final, the ultimate test of value, that is, that is why in cultural accounts of the origins of death, it seems to me, death so often arises in these myths in the context of a trial, resulting from some failure to pass a test or to endure an ordeal. It seems to me there is a reflexive binding together the notion of test, the functioning of the imagination, and the very value of symbolic and imaginal life in the first place.

All of them are put on trial in confrontation with conceptualization of death. It is the imaginative basis of human creativity that itself put on trial when the cultural judgments concerning the nature and value of death also render a judgment concerning the value of symbolic expression. Is death the final undoing, or is it the ultimate triumph of imaginative capacities?

Whether this is answerable or not, the question about death must be pursued for the inquiry seems constitutive of human nature and culture as we know them. The process mobilized in imagining death becomes the template for imagining other realities as well, and this will be the burden of most of the presentation, in fact. Humanity appears to be that species that reflects on its own significance, arguably one distinctive mark of the species is its capacity of reflect about the capacity to be reflective.

As a mortal being then, what is the meaning of mortality? By exploring the outer limits of their existence and of their certainty, humans set themselves patterns of inquiring and reflection in regard to other matters. In the very act of contemplating their own ending in death, and in grappling with their own purpose and significance, in light of that end, humans explore and extend the margins of human knowledge in all the realms with which they are in contact and here, without being a person immersed in science and technology, what I would like to suggest perhaps for conversation, what I'm inquiring about myself, is if this holds true also for our other fields of knowledge and inquiry, which we would put under the headings of technology and science. Let me show how this might be the case in some cultural traditions, and the comparative study of religions offers us a lot of ground for facing these kinds of questions, for facing death. Within religious traditions images of death are treated overtly, in a sustained and self conscious manner, and so I think that comparative religion lends itself to the examination of this kind of question in a particularly interesting way. Religious art and action are often extended interpretive commentaries on the nature of death. I recently put together two volumes that examined the beliefs and practices associated with death in the major world religions, Christianity, Buddhism, Judaism, Hinduism, Islam, and you could draw on those cases for material.

What I'd like to do, given 1992 and my own interest in South American Indian material, is to observe this anniversary of the landfall of Columbus in the New World by drawing on native South American religious traditions, with whom Columbus and other conquistadors came in contact. I also choose them because in many senses, the relevance of these strains of thinking, mythological, and let us say, strains that had not long ago been dubbed primitive ways of thinking, the connection between those patterns of thought and our own is often a bridge that is hard to build, so I would like to use that material as germane to a sophisticated conversation which might be relevant to us.

This summer, the twenty-fourth volume of a set of books on South American religious lore will appear. This has been built up over the past two decades by Johannes Wilbert of UCLA. It involves six hundred native informants, as the term goes, narrating the most important stories and traditions of their cultural heritage. There are fifteen hundred different language groups, arguably about that number of different tribes in South America, and this is the first complete compendium. And in fact, it's probably the most complete corpus of mythology we have for any continent, especially since it's divided and analyzed by scientific motif indexing systems that let us cut through the narratives in lots of different ways with the assistance of computers.

This source material indicates that there are several deaths that act as gathering points for reflection, and that punctuate the rhythm of South American religious life. These deaths become the basis for fundamental processes of imagination, indeed, taken as a set, they constitute the framework of cosmic and individual existence, whose structures and outward forms result from deaths from one sort or another and in the index motif you can see that deaths of one kind or another are the predominant obsessions or preoccupations of South American Indian mythology.

I pulled out what I think are six gathering points, six deaths, under which most others could be set, so six headings, and I would list them as this way, in, as I say, in what looked to be the order of their appearance. There is a kind of temporal structure built into them. There is the death of the primordial universe, sometimes several times over; there are several universes which pre-exist this one in which the human beings live. For my sake I use the term primordial universe for those which have disappeared, and I use the term cosmos to refer to that world in which human beings live.

The second umbrella category of death inhabited those primordial worlds. Trees, especially a central world tree, certain key stars in the constellations of the heavens, these are featured and they are often given on the mythic stage their own moment and episode to die in rather dramatic form quite apart from the fact that the whole epoch, the whole universe will come to a crashing end, they enjoy their moment of glory, and the imagery of their demise ends up to be, I would argue, very important in the critical patterns of thought in society.

The third grouping of death is the death of the first human being. This appears outside of the mythic world and marks the beginning of life in this cosmos that human beings inhabit.

The fourth, the initiatory death that is undergone by human individuals during their rites of passage as they pass through certainly initiation and puberty, death imagery comes to the fore, but in many other rites of passage, immersion in water or subjugation to passing through fire, there are other references to death that effect the rite of passage.

The fifth grouping of deaths is the ritual response to bodily death, what we probably in most common parlance refer to as death, when someone is dead, people bury him or her, or they burn her or they drown the body, or whatever it will, there is a ritual response to the demise of the human individual body and that unleashes all kinds of imagery.

The sixth set is the death of the cosmos inhabited by human beings. So not only do the primordial universes fold, but this cosmos is generally seen to have a terminal point as well, which is imagined in exorbitant detail. I am going to skip the latter three, somewhat perversely, since speak about funerals, and there accompanying imagery, and I won't speak about the eschatological demise of this cosmos.

What I would like to do instead is speak about the first three types of death, because I think they are very fundamental and they are often not spoke of, at least in my field, in connection with the fundamental processes of knowing. First of all, the death of the primordial universe.

Nearly all South American creation scenarios begin with the death of a prior universe, in fact, not much can be said about the earlier world, but its death. And this demise of the earlier world becomes a source of fascination and abundant mythology. Within a single community, however, there are lots of varieties of how that world came to an end: cosmic flood, fire, drought, earthquake, putrefaction, petrification.

These first creations suffered somehow a total disaster and it seems in my rendering of the multiplicity of accounts, that no account describes it satisfactorily and adequately, and so there are multiple accounts. I say this because I resist in my field, the temptation to try to ferret out one account as the orthodox, canonical account and the rest as somehow also-rans, or later accretions that are specious. They all seem to me valuable and they all seem to me a symptom of the difficulty to satisfactorily describe that end.

The drama of the flood often results in the death of an aquatic monster and its dismemberment, and divisibility of that water dragon or monster assures the discreteness, the divisibility of subsequent forms in the universe, something that seems to me a predicate, or a foundation for analysis, the ability to divide and measure, to make discrete judgments, to separate one entity or one form of existence from another. This can be seen in the creation cycle of the Makiritare Indians of the Orinoco River in Venezuela. Nadeiumadi, an earthly aspect of the Makiritare creator, had brought a stone egg, called Huehanna, from Heaven. Huehanna refers to a flower which is also a drink, in fact, from the Iowasca vine, it's active chemical is Bon__, which allows for hallucinations. So Huehanna, which etymologically refers to, I'd better not get into the strings of associations, I can see I'd never get through, but, just to say it here, this is the kind of thing I'm speaking about that these associations and images radiate out into both practical and epistemological life of human beings in these cultures. Anyway, if it were contained all the invisible sounds of future life forms and species. Since the conditions for life were judged not propitious yet, he hid the stone egg on the heavenly mountain. Nuna, who was the male cannibalistic moon stole Huehanna, with the intention of eating its contents, the potential life of the world. In order to save the beings who existed as invisible sounds that were contained in it, Nuna's sister, Frimene, hid the stone egg in her vagina. During the night her brother stole into the place where she was lying and forcing her legs apart, thrust his hand into her vagina in search of the stone egg full of sounds. Frimene escaped from her cannibalistic and somewhat incestuous brother by turning into Huiio, who is the mistress of water, and the anaconda rainbow-serpent.

The future multi-form life of the universe seemed to have fallen into an inextricable quandary at this point. The invisible sounds of people and indeed of all entities were encased in an impenetrable and non-growing timeless stone egg, which had now been enveloped in chaos, the body of Huiio, a watery, formless being.

The solution was found in Huiio's death, when she appeared in the sky as a rainbow a numberless horde of hunters shot arrows into her. After she fell, each being ate a mouthful of her flesh and washed in the river o her blood.

I must say that washing in the blood accounts for the biodiversity of species marking, if you will, and also allows for people to make taxonomic renderings of the biological diversity in their ecotype.

A flood now indendates the entire earth. At the same time Huehanna fell from Huiio's formless body and crashed on a rock in the river. All the sounds inside of it became creatures of the domain of water,

except for two tiny eggs. These are the twin heroes that survive intact.

The dissoluble nature of the indivisible world was overcome by penetration, by brokenness, by dismembers, by death and separation.

Each one of these processes allows one mode of being, for example, the period, the trespass on another, for example, the eternal, for the stone egg, and thereby to extract specific multiforms of the ecotope from formlessness, which I'm arguing is both conceptual and in their view, characteristic of the primordial world. Their violent collision established precedent-setting distances and boundaries between different kinds of being. The result of this niff (?) which would really take, well it takes the Makiritares to their lifetime to unpack this as they grow in wisdom, and see the, if I can use the word loosely here, scientific applications of these fundamental principles, but some of the results are the diverse habitats and languages of separate species of animals, as well as the separate habitats and customs of the separate linguistic groups of human beings who make different sounds. The distinct worlds of the moon, and the rainbow, they are able to track, for example, the differences between rainbows in one solstitial period or another because of the angle at which the sun cuts across the rains which are carried by differing prevailing winds, depending on the thermal winds that are generated again by the shifting of the sun. In any case all of these are remarked upon, using the imagery from this death.

The discrimination also of all other carnal relations, from those that are restricted by the incest taboo, so it allows for discrimination. The flood or fire which destroys the first world leaves the subsequent cosmos scarred with signs of its passing. The world exhibits clear signs of catastrophe then. The significant orders of the new world render it intelligible, measurable, susceptible to human knowledge, and exploitation they make, let us say science and the discrimination among human values, possible. The burned and broken fragments of those first devastations mark the orders of the geographic landscape of calendrical time, of animal taxonomy and social hierarchy. The death of the first universe left indelible marks in the form of specific odors which allow for classification of animals, and even of festivals to tell you the truth, of different smells, of different shapes, colors, tastes, sizes, sounds, textures, and so on. With infinity thus factored and splintered into apprehensible units, life in the world is rendered intelligible.

Though the significant orders of the cosmos may be divided into the staggered death that now constitute the food chain and the cycles of prey and the rhythms of war, and the calendars of ritual sacrifice. All the significant orders are seen to cohere because they arise from the same universal catastrophe.

I'm trying to get at the fact that the world is not therefore just splintered into irrelevant parallel universes, but since all these taxonomic orders emerge from a single catastrophe, the death of the universe, they are in some dialectical way seen also to be related to one another and to cohere as a whole.

Let me do away with the why-why reference and move to the second kind of death. The deaths of individual primordial beings. Primordial beings who inhabited that first universe also die and meet their death, they do so in myriad ways. Just a short list: they are burned, they are sometimes transfixed to the ground to mark the cardinal points, they are fractured, they get crushed, they become dismembered, they are sometimes frightened to death, which is one instance I'll mention at a little length. They are left to rot or they are turned to stone.

In one way or another then, these primordial beings become hidden in their full manifestation anyway, they become partial, or periodic in their appearances, whereas before they were full in their manifestations. Now they appear from time to time or only in part, an arm or a leg in one constellation

or another. Sacrifices of this sort help one to imagine the conquering of chaos, the conquering of infinity and the conquering of distinctness.

By penetrating these primordial bodies, by breaking their bones, slicing their flesh, lugging the guts from the center to the periphery of the primordial world, sacrificial acts of death break of the homogeneity of primordial space.

Deaths of this sort cause some places to stand out above others as remarkable for difference and change and here the sacredness of mountains and certain species of trees and so on become accounted for.

These new signs of death then, condition the trying to walk and forth between general statements of this kind and instantiations ?? which are anchored in one community or another.

I'm not sure which of the two seem more bizarre in a presentation liked this, the abstract statement of principles, or the mythology which you may not visit from day to day.

Some primordial beings meet their deaths through petrification into stone. They are turned to stone when they run from the limitless menace of unbroken light or noise, or obliterating flood, or from limitless veracity of someone who is trying to eat them, or perverse sex if someone is trying to do them. The nature and destiny of the first world becomes crystallized in the lot of this first community, which scatters during some fearful flight. Spread across the face of the universe, these petrified primordials now stand stony and silent in various marked places of the world, such as the rocks at the center of the earth, the boulders with glyphs that stand at important river rapids and which account for the spawning grounds of fish, the cliffs on the margins of known space, or even the constellations of the starry night. Like a fast action photo showing the concentric waves that are produced by a raindrop on water, the current locations of petrified primordial's allow one to see lines of force in the helter skelter and to discern they became frozen with fear.

As an example here, the nawpa, which are a class of mythical beings in the Andes, and this cuts across Andean history for at least the 500 years we have record in different language communities and in different mythologies.

The nawpa are supernatural beings of that primordial age of ancient Andean mythology. They become motion set in stone. The nawpa existed in a primordial universe which was totally, infinitely dark. They make a point to say that it is not the darkness that we experience at night, which is only a fragment of that darkness, it is the infinite darkness.

All of the nawpa existed in what one now must refer to as the center of the universe.

In retrospect we can see that, at the time they couldn't see anything, quite literally.

But it was in fact a center of infinite density, there was nothing but the center, it was all that appeared to be. For some inexplicable reason and in fact one of the problems that is inexplicable is that there are many explanations that contradict one other. For some inexplicable reason the light began to rise on the first day in the universe.

The spontaneous appearance of light frightened these center. In the course of their flight they became frozen with fear and were petrified into stone at one place or another in their flight. These are the stones that mark the significant boundaries of space in the Andes. Huacas, they are called. These are petrified divine beings who are now holy sites, and they dot Andes landscape, the rocks then are memorials to the last fully manifest act, the last fleeting moment of the primordium. And for that reason, they forever evoke fear and awe, they are that ultimate experience of primordial being, as it met its death.

I'm aware that I speak one week after NASA has announced the findings of it 400 million dollar cosmic background explorer satellite project.

For that reason, somewhat nervously I must say, in this company, I allow myself at least a one paragraph comment on this potentially extraordinary report concerning the destruction of our primordial universe and its relation to human knowledge in our world.

The Colby project used differential microwave radiometers (DMRs) to measure the ripples born in the explosion of our primordial universe fifteen billion years ago. At that time, that is, in the ten to the negative 43rd second of time after the big bang, the entire universe may have moved from a condition so infinitely dense and small that there was not room enough for one single proton to the size of a galaxy.

In that first fraction of a nanosecond in which the cosmic egg, as it's referred to in the report, was destroyed, we may discern the elemental lines of force that structure our universe, the shape, the direction, and the history of those rippling forces, may now be assessed. Assessed in terms of its residual imagery, that is the imprints that are left on the fabric of our universes, or I would say in my own terms, our cosmoses, space time by that primordial explosion, imprints left in the form of infinitesimal micro variations in temperature, which can still be perceived, however, as the soft afterglow of that primordial explosion, which pours now over the earth some fifteen billion years later.

Even though this afterglow is now spread so thin that it is in the range of temperature of 454 degrees Fahrenheit below zero. Tiny, I gather, this was the achievement of the DMRs, tiny one hundred thousandth of a degree temperature variations can be read and seen as evidence that the small ripples evident in that initial nanosecond have grown into galaxies, clusters of pattern of their movements and relations is the same pattern image then established in the instant of the death of the primordial world egg now enlarged over time.

As an historian of religions, who studies comparative mythologies of creation, I cannot help but avoid seeing in Dr. George Smoot's report on the Colby project, the strategies of the human imagination at work in evaluation existence within the ultimate structures of time and space. Of course contemporary technology has provided new data and created in fact a new context for human imagining, including new standards of observation and evidence.

But the mythic pattern of thought, the perceptual structure of the imagination, that is, one aspect of which I'm arguing is the relationship of images of death to the structure of the universe, remains strikingly recognizable whether they be in the Andes of South America, or in the Lawrence Berkeley Laboratory.

In the case of the Inca people, and here the handout suddenly become germane, you might look at this side of the handout first, which is a map of the city of Cuzco, the ancient capital of the Inca empire. There are a number of lines radiating out from the center which is the Codiconcha, the temple of the sun.

The lines radiate out in just as straight a line as you see here, in the Inca empire and on these lines are placed the huacas that I referred to, the stones who are ancestors who became petrified in the instant of demise of their universe.

The lines became used in different ceremonies as processional routes for sacrificial victims in particular, so once again, a kind of death aura in the organization of space and time. There is too much to go into there, so I'll stick with my text.

In the case of the Inca people, who thrived as an empire in the Andes at the time of contact in the 16th century, the orientation of the separate huacas, there were 408 or them, and as I say, if you wanted to

you could draw the dots on these different lines and the dots which allow for one to draw the lines, and to extrapolate where the center was. In the case of these people, the orientation of the separate huacas, the direction of their movements as they spread outward from the center, and their precise location within one or another of the four quarters of the universe, revealed aspects of the impelling force at the center from which they came. The point of origin inferred from their relative positions and the myths that described how they arrived at these places marked a center of time and space.

The most important center being the temple of the sun in the capital city of Cuzco, and you can see it marked with the number 1 on your map, in the center of the urban space. I should point out that the walls of the city also outline the body of an animal which is the primary sacrificial animal in the solstitial festival, so there is a kind of enfolding of these images, one on the other, and a reincorporation, quite literally, in the imagery in the structures of the city.

The fate of this primordial community of huacas epitomizes the lot of the first age, that is, what was once unique has now suffered division.

The pell mell scattering of the first community generates the ordered division of species, the multiple units of carnal and astronomical time, which measure off abundant life, the time of gestation, the time of menses, all of these are mentioned in these myths of division of time.

Because of their associations with the creative powers at the beginning, the dispersed sacred sights of the huacas serve now as regenerative centers of their own, each one a kind of center for a local community.

Each local community has its myth of the origin and death of that ancestor who was named, and from whom they descend as lineages.

By crystallizing, you see then, that the sites serve as regenerative centers of life for various kinds of time, solar, lunar, sidereal.

If you turn the page over you will see a diagram like this, which can only at this point be suggested, since there wouldn't be time to go into detail, but here you see numerical ordering of the different secce, on each secce then are a specific number of huacas, each huaca has a corresponding element in the sky, so that you have mapped on the terrestrial landscape a kind of calculus of cyderial time, and Ryda Zutama has shown how the different secce, if you group them together in major and minor groups, which the Inca did, you can calculate time over various periods, different venucian cycles, over synodical periods, over anonymous cyderial years, certainly lunar and solar calendars, and all of their various combinations and conjunctions.

These are played out not only as abstractions in the sky, but they are played out as let us say, behavioral edicts for the social groups that belong to the specific locations with a death-centered stone in their midst.

The imagery of death that each community kept in it's origin myth, and the imagery of death in the overall Inca accounts of the shape of their kingdom ends up crating a set of ciphers that links individual life and patterns of knowing to the largest structures of the cosmos.

By originating the conditions of intelligibility, the primordial experience of deathly fear which is a stony form of sacrifice becomes the beginning of wisdom.

Let me just summarize the third point, the death of the first human being. The death of the first human being becomes paradigmatic for how human beings will be treated and for the kind of mortality that human beings suffer as opposed to the mortality of preceding cosmoses.

So there is a great deal of attention in mythology paid to the first human being that dies. It is significant for me that the beginnings of human life are always marked with the death of a certain kind.

That is human beings are seen to be mortal by character, by nature, from the very beginning, for example one set of myths of origins of human beings shows that in the beginning they existed in an

underground and they never die.

But things became overcrowded so they found they had to come up into this level of the world.

As they were emerging through the hole that led from the underground to this world, someone, a pregnant woman in fact, got stuck and died. Her child was born into this world, and so entrance into this world or the first appearance of human life into this world is marked with death.

One of the most striking for me is the Makiritare Indians, whom I've mentioned earlier; who say that death exists in human beings in the same way that fire is contained in the wood of the two trees that are used to make the wood drill for fire.

That is, there is the notion that these wood drill trees are thoroughly filled with fire, even before they ever are consumed by flame.

Fire assumes the form and meaning it has now in conjunction with wood's consumable being. That is death assumes new form and significance with human mortals within them and their world.

The tree and the human are thoroughly dead, but the death appears in the final moment of the bodily extinction of both human being and wood. The Rurwall of Venezuela also have a notion, they describe all the various stages of human growth, in terms of the verb wa, or wa-wa. They gave no word for life, let us say, rather life is a set of cognate words showing different degrees of death, of wa. And wa is in fact the vagina of the goddess Dawaronie who is the goddess of the forest, of a specific tree, the maroche palm tree, in fact.

And the reason that her womb is described as wa is because it is in the shape of a canoe, which is the canoe which takes one on the journey through life, and has different emblematic, symbolic appearances in the form of the womb, and finally in the form of the dug-out canoe coffin in which one is buried and sort of pushed off into the next world.

Let me just bring myself to a conclusion then, for those of you who are still slogging to the text. The central message is that human beings can be born and grow because they are mortal, because they are transitory. In this light, it is not so surprising that the Waiwai call a prepubescent child an okopuchi, a word that means "little corpse".

Modeled on the actions of the first human being, ceremonial operations frequently instigate growth by imposing an experience of ritual death. In some cases the initiatory death consists of an ecstatic swoon, or in being treated like a corpse, being buried for example, in the course of initiation. In others, the body is subjected to the rigors of an ordeal and a symbolic dismemberment. The constant interruption of death, the way in which death interrupts life takes on symbolic form of cutting the body, of perforating it, piercing ears, and so on, of those people who continued to grow, and need therefore to continually die in some measure.

In all cases, images of death permit human existence to become critical, that is, the imagery of ritual death allows initiates to experience and locate the reality of the crises that makes their symbolic existence an initiatory condition, one that is characterized by constant change.

In this world, as is evident in the food chain, and in the cycles of prey, life is sustained and replenished by death, and it's my contention in this paper, that symbolic life in this world, including the symbols that we use to think with in our sciences, symbolic life is no exception to this notion of using death to replenish itself.

The symbolic world, in which human knowledge and the imagination thrive, exists not on its own but only as a shadow world of reflections and refractions of those entities being considered. The symbolic world exists only in reference to realities that are no longer fully present, but somehow are scored by absence or death, the signs of those scorings that we use to think with, and imagine with.

In the view of South American mythologies, and perhaps in religious views generally, the awareness

of death, an awareness spelled out only in specific integrating images located within one specific culture. The awareness of death accounts for the structural process of the imagination, which grounds knowledge, memory, and art.

Human beings are the mortals, not because they are the only creatures to die, but because they enfold death into their lives in self-conscious ways.

They face death, and they reflect on the images that they see, bending their lives to conform to the images of death and reshaping their worlds with the after-images emanating from death in its several different manifestations.

Such reflections make systematic knowledge possible, indeed in South American mythologies, the universe is knowable, precisely because it begins with a deadly episode. Just as the self-conscious life of human knowledge borne an image, begins with death.

Just a final suggestion, what I'm suggesting is that the imagination is, if I can use this term, the imagination is substantial with death, whatever death is, we would probably have to say that also the imagination is. Death is made up of the same substance as the imagination, both are spectral, they are spectral processes that make speculation, whether that speculation be in science, or technology or in human value, make speculation possible.

Like death, the imagination is that process or condition in which images are born; images arise in the relative absence of that which they represent, they are spectral in this sense and that is why death becomes so deeply implicated I suggest, or I'm wondering myself, but for the sake of conversation would propose. This is why death becomes so deeply implicated in the origins of the imagination which in itself drives forward developments on the cutting edge, perhaps here an image from death as well, on the cutting edge of science, technology and human values. Thanks a lot.