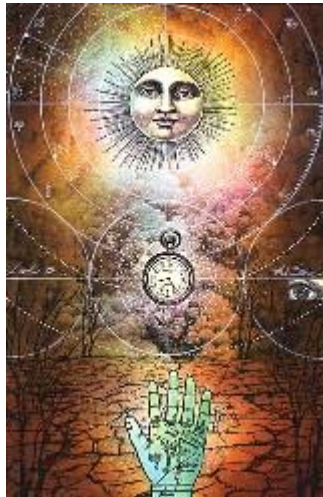
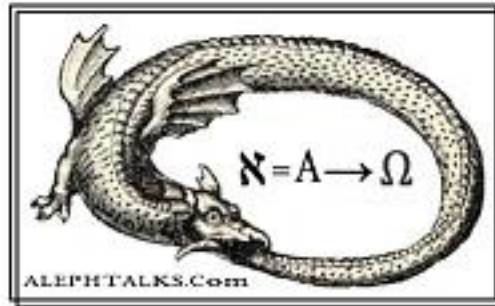


Is Mysticism Where Science, Art and Religion Meet?



First Lecture Subject Foundations

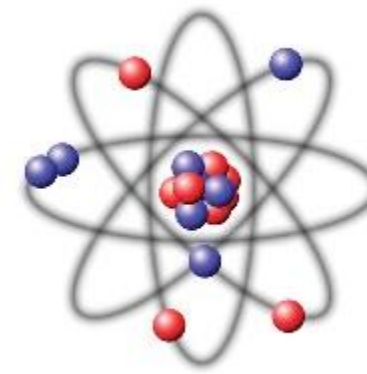


Overview



- What is the problem we deal with here: is mysticism where science, art, and religion meet?
- How do we compare statements by scientists and mystics?
 - Science at a crossroads: cosmology, matter vs dark matter vs dark energy, string theory
 - Science deals with experiments, modeling, and breaks down in verbal interpretation
 - Science language breakdown: how can matter be both a particle and a wave?
 - Mysticism deals with concepts that cannot be expressed verbally, that are beyond language
- The scale of the universe encompasses tens of orders of magnitude: quantum space compartments to intergalactic spaces

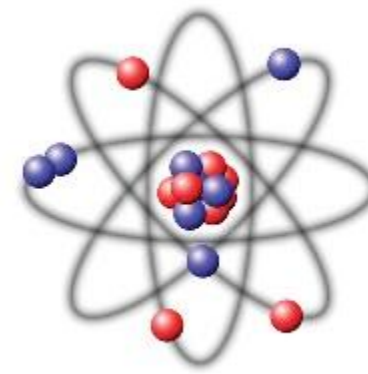
The Scale of the Universe



• Matter in Its Ten Dimensional Subspace

- Space compartments holds subquarks or electrons
- Subquarks make up matter quarks
- Quarks make up matter protons and matter neutrons
- Protons and neutrons make up nuclei in matter atoms
- Electrons, protons and neutrons make up matter atoms
- $1.33 \cdot 10^{50}$ atoms comprise the earth $\Rightarrow 5.972 \cdot 10^{24}$ kg
- $1.989 \cdot 10^{30}$ kg equals the mass of the sun
- 10^8 stars in a typical galaxy
- 10^8 galaxies in the universe


















The Scale of the Universe

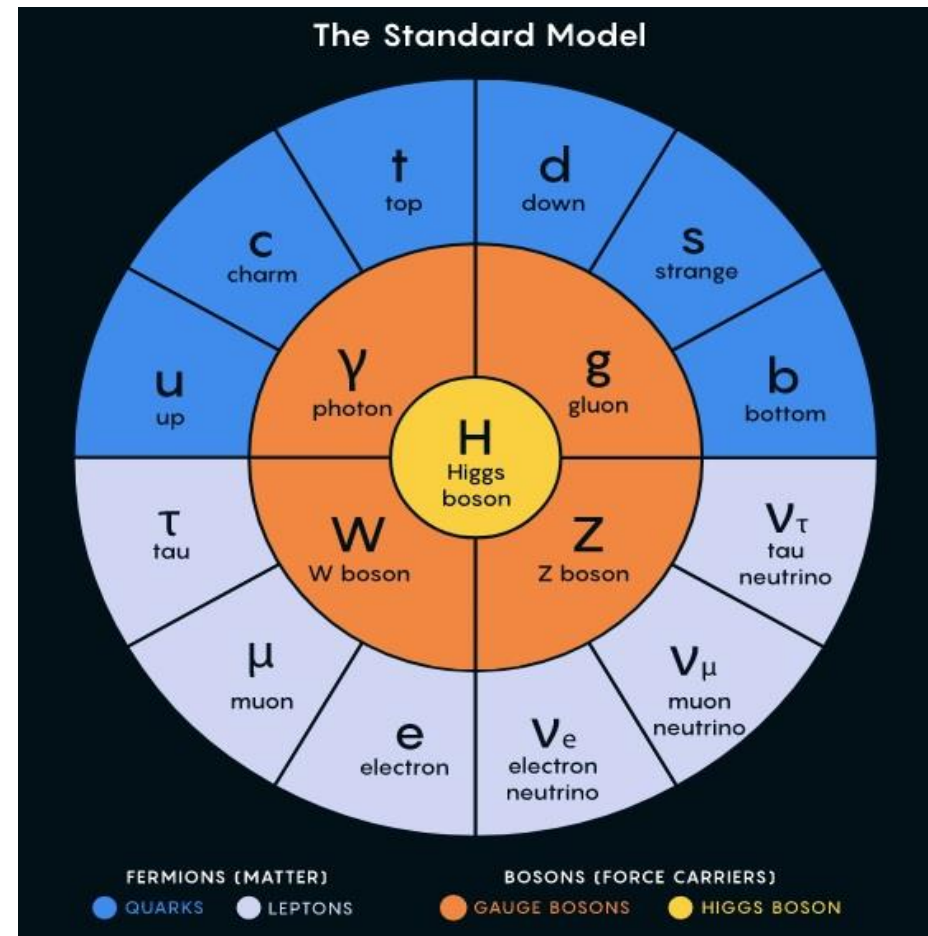


- **Dark Matter in Its Ten Dimensional !**
 - Space compartments contain subquarks
 - Subquarks bind to one another, either active (close to thermal energy source) or quiescent
 - Quiescent dark matter quarks form tubes hundreds of kilometers long in space
 - Active aggregations of subquarks form sentient beings on planets and stars

The Standard Model of Particle Physics

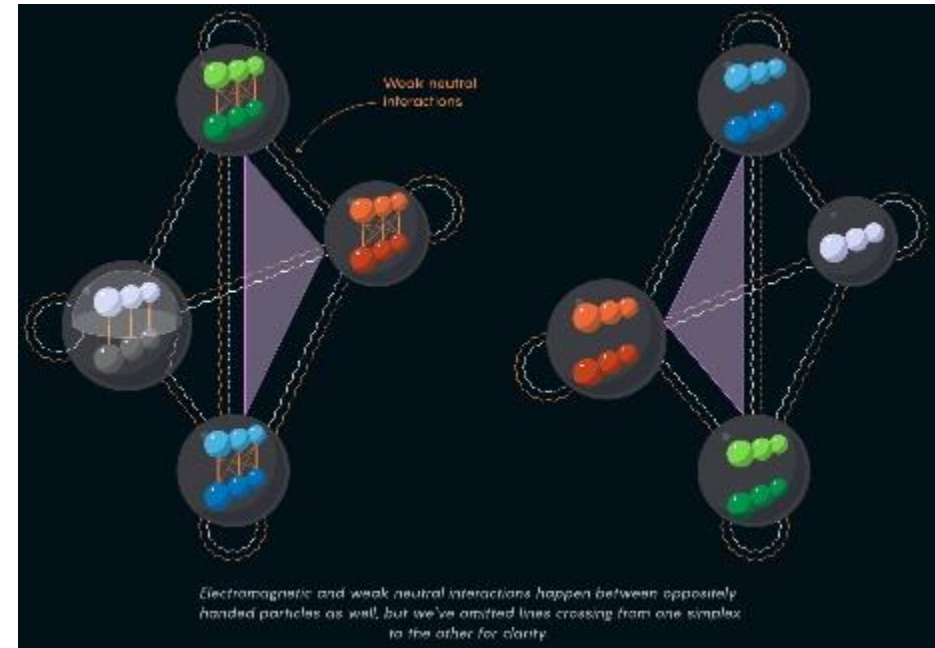
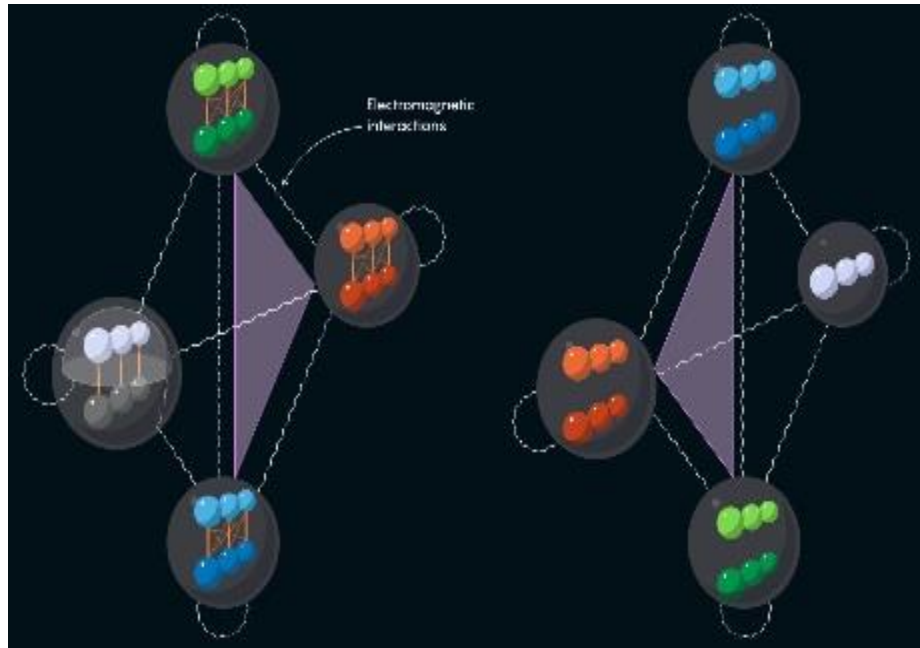
The Standard Model

THREE GENERATIONS OF MATTER (FERMIONS)			INTERACTIONS/FORCE CARRIERS (BOSONS)		
QUARKS	Mass: 2.2* Charge: 2/3 Spin: 1/2  Up	1,270 2/3 1/2  Charm	173,100 2/3 1/2  Top	GAUGE BOSONS (VECTOR BOSONS)	0 0 1  Gluon
	4.7 -1/3 1/2  Down	96 -1/3 1/2  Strange	4,180 -1/3 1/2  Bottom		0 0 1  Photon
	0.511 -1 1/2  Electron	105.66 -1 1/2  Muon	1,776.8 -1 1/2  Tau		91,188 0 1  Z boson
LEPTONS	<0.00000012 0 1/2  Electron neutrino	<0.00000012 0 1/2  Muon neutrino	<0.00000012 0 1/2  Tau neutrino	SCALAR BOSONS	125,180 0 0  Higgs boson
	80,379 +/-1 1  W boson	* All masses are given in MeV/c ²			



Standard Model of Physics

<https://sketchfab.com/3d-models/the-standard-model-of-particle-physics-95f060e8f9a845ddb5a9cf0441f4978a>



Where Are We Going: A Picture



MATTER

DARK MATTER

Space Time 4 Dimensions	Space Time 4 Dimensions
Calabi Yau Manifold 6 Compactified Dimensions 3 Holes Hodge Diamond (9,11,6,7)	Calabi Yau Manifold 6 Compactified Dimension 4 Holes Hodge Diamond (17,12,21,12)
Calabi Yau Manifold 6 Compactified Dimensions 8 Holes Hodge Diamond (8,23,21,17)	

Many Dimensions!



Three dimensions for space and one for time is NOT enough

In 1919 Kaluza wrote Einstein showing how a five dimensional space

Could encompass both gravity and electromagnetism

In 1926 Oskar Klein suggested the fifth dimension might be compactified

This theory did not survive observable data

Twenty six dimensions might suffice but is incomprehensible:

-Suppose the dimensions are folded up on one another,

So we can have $26!$ foldings or 10^{27} possible foldings!!!

With a six dimensional space we have $6!=720$ possible foldings!!

How in the world does this simplify anything?

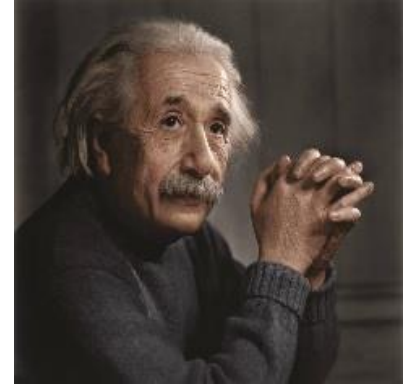
One possibility is that when a space compartment is examined

The walls of the space compartment abut onto a six dimensional subspace

Or even an eighteen dimensional subspace, so the dimensions are not

Compactified but rather are walled off by subspace information walls

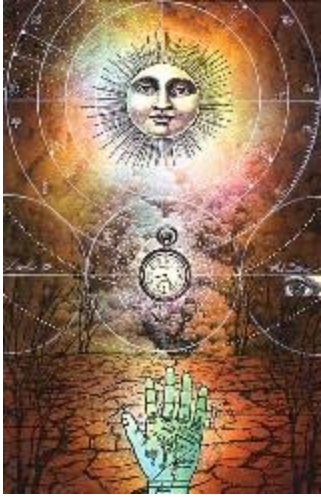
Albert Einstein on Science and Epistemology



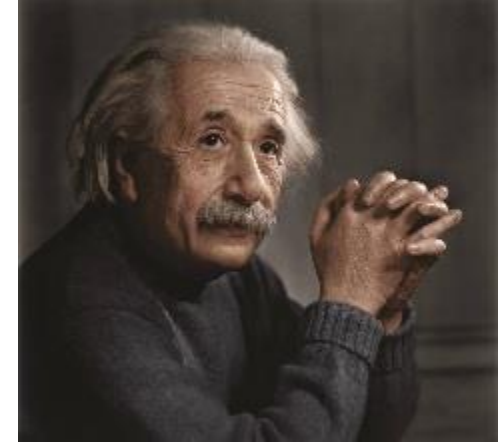
- Epistemology: the theory of knowledge, especially with regard to its methods, validity, and scope. Epistemology is the investigation of what distinguishes justified belief from opinion.
- Science without epistemology is-in so far as it is thinkable at all-primitive and muddled
- The scientist must appear to be the systematic epistemologist
 - A realist in describing a world independent of the acts of perception
 - An idealist looking upon concepts and theories as the free inventions of human spirit (not logically derivable from what is empirically given)
 - A positivist in so far as his concepts and theories are justified only to the extent of logical representation of relations among sensory experiences
 - A Platonist or Pythagorean in so far as he considers the viewpoint of logical simplicity an effective and indispensable tool

What Is the Problem?

- What kind of knowledge are we talking about
- What kind of statement are we going to compare?
- The human mind is capable of two kinds of knowledge, or two modes of consciousness
 - the rational and
 - the intuitive

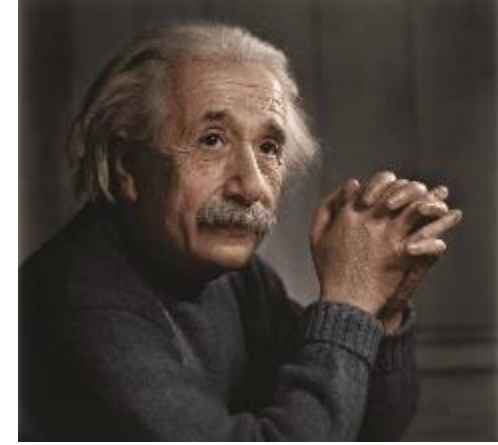


Rational Knowledge



- Rational knowledge derives from the experience we have with objects and events in our everyday life.
- It belongs to the realm of intellect whose function is to discriminate, divide, compare, measure and categorize
- This creates a world of intellectual distinctions:
 - opposites which can only exist in relation to each other
 - Buddhists call this type of knowledge relative.

Rational Knowledge



Abstraction is a critical feature of this knowledge

We want to compare and to classify the immense variety of shapes, structures, and phenomena in the world

We are forced to select only a few significant ones. Thus, we construct an intellectual map of reality in which things are reduced to their general outlines.

In most languages, this structure is made explicit by the use of alphabets which communicate experience and thought in long lines of letters.

Intuitive Knowledge

- The natural world, on the other hand, is one of infinite varieties and complexities, a multidimensional world
 - no straight lines or completely regular shapes, which do not happen in sequences, but all together;
 - a world where even empty space has amazing structure
 - we are faced with the same kind of problem as the cartographer who tries to convert the curved face of the Earth with a sequence of plane maps
 - Werner Heisenberg: every word or concept, clear as it may seem to be, has only a limited range of applicability.
- Because our representation of reality, the NOW that we experience, we tend to confuse the reality with its abstraction



Intuitive Knowledge



- It is one of the main aims of Eastern mysticism to rid us of this confusion.
 - Zen Buddhists say that a finger is needed to point at the moon, but that we should not trouble ourselves with the finger once the moon is recognized.
 - The Taoist sage Chuang Tzu wrote
 - Fishing baskets are employed to catch fish, but when the fish are caught, the men forget the baskets; snares are employed to catch hares, but when the hares are caught, men forget the snares.
 - Words are employed to convey ideas but when the ideas are grasped, men forget the words.
- The semanticist Alfred Korzybski made exactly the same point with his slogan: **The map is not the territory.**

Intuitive Knowledge



What Eastern mysticism is concerned with is a direct experience of reality which transcends not only intellectual thinking but also sensory perception.

What is soundless, touchless, formless, imperishable

Likewise tasteless, constant, odorless,

Without beginning, without end, higher than the great stable

By discerning That, one is liberated from the mouth of death

Intuitive Knowledge



- Knowledge which comes from such an experience is called **absolute knowledge** by Buddhists because it does not rely on the discriminations, abstractions and classifications of the intellect which we have seen are always relative and approximate
- The Buddha calls this the direct experience of undifferentiated, undivided, indeterminate such-ness.
- Complete apprehension of this such-ness is not only the core of Eastern mysticism, but is the central characteristic of all mystical experience.
- The Eastern mystics repeatedly insist on the fact that the ultimate reality can never be an object of reasoning or of demonstrable knowledge. It can never be adequately described by words, because it lies beyond the realms of the senses and of the intellect from which are words and concepts are derived

There the eye goes not,

Speech goes not, nor the mind.

We know not, we understand not

How one would teach it

10/28/2020

Intuitive Knowledge



- Lao Tzu who calls this reality the Tao, states the same in the opening line of the Tao Te Ching:
 - **The Tao that can be expressed is not the eternal Tao.**
 - As Chuang Tzu said: **if it could be talked about, everybody would have told their brother.**
- Absolute knowledge is thus an entirely non-intellectual experience of reality, an experience arising in a non-ordinary state of consciousness which may be called a **meditative or mystical state**.
- That such a state exists has not only been testified by many so called mystics in the East and in the West (including Native American shaman, African shaman), but is also indicated by psychological research.
- William James writes
 - **Our normal waking conscious, rational consciousness as we call it, is but one special type of consciousness whilst all about it, parted from it by the thinness of screens, there lie potential forms of consciousness entirely different**

Physics As Rational and Intuitive Knowledge



- Both types of knowledge, rational knowledge and intuitive knowledge, are found in physics.
- Physics knowledge is gathered in stages:
 - the first stage consists in gathering experimental evidence about the phenomena to be explained.
 - In the second stage, the experimental facts are correlated with mathematical symbols and a mathematical scheme is worked out which interconnects these symbols in a precise and consistent way: such a scheme is usually called mathematical model, or, if it is more comprehensive, a theory.
 - The theory is then used to predict results of further experiments, which are undertaken to check all its implications.

Physics As Rational and Intuitive Knowledge



- At this stage, physicists may be satisfied when they have found a mathematical scheme and know how to use it to predict experiments.
 - But eventually they will want to talk about their results to non-physicists, and therefore have to express them in plain language.
 - Even for the physicists themselves, the formulation of such a verbal mode which constitutes the third stage of research, the interpretation of the results for everyone to see, will be a criterion of the understanding they have reached.

Physics As Rational and Intuitive Knowledge



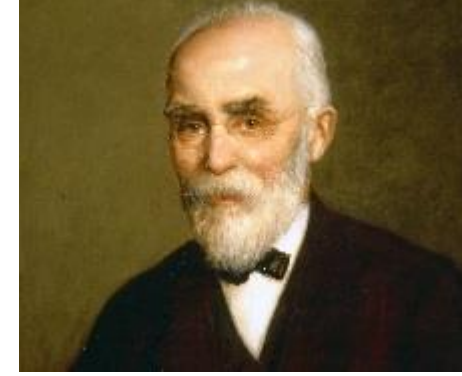
- This way of basing all theories firmly on experiments that all can replicate is known as the scientific method, and it has its counterpart in Eastern philosophy.
- Greek philosophy, on the other hand, was fundamentally different in that respect. The Greeks obtained their models deductively from some fundamental axiom or principle and not inductively from what had been observed. The Greek art of deductive reasoning and logic is an essential ingredient in the second stage of scientific research, the formulation of a consistent mathematical model, and hence is an essential part of science

Physics As Rational and Intuitive Knowledge



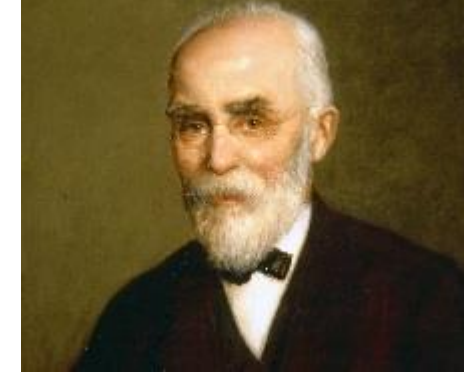
- Rational knowledge and activities certainly constitute the major part of scientific research, but are not all there is to it.
- The rational part of research would, in fact, be useless if it were not complemented by the intuition that gives scientists new insights and makes them creative.
- These insights tend to come suddenly and characteristically not when sitting at a desk working on equations but when relaxing in the bath, during a walk in the woods, on the beach et al. During these periods of relaxation after concentrated intellectual activity, the intuitive mind seems to take over and can produce the sudden clarifying insights which give so much joy and delight to scientific research.

Physics As Rational and Intuitive Knowledge



- Intuitive insights however are of no use to physics unless they can be formulated in a consistent mathematical framework, supplemented by an interpretation in plain language.
- Abstraction is a crucial feature of this framework. It consists, as mentioned before, of a system of concepts and symbols which constitute a map of reality. This map represents only some features of reality; we do not know exactly which these are, since we started compiling our map gradually and without critical analysis in our childhood. The words of our languages are thus not clearly defined. They have several meanings, many of which pass only vaguely through our mind and remain largely in our subconscious when we hear a word.
- **The inaccuracy and ambiguity of our language is essential for poets who work largely with its sub-conscious layers and associations.**

Physics as Rational and Intuitive Knowledge



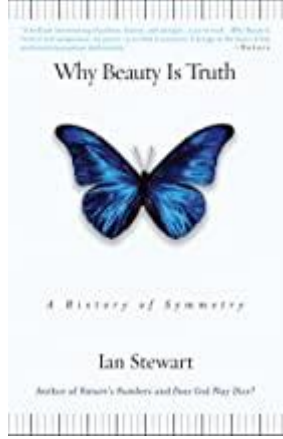
- Science, on the other hand, aims for clear definitions and unambiguous connections, and therefore abstracts language further by limiting the meaning of its words and by standardizing its structure, in accordance with the rules of logic.
- The ultimate abstraction takes place in mathematics where words are replaced by symbols and where the operations of connecting the symbols are rigorously defined.
- The view that mathematics is nothing but an extremely abstract and compressed language does not go unchallenged. Many mathematicians in fact believe that mathematics is not just a language to describe nature, but is inherent in nature itself.
- The originator of this belief was Pythagoras, who made the famous statement **All things are numbers**, and developed a very special kind of mathematical mysticism. Pythagorean philosophy thus introduced logical reasoning into the domain of religion, a development which, according to Bertrand Russell, was decisive for western religious

Mathematics As Rational Knowledge



- The combination of mathematics and theology, which began with Pythagoras, characterized religious philosophy in Greece, in the Middle Ages, and in modern times does to Kant...In Plato, St Augustine, Thomas Aquinas, Descartes, Spinoza and Leibniz
 - an intimate blending of religion and reasoning,
 - of moral aspiration with logical admiration of which is timeless, which comes from Pythagoras, and
 - distinguishes the intellectualized theology of Europe from the more straightforward mysticism of Asia.
- In the Eastern view, mathematics, with its highly differentiated and well defined structure, must be seen as part of our conceptual map, and not as a feature of reality itself. Reality, as experienced by the mystic, is completely indeterminate and undifferentiated.

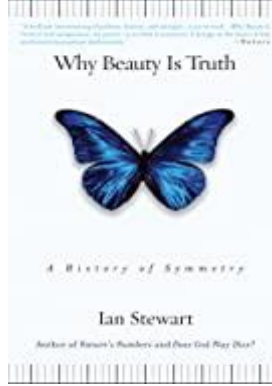
The Unreasonable Effectiveness of Mathematics in the Natural Science



- The enormous usefulness of mathematics in the natural sciences is something bordering on mysterious and there is no rational explanation for this
- This uncanny usefulness of mathematical concepts raises the question of the uniqueness of our physical theories
- We should be grateful for it and hope it will remain valid in future research and that it will extend, for better or for worse, to our pleasure, even though perhaps also to our bafflement, to wide branches of learning
- 1960, Eugene Wigner,
<https://www.dartmouth.edu/~matc/MathDrama/reading/Wigner.html>

Physics and Mathematics

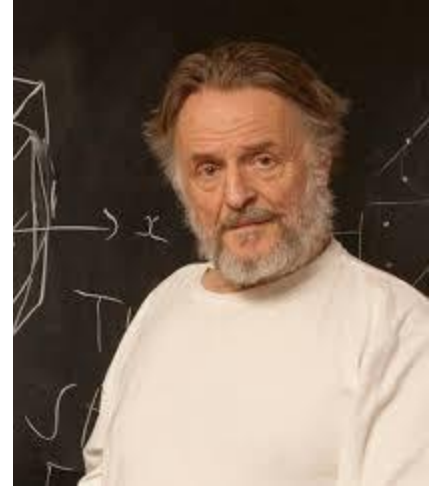
- **Paul Dirac:** Nature's laws have to be both mathematical and beautiful. The mathematician plays a game in which he himself invents the rules, while the physicist plays a game in which the rules are provided by nature, but as time goes on, it becomes increasingly evident that the rules which the mathematician finds interesting are the same as those which nature has chosen.
- **Thomas Huxley:** science is organized common sense, where many a beautiful theory was killed by an ugly fact
- **Albert Einstein:** so many fundamental things are unknown (e.g., the nature of time, the sources of ordered havior of matter, the start and end and shape of the universe) we must remind ourselves how far we are from understanding anything ultimate. To the extent that it is useful, mathematical elegance provides us only local and temporary truths. Still it is our best way forward.
- **Eugene Wigner:** we make a rather narrow selection when choosing the data on which we test our theories. How do we know that, if we made a theory which focuses its attention on phenomena we disregard and disregards some of the phenomena now commanding our attention, that we could not build another theory which has little in common with the present one but which, nevertheless, explains just as many phenomena as the present theory? It has to be admitted that we have no definite evidence that there is no such theory.



Symmetry: The Mathematics of Group Theory

John Conway (inventor of the Game of Life)

Major Contributor to Modern Group Theory



- Mathematicians study properties of symmetry in group theory
- Group Theory and Why I Love
808,017,424,794,512,875,886,459,904,961,710,757,005,754,368,000,000,000—John Conway
- <https://youtube.com/watch?v=mH0oCDa74tE&t=82s>

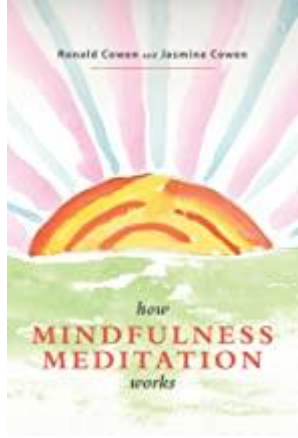
Science vs Mysticism



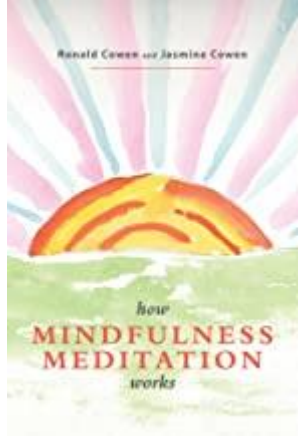
- The scientific method of abstraction is very efficient and powerful, but we have to pay a price for it
 - as we streamline it and make connections more and more rigorous, it becomes increasingly detached from the real world.
 - Using again Korzybski's analogy of the map and the territory, we could say that ordinary language is a map which, due to its intrinsic inaccuracy, has a certain flexibility so it can follow the curved shape of territory to some degree.
 - As we make it more rigorous, this flexibility gradually disappears, and with the language of mathematics we have reached a point where the links with reality are so tenuous that the relation of the symbols to our sensory experience is no longer evident. This is why we have to supplement our mathematical models and theories with verbal interpretations, again using concepts which can be understood intuitively, but are slightly ambiguous.

Western Science Weaknesses

- The nature of scientific paradigms demands extraordinary evidence for extraordinary claims to displace existing paradigms
- its failure to deal adequately with the differences between (1) a scientific fact explained by a paradigm and (2) a knowledgeable belief not explained by a paradigm, dismissed as anecdotal.
- Two open problems that Buddhist psychology deals with
 - The mind-body problem, the causal relationship between mental events and processes and bodily (brain) events and processes; Buddhism says the physical basis of intelligent consciousness is an extremely complex and organically organized shadow matter
 - What should a psychological explanation look like; In Theravadin Buddhism, psychological explanation takes the form of explaining mental and bodily actions

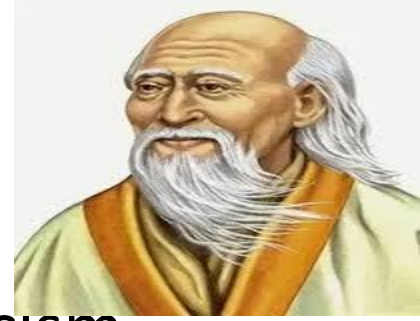


Western Science Weaknesses



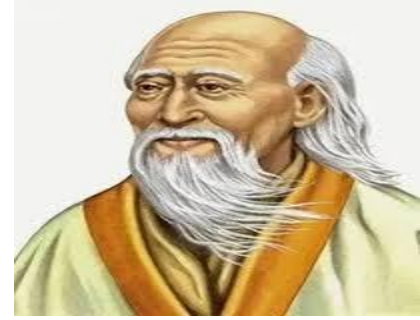
- Western science approach to interpersonal complexity;
- In advanced states of mindfulness meditation, unconscious processes both in others and in oneself become partly conscious, making them accessible to observation with the help of ESP. This suggests that we have an innate capacity to understand others very well.
- Its empirical notion of awareness, whereby perception is dependent solely on the five senses.
- the problem of organized complexity: statistics provides no tools for analyzing organized complexity found in living organisms.

Eastern Mysticism



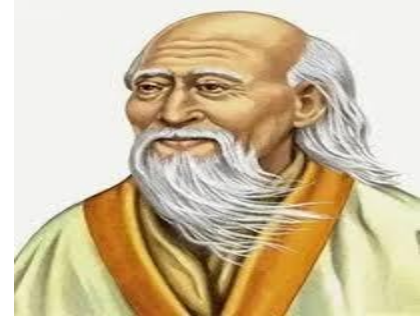
- The direct mystical experience is at the core of all Eastern mysticism.
 - Even those mystics who are engaged in the most sophisticated argumentation never see the intellect as their source of knowledge but use it merely to analyze and interpret their personal experience, thus giving the Eastern traditions a strong empirical character that is also emphasized by its proponents
- D.T.Suzuki writes of Buddhism:
 - **Personal experience is...the foundation of Buddhism philosophy. In this sense, Buddhism is radical empiricism or experientialism, whatever dialectic later developed to probe the meaning of enlightenment-experience.**

Eastern Mysticism



- Joseph Needham repeatedly brings the empirical attitude of Taoists into prominence in his work *Science and Civilization in China*
 - this attitude has made Taoism the basis of Chinese science and technology.
 - The early Taoist philosophers withdrew into the wilderness, the forests and mountains, there to meditate upon the order of nature, and to observe its innumerable manifestations.

Eastern Mysticism



- The same spirit is reflected in the Zen verses

He who would understand the meaning of Buddha-nature

Must watch for the season and the causal relations.

- ‘The firm basis of knowledge on experience in Eastern mysticism suggests a parallel to the firm basis of scientific knowledge on experiment. This is further enforced by the nature of the mystical experience.
- It is described in the Eastern traditions as a direct insight which lies outside the realm of the intellect and is obtained by watching rather than thinking; by looking inside oneself; by observation.

Eastern Mysticism



- The name for Taoist temples, kuan, originally meant **to look**. Taoists regard their temples as places of observations.
- In Ch’an Buddhism, the Chinese version of Zen, enlightenment is often referred to as the vision of the Tao, and seeing is regarded as the basis of knowing in all Buddhist schools. The first item of the Eightfold Path, the Buddha’s prescription for self-realization, is right seeing, followed by right knowing.
- D.T.Suzuki writes
 - **The seeing plays the most important role in Buddhist epistemology, for seeing is at the basis of knowing. Knowing is impossible without seeing; all knowledge has its origin in seeing. Knowing and seeing are thus found generally united in Buddha’s teaching. Buddhist philosophy therefore ultimately points to seeing reality as it is. Seeing is experiencing enlightenment.**

Eastern Mysticism

- The Yaquis mystic Don Juan says
 - **My predilection is to see...because only seeing can a man of knowledge know.**
- A word of caution: the emphasis on seeing in mystical traditions should be taken as metaphorical, since the mystical experience of reality is an essentially non-sensory experience.
- What they do emphasize, however, when they talk about seeing, looking or observing, is the empirical character of their knowledge.



Parallels and Comparisons



This empirical approach of Eastern philosophy is strongly reminiscent of the emphasis on observation in science

- The experimental stage in scientific research seems to correspond to the direct insight of the Eastern mystic, and the scientific models and theories correspond to the various ways in which this insight is interpreted.
- A closer examination shows that the difference lie only in their approach and not in their reliability or complexity.
- Nothing is too wonderful to be true, if it be consistent with the laws of Nature, and in such things as these, experiment is the best test of such consistency—Michael Faraday

Parallels and Comparisons



- Physicists perform experiments involving highly sophisticated technology managed by a team of experts
- Mystics obtain their knowledge purely through observation without any machinery, in privacy of meditation.
- Scientific experiments seem to be repeatable any time and by anyone, while mystical experiences seem to be reserved for a few individuals at special occasions.

Parallels and Comparisons



- Anyone who wants to repeat an experiment in modern physics has to undergo many years of training: only then will she or he be able to ask nature a specific question through experiment and to understand the answer
- Similarly, a deep mystical experience requires many years of training under a master and as in scientific training the time spent in training does not guarantee success. If successful, the student can repeat the experiment. The repeatability of the experience is in fact essential to every mystical training and is the very aim of the spiritual instruction. A mystical experience is not any more unique than a modern experiment in physics: a page from a journal of modern experimental physics will be as mysterious to the uninitiated as a Tibetan mandala. Both are records of enquiries into the nature of the universe.

Parallels and Comparisons



This is particularly relevant to Buddhism which holds that our original nature is that of the enlightened Buddha and that we have just gotten it: babies are born enlightened(just look at their eyes!), and then become traumatized by life and forget the inner Buddha.

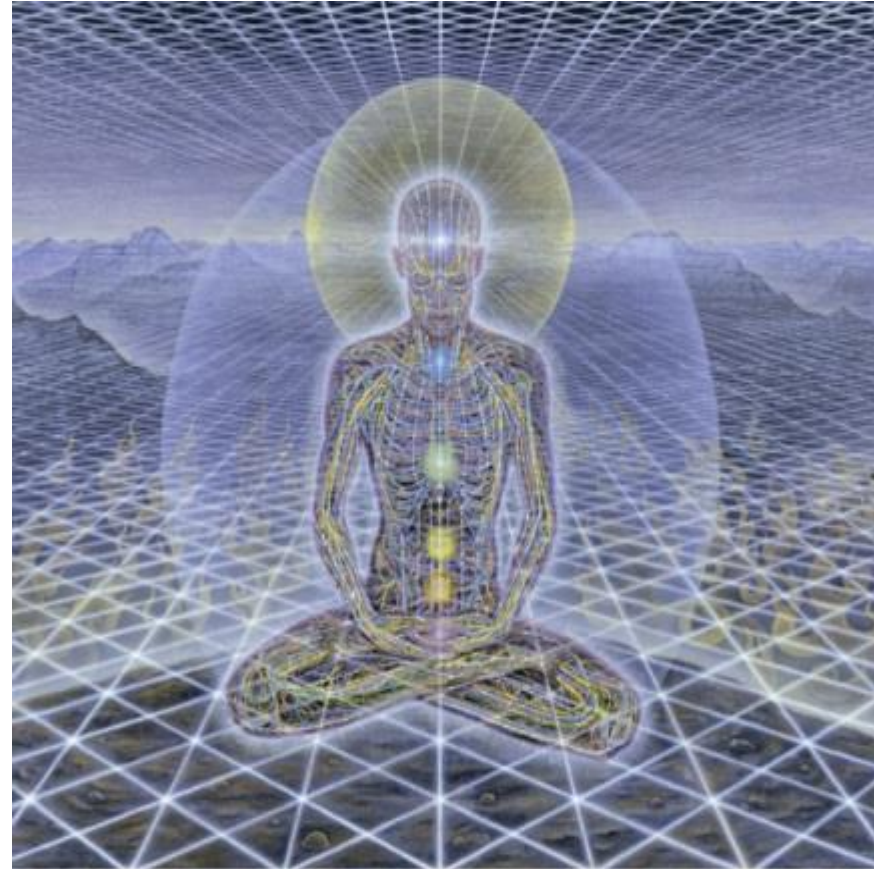
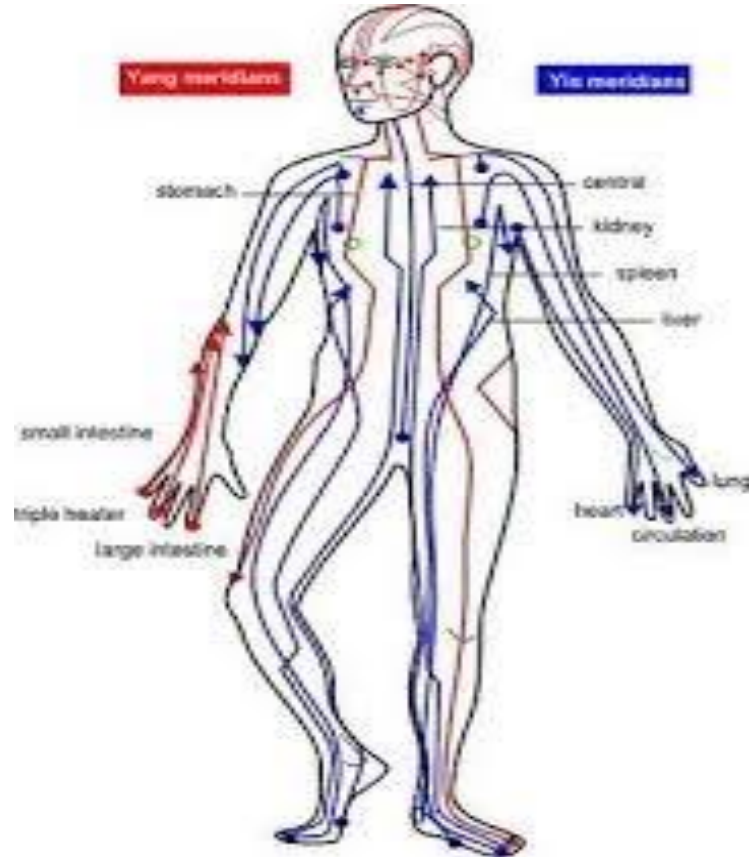
Students of Zen Buddhism are asked to discover their original face, and the sudden remembering of this face is their enlightenment.

Parallels and Comparisons



- Although deep mystical experiences do not, in general, occur without long preparation, direct intuitive insights are experienced by all of us in our everyday lives.
 - We are all familiar with forgetting a name of a person or place and cannot produce it in spite of utmost concentration.
 - We have it on the tip of our tongue, but it will not come out, until we give up and shift our attention to something else
 - Suddenly, we remember the forgotten item. It is a sudden, immediate insight.

Traditional Chinese Medicine Meridians



Humor and Jokes

A Zen master told me,
"Do the opposite of
what I tell you."
So I didn't.

HIGHER LEARNING



- Another well-known example of spontaneous intuitive insights are **jokes**.
- In the split second where you understand a joke, you experience a moment of enlightenment. It is well known that this moment must come spontaneously, that it cannot be achieved by explaining the joke, i.e., by intellectual rational analysis.
- Only with a sudden intuitive insight into the nature of the joke do we experience the liberating laughter the joke is meant to produce.
- The similarity between a spiritual insight and the understanding of a joke must be well known to enlightened men and women, since then almost invariably show a great sense of humor.
- Zen, especially, is full of funny stories and anecdotes, and in the Tao Te Ching we read **if it were not laughed at, it would not be sufficient to be Tao.**

Preparing the Mind: Meditation and Prayer



- In Eastern Mysticism, direct intuitive insights into the nature of things are extended to long periods of time, and ultimately, become a constant awareness.
- The preparation of the mind for this awareness-for the immediate, non-conceptual awareness of reality-is the main purpose of all schools of Eastern mysticism, and of many aspects of the Eastern way of life.
- During the long cultural history of India, China and Japan, an enormous variety of techniques, rituals and art forms have been developed to achieve this purpose, all of which may be called meditation in the widest sense of the word.

Preparing the Mind: Meditation and Prayer



The basic aim of these techniques seems to be to silence the thinking mind and shift awareness from the rational to the intuitive mode of consciousness.

In many forms of meditation, this silencing of the rational mind is achieved by concentrating one's attention on a single item, like one's breathing, the sound of a mantra, or the visual image of a mandala.

Other schools focus the attention on body movements which have to be performed spontaneously without the interference of any thought: this is the way of the Hindu Yoga and of the Taoist T'ai Chi Ch'uan.

The rhythmical movements of these schools can lead to the same feeling of peace and serenity, which is characteristic of the more static forms of meditation; a feeling which, incidentally, may be evoked also in some sports by going **into the zone**. Downhill snow skiing has been used a highly rewarding form of meditation.

Preparing the Mind: Meditation and Prayer



Eastern art forms are forms of meditation.

- They are not so much means for expressing the artist's ideas as ways of self-realization through the development of the intuitive mode of consciousness.
- Indian music is not learned by reading notes, but by listening to the play of the teacher, and thus developing a feeling for the music
- T'ai Chi movements are not learned by verbal instructions but by doing them over and over again in unison with the teacher
- Japanese tea ceremonies are full of slow, ritualistic movements.
- Chinese calligraphy requires the uninhibited, spontaneous movement of the hand. All these skills are used in the East to develop the meditative mode of consciousness.

Meditation and Prayer



- For most people, and especially for intellectuals, this mode of consciousness is a completely new experience.
- Scientists are familiar with direct intuitive insights from their research, because every new discovery originates in such a sudden non-verbal flash. These are extremely short moments which arise when the mind is filled with information, with concepts and with thought patterns. In meditation, on the other hand, the mind is emptied of all thoughts and concepts and thus prepared to function for long periods through its intuitive mode.

Meditation and Prayer



- Lao Tzu speaks about this contrast between research and meditation:

He who pursues learning will increase every day

He who pursues Tao will decrease every day

- When the rational mind is silenced, the intuitive mode produces an extraordinary awareness: the environment is experienced in a direct way without the filter of conceptual thinking.
- In the words of Chuang Tzu, The still mind of the sage is a mirror of heaven and earth-the glass of all things. The experience of oneness with the surrounding environment is the main characteristic of this meditative state. It is a state of consciousness where every form of fragmentation has ceased, fading away into undifferentiated unity, alertness of the warrior's mind in a unique way.

Meditation and Prayer: The Warrior



- In deep meditation, the mind is completely alert. In addition to the non-sensory apprehension of reality it also takes in all the sound, sights and other impressions of the surround environment, but it does not hold the sensory images to be analyzed or interpreted. They are not allowed to distract attention.
- Such a state of awareness is not unlike the state of mind of a warrior who expects an attack in extreme alertness, registering everything that goes on around him without being distracted by it for an instant. The Zen master Yasutani Roshi uses this image in his description of shikan-tazaa, the practice of Zen meditation

Meditation and Prayer: The Warrior



Shikan-taza is a heightened state of concentrated awareness wherein one is neither tense nor hurried, and certainly never slack. It is the mind of somebody facing death.

Let us imagine that you are engaged in a duel of swordsmanship of the kind that used to take place in ancient Japan.

As you face your opponent, you are unceasingly watchful, set, ready.

Were you to relax your vigilance even momentarily, you would be cut down instantly.

A crowd gathered to see the fight. Since you are not blind you see them from the corner of your eye, and since you are not deaf, you hear them. But not for an instant is your mind captured by these sense impressions.

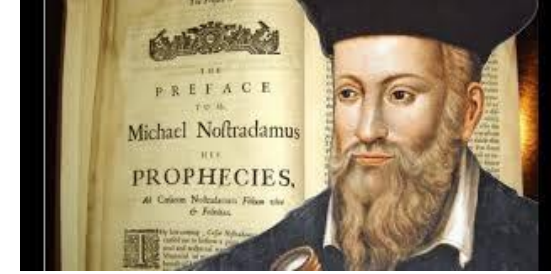
Meditation and Prayer: The Warrior



Because of the similarity between the meditative state and the frame of mind of a warrior, the image of the warrior plays an important role in the spiritual and cultural life of the East.

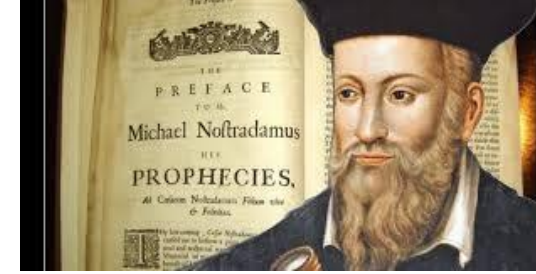
- The stage of the Bhagavad Gita is a battlefield and martial arts constitute an important part in the traditional cultures of China and Japan.
- In Japan, the strong influence of Zen on the traditions of the samurai gave rise to what is known as bushido, the way of the warrior, art of swordsmanship where the spiritual insight of the swordsman reaches its highest perfection.
- The Taoist T'ai Chi Ch'uan which was considered to be the supreme martial art in China combines slow and rhythmical yogic movements with the total sensory input to the body

Words Are Not Sufficient



- Since words are always an abstract, approximate map of reality, the verbal interpretation of a scientific experiment or of a mystical insight is necessarily inaccurate and incomplete. Thus the aphorism of Albert Einstein
- **As far as the laws of mathematics refer to reality, they are not certain**
- Physicists know that their methods of analysis and logical reasoning can never explain the whole realm of natural phenomena at once, and so they single out a certain group of phenomena and try to build a model to describe this group. In particular, clothes its statements in the form of myths, using metaphors and symbols, poetic images, similes and allegories.
- Mythical language is much less restricted by logic and common sense. It is full of magic and of paradoxical situations, rich in suggestive images and never precise, and can thus convey the way in which mystics experience reality much better than factual language.

Words Are Not Sufficient



How do the Eastern traditions deal with the problem of verbal communication?

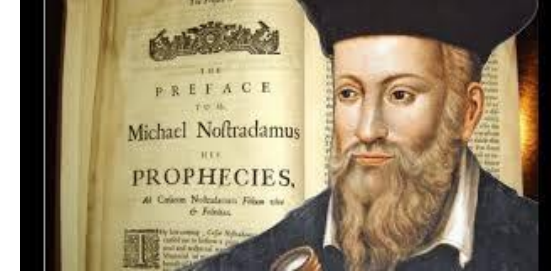
Mystics are mainly interested in the experience of reality and not in the description of this experience.

They are therefore generally not interested in the analysis of such a description and the concept of a well-defined approximation has thus never arisen in Eastern thought.

If on the other hand, Eastern mystics want to communicate their experience, they are confront with the limitations of language. Several different ways have been developed in the East to deal with this problem

- Indian mysticism, and
- Hinduism, in part

Words Are Not Sufficient

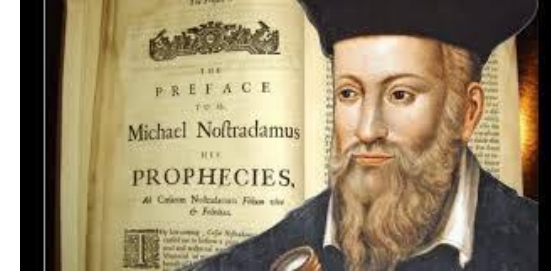


According to Ananda Coomaraswamy,

Myth embodies the nearest approach to absolute truth that can be stated in words

- The rich Indian imagination has created a vast number of gods and goddesses whose incarnations and exploits are the subjects of fantastic tales, collected in epics of huge scope. The Hindu with deep insight knows that all these gods are creations of the mind, mythical images representing the many faces of reality. The mystic knows they were not merely created to make the stories more attractive, but are essential vehicles to convey the doctrines of a philosophy rooted in mystical experience.

Words Are Not Sufficient



Chinese and Japanese mystics have found a different way of dealing with the language problem. Instead of making the paradoxical nature of reality palatable through the symbols and images of myth, they prefer very often to accentuate it by using factual language.

- Taoists make frequent use of paradoxes in order to expose the inconsistencies arising from verbal communication, and to show its limits.
- They have passed this technique on to Chinese and Japanese Buddhists, who have developed it further.
- It has reached its extreme in Zen Buddhism with the so-called **koans**, those nonsensical riddles which are used by many Zen masters to transmit the teachings. These koans establish an important parallel to modern physics as we shall see.

Words As Intuitive Guideposts



- In Japan there exists yet another mode of expressing philosophical views: a special form of extremely concise poetry which is often used by Zen masters to point directly at the suchness of reality. When a monk asked Fuketsu Ensho

When speech and silence are impossible, how can one pass without error.

The master replied

I always remember Kiangsu in March

The cry of the partridge,

Words as Intuitive Guideposts



This form of spiritual poetry has reached its perfection in **haiku**, a classical Japanese verse of just seventeen syllables, which was deeply influenced by Zen. The insight into the nature of Life reached by these haiku poets comes across in the English translation

Leaves falling

Lie on one another;

The rain beats the rain

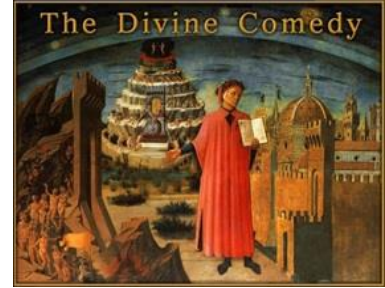
- Whenever the Eastern mystics express their knowledge in words with the help of myths, symbols, poetic images or paradoxical statements- they are well aware of the limitations posed by language and linear

Words as Intuitive Guideposts



Modern physics has come to take exactly the same attitude with its verbal models and theories. They too are only approximate and necessarily inaccurate. They are the counterparts of Eastern myths, symbols and poetic images, and here lie parallels. The same idea about matter is conveyed, for example to the Hindu by the cosmic dance of the god Shiva as to the physicist by certain aspects of quantum field theory.

- **Both the dancing god and the physical theory are creations of the mind: models to describe an intuition of reality.**



Beyond Language

- The notion that all scientific models and theories are approximate, and their verbal interpretations always suffer from the inaccuracy of our language, was commonly accepted by scientists at the beginning of the 20th century, when a new and completely unexpected development took place.
 - The study of atoms forced physicists to realize that our common language is not only inaccurate, but totally inadequate to describe the atomic and subatomic reality
 - Quantum theory and relativity theory, the two bases of 20th century physics, made it clear that this reality transcends classical logic, and that we cannot talk about it in ordinary language.



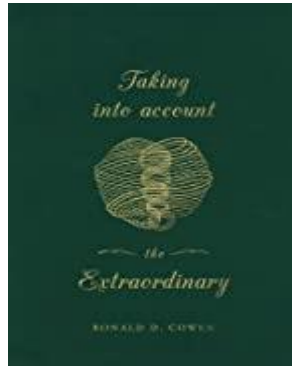
Beyond Language

- Thus, Werner Heisenberg writes
 - **The most difficult problem...concerning the use of the language arises in quantum theory. Here we have at first no simple guide for correlating the mathematical symbols with concepts of ordinary language; the only thing we know from the start is the fact that our common sense concepts cannot be applied to the structure of the atom.**
- D.T.Suzuki writing about Buddhism says:
 - **The contradiction so puzzling to the ordinary way of thinking comes from the fact that we have to use language to communicate our inner experience which in its very nature transcends linguistics.**
- One writes about atomic physics, the other about Buddhism, yet the two passages are almost identical. Both the physicist and the mystic want to share their knowledge, when they do so with words the statements are paradoxical and full of logical contradictions.

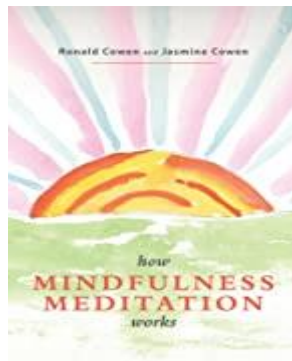
Ronald Cowen, 1940-2019



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