

ANNEXURE 2

Physics-Philosophy/Science-Mysticism Interface Research

Dr Gopal Chandra Bhar who retired as Professor of Physics from the University of Burdwan, West Bengal, and is a Laser physicist of international repute, has been engaged since the inception of our University, in the following interesting project: to research into, document and compile the entire volume of literature that has been published over a century, right from the beginning (1900) of the last century when the quantum theory was born up to the present day, on the interface between physics and philosophy, science and mysticism etc. Swami Vivekananda spoke of such an intermingling of science and religion more than a century ago in his famous lectures on Jnana Yoga delivered in England:

“We want today that bright sun of intellectuality joined with the heart of Buddha, the wonderful infinite heart of love and mercy. This union will give us the highest philosophy. Science and religion will meet and shake hands. Poetry and philosophy will become friends. This will be the religion of the future, and if we can work it out, we may be sure that it will be for all times and peoples. This is the one way that will prove acceptable to modern science, for it has almost come to it.”

This Compendium is likely to run to more than a thousand pages of printed matter and will be an extremely useful reference manual for those interested in research in this important emerging area. The following synopsis prepared by Professor Gopal Chandra Bhar gives the summary of his tireless endeavour over the years in compiling and documenting the evidence of such interface.

Synopsis prepared by Professor Gopal Chandra Bhar:

Philosophy of Science explores the possibilities, conditions, constraints, and limitations of scientific knowledge. Philosophy of science focuses on metaphysical, epistemic and semantic aspects of science. It is not uncommon in this context to begin by seeking answers to the following six questions:

1. How do we gain knowledge about the world?
2. How can we justify such knowledge?
3. What is a scientific explanation?
4. How can we represent knowledge, and does it determine what we can know?
5. Are there facts and natural laws? Is it possible to know the truth?
6. How to define the boundary between science and non-science?

Since the beginning of the last century in the span of one hundred years and more there have been tremendous developments in science and technology especially in Physical sciences, Biological sciences, Computer sciences and technology. Mental sciences or Psychology have also been progressing alongside, giving us great insights into the inner workings of the human psyche. Indian philosophy, particularly the Upanishadic philosophy called Vedanta conceives of a human being as possessing a five-layered personality: annamaya, pranamaya,

manomaya, vijnanamaya, anandamaya—physical level, biological, psychological (or mental), intellectual and blissful. A perusal of the books that have been published and are being continually published on the interface of modern science and philosophy, it appears that modern science is beginning to confirm the great truths of Indian Philosophy, both of them being paths towards the realisation of the same Truth. The interesting outcome is that the developments in modern sciences not only do not contradict the wisdom enshrined in the ancient Indian books, in Indian philosophy and mysticism, but also in most cases support and supplement them. Prof Capra, in his famous book *The Tao of Physics* says that the findings of all mystical traditions whether in the East and or the West, are in consonance with modern Physics. He also says “Science does not need mysticism and mysticism does not need science but man needs both.”

A. Physical Sciences

The central aim of physics is to understand matter and energy and the interaction thereof in the world around us. It is not quite clear exactly what this means. However, physicists often take the pragmatic viewpoint that ‘understanding the world’ means to be able to predict its behavior from a small set of well motivated principles.

What science teaches us is something about the way God thinks. In fact, this is what Newton thought. If you believe God is the creator, then science can teach you a great deal about the nature of the mind of God. God created the vast scale of the evolving universe, governed by cause and effect, particles and forces, emergence of complexity out of simplicity, life shaped by evolutionary processes.

The last century has seen developments of Physics in the following three areas after the breakdown of the so-called classical or Newtonian Physics: Relativity and Cosmology, Quantum Physics, and Chaos & Self-organisation. In Classical Physics the universe is treated as a giant machine where anything can be predicted from the present trend of events. Here space and time are regarded as absolute and the principle of causality is ever satisfied. With the rise of the new physics beginning with quantum theory, and the theories of special and general relativity at the beginning of the last century, our conception of space, time and matter—the cosmos in its microcosmic and macrocosmic aspects—have undergone a revolution. The break-down of determinism in the world of the microcosm thanks to Heisenberg’s uncertainty principle brought about a great change in our worldview. One of the consequences of Quantum Physics is that we radically change whatever we observe. It is similar to the legendary King Midas never knew the feel of human hand after everything he touched turned to gold!

Given below is a brief summary of the contents of the books reviewed and included in each of the sub-sections of Physical Sciences, with the number in the parenthesis denoting the number of books in each category.

A.1 Quantum Physics (130)

Classical physics is the physics of everyday objects. Classical laws of motion govern the motion of anything large enough to see with the naked eye. Modern physics describes the stranger world that we see when we go beyond the everyday. This world was first revealed in experiments done in the late 1800s and early 1900s, which cannot be explained with classical laws of physics. Quantum physics is the name given to a part of modern physics dealing with light and objects that are very small like molecules, atoms, subatomic particles. Relativity of Einstein, also a part of modern Physics is a subject matter of discussion in the next section. Quantum physics has all sorts of weird and wonderful properties. Particles behave like waves, and waves behave like particles. Particle properties are indeterminate until we measure them. With the advent of quantum mechanics, the predictability in Newtonian Physics breaks down. Certainty is replaced by probability in Quantum Physics. Moreover, the trajectory of such subtle particle became uncertain through Heisenberg principle—either position or momentum cannot be certain at the same time. At least one photon being required to effect the

measurement, the participation of the observer in the measurement itself leads to interesting consequences.

The objective reality is transformed into subjective one in the quantum regime. Thus we are led into two aspects of this new subject. Modern life would have been impossible without quantum physics since without understanding the nature of the electron, atom and photon it would have been impossible to make the semiconductor chips that run our computers, it would be impossible to make the lasers we use to send messages over fiber-optic communication lines. Quantum physics also places limits on what we can know about the universe and the properties of objects in it. It changes our understanding of what it means to make a measurement. It requires a complete rethinking of the nature of reality at the most fundamental level. The world described in quantum theory is our world, at a microscopic scale. Certain strange effects like connectivity, wholeness predicted by quantum physics are real, with real consequences and applications. This leads one to think that the subatomic world in actuality is an undivided whole, where the boundary between the observer and the observed is blurred. Object and subject have become inseparable, spatial and temporal detachment is an illusion.

A.2 Cosmology and Relativity (I30)

In *The Cosmic Blueprint*, Davies addresses questions on the creation of the universe:

- A. Can known physical processes explain the continuing creativity of nature?
- B. Are the seemingly endless varieties of natural forms and structures that appear as the universe unfolds simply the accidental products of random forces?
- C. Is the present state of the universe in some sense predestined? Is there a cosmic blueprint?

He proceeds to an examination of how scientific advances are transforming our understanding of the emergence of complexity and organization in the universe. Melding ideas and disciplines from biology, fundamental physics, computer science, mathematics, genetics, and neurology, he presents a provocative theory on the source of the universe's creative potency.

A.3 Chaos, Self-organisation and Order (I26)

All isolated systems proceed according to the second law of thermodynamics, from order to disorder, until it has reached a state of equilibrium in which all processes - motion, heat exchanged, and so on - have come to a standstill. Living organisms function, on the other hand quite differently. They are open systems, which means that they have to maintain a continuous exchange of energy and matter with their environment to stay alive. This exchange involves taking in ordered structures, such as food, breaking them down and using some of their components to maintain or even increase the order of the organism. This process is known as metabolism. It allows the system to remain in a state of non-equilibrium, in which it is always "at work." A high degree of non-equilibrium is absolutely necessary for self-organisation; living organisms are open systems that continually operate far from equilibrium.

At the same time these self-organising systems have a high degree of stability, and this is where we run into difficulties with conventional language. The dictionary meanings of the word "stable" include "fixed", "not fluctuating", "unvarying," and "steady," all of which are inaccurate to describe organisms. The stability of self-organising systems is utterly dynamic and must not be confused with equilibrium. It consists in maintaining the overall structure in spite of ongoing changes and replacements of its components. They also exhibit a certain degree of autonomy; for example, they tend to establish their size according to internal principles of organisation, independent of environmental influences

The internal plasticity and flexibility of living systems, whose functioning is controlled by dynamic relations rather than rigid mechanical structures, gives rise to a number of characteristic properties that can be seen as

different aspects of the same dynamic principle-the principle of self-organisation

This does not mean that living systems are isolated from their environment; on the contrary, they interact with it continually, but this interaction does not determine their organisation. The two principal dynamic phenomena of self-organisation are self-renewal-the ability of living systems continuously to renew and recycle their components while maintaining the integrity of their overall structure-and self-transcendence-the ability to reach out creatively beyond physical and mental boundaries in the processes of learning, development, and evolution.

The phenomenon of self-organisation is not limited to living matter but occurs also in certain chemical systems, which have been studied extensively by the physical chemist and Nobel laureate Ilya Prigogine, who developed a detailed dynamic theory to describe their behaviour. Prigogine has called these systems “dissipative structures” to express the fact that they maintain and develop structure by breaking down other structures in the process of metabolism, thus creating entropy - disorder

A.4 Space, Time and Causality (112)

When asked to summarize the general theory of relativity in one sentence, Albert Einstein is said to have stated: “Time and space and graviton have no separate existence from matter”.

He also stated in *Metaphysics of Relativity* as follows:

Physical objects are not in space, but these objects are spatially extended (as fields). In this way the concept ‘empty space’ loses its meaning. ... The field thus becomes an irreducible element of physical description, irreducible in the same sense as the concept of matter (particles) in the theory of Newton. ... The physical reality of space is represented by a field whose components are continuous functions of four independent variables - the co-ordinates of space and time. Since the theory of general relativity implies the representation of physical reality by a continuous field, the concept of particles or material points cannot play a fundamental part, nor can the concept of motion. The particle can only appear as a limited region in space in which the field strength or the energy density are particularly high.

In classical mechanics, there is an objectively existing world. The future is completely determined by the present (or past) state of matter. There is no room for choice or creativity of any kind. The basic distinction between science and magic is the concept of causality which is associated with connectedness. The latter is called common sense the origin date far back from Newton to Greek civilisation. The causality is based on locality. Since in the theory of Relativity nothing can move faster than light, non-local connectedness is not allowed and so the principle of causality is challenged and here it gives the so-called probabilistic interpretation of events.

A.5 Connectedness, Wholeness and Fabric (66)

When we have a narrow perception of reality, it creates illusionary lines of separation. This separation traverses from personal, societal, cultural and expanding into the world. The interconnectedness of the parts of the whole allows us to realize our oneness with all things. Physicist David Bohm, in his plasma experiments at the Berkeley Radiation Laboratory found that individual electrons act as part of an interconnected whole. This scientific discovery of non-locality meant that everything is joined or connected together. Space and time is composed of the same essence of matter, as Einstein formulated in the General Theory of Relativity. Since all matter and events interact with each other, time (present, past and future) along with space and distance, all is relative to observer and operate as one under the law of non-locality. This law of quantum physics states that once connected, objects affect one another forever no matter where they are as if an invisible stream of energy will always connect any two objects that have been connected in any way in the past. This model birthed holographic model of the universe and also adopted by the neuroscientist Karl Pribram to explain the

behaviour of brain. He theorized brain is a pattern and frequency analyser which creates reality by interpreting frequencies from beyond space and time dimensions.

The notion that all these fragments separately existent is evidently an illusion, and this illusion cannot do other than lead to endless conflict and confusion. Indeed, the attempt to live according to the notion that the Living as fragments are really separate is, in essence, what has led to the growing series of extremely urgent crises that is confronting us today. Thus, as is now well known, this way of life has brought about pollution, destruction of the balance of nature, over-population, world-wide economic and political disorder and the creation of an overall environment that is neither physically nor mentally healthy for most of the people who live in it. Individually there has developed a widespread feeling of helplessness and despair, in the face of what seems to be an overwhelming mass of disparate social forces, going beyond the control and even the comprehension of the human beings who are caught up in it. (David Bohm, Wholeness and the Implicate Order, 1980)

The acceptance that we are interconnected in life to everything in the universe will help the people of the world open their eyes and really look at many new possibilities. All particles are connected to everything... and everything is connected to everyone... we are inseparable from any other part of the universe. This also suggests that we are not only connected to inanimate objects but that we are also connected in death. The sooner we recognize our relationship with world around us, the sooner we recognize our inner choice of peace mirrored as gentle weather patterns, the healing of our societies, and peace between nations.

A.7 Psychology (181)

Several psychological capabilities of mind is discussed under this heading which includes :Spiritual Intelligence, Ethics/Morality, Subconscious Mind, Awakening divine potential, Psychiatry, Develop psychic powers, Self-awareness, Awakening intellectual potential (Genius).

Spiritual Intelligence

Spiritual intelligence is a quality inherent in the process of being. It is not a rational intellectual faculty that can be brought analytically. Since it is inherent it needs developing. In that discovery process one would realize that one is undergoing development. Since about 5 percent of our brain is only being utilized, like the similar amount of the universe is visible rest being dark matter per cosmologists finding, it is possible to utilize the remaining 95 percent of the brain consciously. This organic wisdom which we are constantly carrying with us, like the vedantic saying tat tam asi (you are the spiritual being having the human experience) may sometimes runs counter to everything that makes sense. This knowing is in full alignment with universal truth. This innate wisdom is gaining support from science. Rupert Sheldrake called it morphic resonance in biology; other examples are holistic practice in homoeopathy, holography . entanglement in Quantum Physics and so on. Spiritual quotient in contrast to widely talked Intelligent quotient is considered to be the prime success factor in life.

Intuition

Intuition is our connection to the universal, life force that resides within everyone and everything. It is felt as deep wisdom, an inner knowing and is an internal source of knowledge and understanding. As one develops intuition one begins to sense what feels right and true at any given time. Some people think that intuition is a "special gift", which certain people have and others do not. We all have intuitive ability. Admittedly some people are more intuitive than others. Intuition also comes in the form of connectedness for some while for other under relaxation, but certainly not under medication. Intuitive guidance can range from a niggling feeling to a strong indicator or message.

Intuition is defined as 'instinctive knowledge' or an impression. It is sometimes even referred as one's inner guidance or voice. Whatever you choose to call it, intuition is unmistakable, as it seems to be a part of human

design. It perhaps can be likened to one of our unnamed senses, and believe it or not, you have the capacity to develop it further.

It works without any reason unlike intellect. God gave him wisdom and insight, something that scripture shows are two distinct abilities of the mind. With wisdom comes understanding and insight comes an intuitive knowledge that is gained from wisdom.

Insight is defined as 'grasping the inner nature of things intuitively.' Through Solomon's lifestyle example, we are shown that hidden knowledge can exist with wisdom and helps one to make better decisions, but the niggling feeling deep within is usually ignored.

There are four or five primary types of human extra-sensory perceptions. Many people use a combination of these. But it is not uncommon to have one more developed than the rest.

Clairvoyance: seeing a clear picture

Clairaudience: hearing inspired thoughts

Clairessence: sensing smells which are not present, e.g. roses, essential oils

Empathy: feeling other people's energy and Dreaming (Déjà vu).

Subconscious Mind

The prescription given in the book *The Genie Within: Your Subconscious Mind--How It Works and How to Use It* by Harry Carpenter for learning to control the subconscious mind are:

- » Change undesirable habits
- » Increase self-esteem,
- » Learn faster and retain more,
- » Be successful,
- » Improve your memory,
- » Be more creative,
- » Improve your mental and physical health,
- » Communicate with your subconscious mind to verify hunches, interpret dreams etc
- » Teach your subconscious mind to work with your conscious mind rather than against it,
- » Motivate yourself and improve work habits,
- » Monitor the input to your subconscious mind,
- » Relax more completely and sleep better,
- » How to instantly transform a gloomy mood into a joyous one.

B. Natural Sciences (Bio-sciences):

Machines function according to linear chains of cause and effect, and when they break down a single cause for the breakdown can usually be identified. In contrast, the functioning of living organisms in natural sciences is guided by cyclical patterns of information flow known as feedback loops. For example, component A may affect component B; B may affect C; and C may "feed back" the influence to A and thus close the loop. When such a system breaks down, the breakdown is usually caused by multiple factors that may amplify each other through interdependent feedback loops. Which of these factors that may amplify each other through interdependent feedback loops. Which of these factors was the initial cause of the breakdown is often irrelevant.

The mechanism of life is an amazing mystery. It is not all a simple matter. It is regulated by the automatic nervous system and automatic functioning of hormones including respiration and blood circulation working full time keeping us alive without special efforts or intervention on our part except under illness. Genes control these vital systems in perfect harmony.

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systems, which have been studied extensively by the physical chemist and Nobel laureate Ilya Prigogine, who developed a detailed dynamic theory to describe their behaviour. Prigogine has called these systems “dissipative structures” to express the fact that they maintain and develop structure by breaking down other structures in the process of metabolism, thus creating entropy - disorder - which is subsequently

Even though they are capable of maintaining and repairing themselves, no complex organisms can function indefinitely. They gradually deteriorate in the process of ageing and, eventually, succumb to exhaustion even when relatively

Fluctuations play a central role in the dynamics of self-maintenance. Any living system can be described in terms of interdependent variables, each of which can vary over a wide range between an upper and a lower limit. All variables oscillate between these

The ability to adapt to a changing environment is an essential characteristic of living organisms and of social systems. Higher organisms are usually capable of three kinds of adaptation, which come into play successively during prolonged environmental changes. A person who goes from sea level to a high altitude may begin to pant and her heart may race

Through somatic change the organism recaptures some of its flexibility by substituting a deeper and more enduring change for a more superficial and reversible one. Such an adaptation will be achieved comparatively slowly and will be slower to reverse. Yet somatic changes are still reversible. This means that various circuits of the biological system

The third kind of adaptation available to living organisms is the adaptation of the species in the process of evolution. The changes brought about by mutation, also known as genotypic changes, are totally different from somatic changes

In a balanced ecosystem animals and plants live together in a combination of competition and mutual dependency. Every species has the potential of undergoing an exponential population growth but these tendencies are kept in check by various controls and interactions. When the system is disturbed, exponential “runaways” will start to appear. Some plants will turn into “weeds” and some animals into “pests,” and other species will be exterminated

B.10 Cell-Biology (62)

Cells are the fundamental units of life. Whether they be unicellular or multicellular life forms, all living organisms are composed of and depend on cells to function normally. Scientists estimate that our bodies contain anywhere from 25 to 100 trillion cells. As for example, 7,000,000 of the 25,000,000,000,000 red blood cells in the body of an average man die every second, so that 7,000,000 new ones must be produced every second of our lives--a wonderful example of the creative operations always at work in our bodies. Cell biology does not stand alone as a discipline but is closely related to other areas of biology such as genetics, molecular biology, and biochemistry. They perform the essential vital functions like extracting and building energy from their environment, constructing repairing and regulating the internal functions, periodically diving and cleaning waste etc. It is important to know the following facts on cell:

There are more bacterial cells in the body than human cells,

Cells have varying life spans,

Cells contain genetic material DNA carrying the genetic information necessary for directing cellular activities,

Different types of cells reproduce through different methods,

Cells contain structures for specific functions like providing energy to producing hormones and enzymes.

Unlike straight forward Newton's Laws of Motion, Laws of Thermodynamics and Electromagnetism in physical sciences, the cell biology have complex functionaries which are organized and orchestrated to meet the essentials of life mechanism. This leads to search of mechanisms in the words of Francis Crick “What is found

in Biology is mechanisms, mechanisms built with chemical components....". As such it encompasses areas like Bio-chemistry, Bio-physics, Neuro-biology, Neuroplasticity etc.

B.9 Fingerprint of God/Gene(DNA) (77)and B.10 Neuro-Sciences including Consciousness (110)

Genetic characteristics are inescapable that pass from generation to generation. But environment and other factors. So genes are not fixed but subject to changes. Originally it follows the trend from heredity but exercise changes. We cannot blame our parents for lack of our aptitudes say in sports, music or in science/engineering. The traits are indeed transmitted genetically but it is also true that regular exercise can improve muscle and health. In neurological terms the undesired genes are switches off in preference to helpful genes. So the brain is not hard-wired, it is soft-wired by experience. The environment can also trigger this on/off mechanism. Research shows the way of our thinking can activate our genes. Learning how to activate positive genes and deactivate negative genes could open up infinite possibilities of human potential. It is possible to activate the parts of the brain that have been underactivated and calm down those areas that have been hyperactivated so that one can feel positive and remain calm during stressful time.

In his book *The Genius in All of Us*, David Shenk beautifully explains why the nature-nurture debate is dead. It is not just the genes we are born with, but how we are raised and what opportunities are open to us that determine how smart we will become. Nurture and experience reshape our genes, and thus our brain. Shenk argues that the idea we are either born with genius or talent, or we aren't, is simply untrue. The notion that relentless, deliberate practice changes the brain and thus our abilities has been undervalued over the past 30 years in favor of the concept of "innate giftedness." Practice, practice, practice is what it takes. Shenk argues that it is just some fantasy that effortless, gifted genius is born and not made. He marshals evidence to show that genetic factors do not trump environmental factors but rather work in concert with them. Shenk argued we can train ourselves to be successful—even if we are born with only average genetic talent. Scientists know that how we are raised and how we are trained affects the expression of our genes. If you think you've reached your talent limit, think again, Shenk says. It's not just in your genes, he says, but in the intensity of your motivation. Ambition, persistence, and self-discipline are not just products of genes, but can be shaped by nurture and environment. Certainly it is important to have good genes, but that determines at most only 50 percent of your talent. Shenk gives the hopeful message not just for kids, but also for adults. Happily for us, the human brain remains plastic, changeable and trainable well into old age. And that's why our scripture teaches that we learn as long as we live and asks to follow *daiva* and *purushokar* simultaneously for success in life.

Based on new evidence culled from their brain-scan studies on memory patients and meditators, their Web-based survey of people's religious and spiritual experiences, and their analyses of adult drawings of God, neuroscientist Andrew Newberg, therapist Mark Robert Waldman, and their research team have concluded that active and positive spiritual belief changes the human brain for the better. What's more, actual faith isn't always necessary: atheists who meditate on positive imagery can obtain similar neurological benefits. Written in an accessible style—with illustrations highlighting how spiritual experiences affect the mind—*How God Changes Your Brain* Andrew Newberg offers the following breakthrough discoveries:

- Not only do prayer and spiritual practice reduce stress and anxiety, but just twelve minutes of meditation per day may slow down the aging process.
- Contemplating a loving God rather than a punitive God reduces anxiety, depression, and stress and increases feelings of security, compassion, and love.
- Fundamentalism, in and of itself, is benign and can be personally beneficial, but the anger and prejudice generated by extreme beliefs can permanently damage your brain.
- Intense prayer and meditation permanently change numerous structures and functions in the brain—

altering your values and the way you perceive reality.

How God Changes Your Brain is both a revelatory work of modern science and a practical guide for readers to enhance their physical and emotional health and to avoid mental decline. Newberg and Waldman explain the eight best ways to “exercise” your brain and guide readers through specific routines derived from a wide variety of Eastern and Western spiritual practices that improve personal awareness and empathy. They explain why yawning heightens consciousness and relaxation, and they teach “Compassionate Communication,” a new mediation technique that builds intimacy with family and friends in less than fifteen minutes of practice.

Unique in its conclusions and innovative in its methods, How God Changes Your Brain is a first-of-a-kind book about faith that is as credible as it is inspiring.

Our research has led us to the following conclusions:

- i. Each part of the brain constructs a different perception of God.
- ii. Every human brain assembles its perceptions of God in uniquely different ways, thus giving God different qualities of meaning and value.
- iii.
- iv. Spiritual practices, even when stripped of religious beliefs, enhance the neural functioning of the brain in ways that improve physical and emotional health.
- v. Intense, long-term contemplation of God and other spiritual values appears to permanently change the structure of those parts of the brain that control our moods, give rise to our conscious notions of self, and shape our sensory perceptions of the world.
- vi. Contemplative practices strengthen a specific neurological circuit that generates peacefulness, social awareness, and compassion for others.

Spiritual practices also can be used to enhance cognition, communication, and creativity, and over time can even change our neurological perception of reality itself. Yet, it is a reality that we cannot objectively confirm. Instead, our research has led us to conclude that three separate realities intermingle to give us a working model of the world: the reality that actually exists outside of our brain, and two internal realities—maps that our brain constructs about the world. One of these maps is subconscious and primarily concerned with survival and the biological maintenance of the body. But this map is not the world itself; it’s just a guide that helps us navigate the terrain. Human beings, however, construct a second internal reality—a map that reflects our conscious awareness of the un...

The notion that relentless, deliberate practice changes the brain and thus our abilities has been undervalued over the past 30 years in favor of the concept of “innate giftedness.” Practice, practice, practice (some say 10,000 hours or more) is what it takes. Shenk argues that it is just some fantasy that effortless, gifted genius is born and not made. He marshals evidence to show that genetic factors do not trump environmental factors but rather work in concert with them.

B.12 Evolutionary aspects (108)

Darwin famously explained how life on Earth has gradually evolved from primitive microbes to the rich diversity of the biosphere that we see today. However, he left open the question of how the first living thing came into existence. And it remains deeply problematic. How did lifeless chemicals transform themselves spontaneously into the first living thing? The process in which life forms arise from similar life forms. It asserts that living things can only be produced by another living thing, and not by a non-living thing as attributed to Louis Pasteur. All that necessarily is that matter to interact with the conditions that created life. Once created evolution would take place. “It is an inherent property of matter to become alive”.

B.14 Philosophy of Natural Sciences Mind and Consciousness (209)

Science and mysticism are two complementary manifestations of the human mind, of its rational and intuitive faculties

Eastern mysticism is based on direct insight into the nature of reality, and physics is based on the observation of natural phenomena in scientific experiments

Consciousness is the biggest mystery. It may be the largest outstanding obstacle in our quest for a scientific understanding of the universe. The science of physics is not yet complete, but it is well-understood; the science of biology has removed many ancient mysteries surrounding the nature of life. There are gaps in our understanding of these fields, but they do not seem intractable. We have some idea of what a solution to these problems might look like; we just need to get the details right.

Even in the science of the mind, much progress has been made. Recent work in cognitive science and neuroscience is leading us to a better understanding of human behavior and of the processes that drive it. We do not have many detailed theories of cognition, to be sure, but the details cannot be too far off. Consciousness, however, is as perplexing as it ever was. It still seems utterly mysterious that the causation of behavior should be accompanied by a conscious inner life.

We have good reason to believe that consciousness arises from physical systems such as brains, but we have little idea how it arises, or why it exists at all. How could a physical system such as a brain also be an experiencer? Why should there be something it is like to be such a system? Present-day scientific theories hardly touch the really difficult questions about consciousness. We do not just lack a detailed theory; we are entirely in the dark about how consciousness fits into the natural order.

The problem of consciousness lies uneasily at the border of science and philosophy. I would say that it is properly a scientific subject matter: it is a natural phenomenon like motion, life, and cognition, and calls out for explanation in the way that these do. But it is not open to investigation by the usual scientific methods. Everyday scientific methodology has trouble getting a grip on it, not least because of the difficulties in observing the phenomenon. Outside the first-person case, data are hard to come by. This is not to say that no external data can be relevant, but we first have to arrive at a coherent philosophical understanding before we can justify the data's relevance. So the problem of consciousness may be a scientific problem that requires philosophical methods of understanding before we can get off the ground

C.15 Spirituality and Mysticism (196)

In many ways, religion has become a matter of the heart and science has become a matter of the mind. This regrettable state of affairs does not reflect the fact that physiologically one cannot exist without the other. Everybody needs both. Mind and heart are only different aspects of us. To paraphrase an old Chinese saying, mystics understand the roots of the Tao but not its branches... scientists understand its branches but not its roots. Science does not need mysticism... and mysticism does not need science... but men and women need both. Mystical experience is necessary to understand the deepest nature of things and science is essential for modern life.

Decade-wise Growth of Activity in the area of Physics-Philosophy, Science-Mysticism Interface from the beginning of the last century upto present decade of this century, as revealed by the number of publications in the various fields mentioned above

University Yearbook (Academic Audit Report 2005-10)

Subject Category	Decade 2000-10	Decade 1990-99	Decade 1980-89	Decade 1970-79	Decade 1960-69	Decade 1950-59	Decade 1940-49	Decade 1930-39	Early 20th Cent. + Misc.	Total: Subject wise
1.Quantum Physics	51	41	20	14	4	2	-	-	-	132
2.Cosmology Including Big Bang	61	39	11	4	6	3	1	-	-	125
3.Astronomy	19	5	1	-	-	-	1	-	1	27
4.Chaos, Self-Organization Order	34	62	22	4	3	1	-	-	-	126
5.Space, Time and Causality	45	29	25	7	2	2	-	2	-	112
6.Connected Wholeness & Fabric	34	16	13	4	-	-	1	-	-	68
7.Philosophy Physical Science Conscious.	60	52	17	13	7	6	5	7	2+7	176
8.Psychology	107	46	11	4	1	1	0	1	3+3	177
9.Gene/DNA	48	15	6	2	2	1	-	-	-	74
10.Cell-Biology	39	14	2	-	-	-	-	-	2+5	62
11.Neuro-Sci Conscious	58	23	13	10	-	2	2	-	1+6	115
12.Evolution Aspects	44	33	14	7	1	1	2	4	1+2	109
13.Nature Ecology Environment	106	50	19	7	3	3	2	3	1+3	197
14.Mind, Consciousness	101	59	16	10	4	1	-	3	1+4	199
15.Spirituality & Mysticism	110	45	19	13	1	2	1	2	1+2	196
Total:	917	529	209	99	34	25	15	22	45	1895