



## STAGE 3

### This is It

The truth speaks within us  
without noise of words.

Thomas à Kempis



**You must help!**

**T**HE TWO GREAT THEORETICAL PILLARS of the twentieth century, relativity and quantum mechanics, both give a crucial central rôle to the notion of the *observer*. In this, philosophical thought has gone full circle.

According to Aristotle, whose views were generally deep enough to accommodate Christian theology, the Earth is a sphere surrounded first by water, then by air and then by fire; the fire showing as stars through holes in a celestial sphere. This view gives mankind a central *privileged* position in the order of things.

This privilege was withdrawn by Copernicus who placed the Sun at the centre. Newton's theory of gravitation and his mechanics both denied a privileged position to any observer anywhere in the universe. Rather the whole was imagined to be being observed by an omnipotent omnipresent omniscient God who by his vision gave all conceivable observables equal ontological status. Hence everything just exists, *quaquaversally*.

By focusing on the comparative experiences of observers in motion with respect to one another, Einstein showed that measurements of lengths in space and durations of time are *not* the universal absolutes supposed by Newton, but are dependant on the relative velocity of the observer with respect to that being observed. In this way, particular characteristics of observers begin once again to play a more central rôle in the theoretical account of phenomena.

In Newton's and Einstein's mechanics, observables are represented by passive *functions* which evolve continuously according to deterministic equations of motion, without reference to the actuality of any observation. In quantum mechanics however, the observable quantities are represented by *operators* that act, when an observation or measurement is made, to transform the mathematical function describing the state of the world into a *different function*. So the observer is thrust onto the stage to act, rather than left in the audience to enjoy, but not partake in, the phenomenal performance of conscious experience.

Giving the observer a special significance in the theory reintroduces the possibility of asking a certain type of question which had become rather meaningless from Newton's objective perspective. We look *out* on the world, *not down*. We are, as it were, embodied inside the world not outside it. We subjectively experience phenomena in our mind through our senses. We do not experience that apparently solid *external* reality either directly or objectively or absolutely.

Newton's mechanical view of the world gives each individual equal ontological status. This is quite foreign to actual experience wherein the *self* is necessarily central. That which is inferred to be, remains in truth just that; an inference. *This* direct subjective existential phenomenal experience is not an inference. *It is all that is not an inference*. This

phenomenal immediate experience *is* the fundamental substance, the basic stuff, the ground of being, the essence. Whether the glow of consciousness is bright or faint, this here and now presence is absolutely *it*.

Questions arise in the mind. Problems manifest themselves. Scientists have considerable faith that solutions can be found, with time and effort; that with appropriate analytic and synthetic thought, and deliberate actions, answers will avail themselves to properly posed questions. We can't necessarily force the answer to be what we might want it to be, but we can arrive at the correct answer to *complete the sense of* any appropriate question.

Questions arise in the mind. They are unfulfilled ideas or *semipropositions*. Eventually answers may arise in the mind, by whatever direct or roundabout route, to make a whole *proposition*. Until they are consciously understood, questions are not questions and answers are not answers.

Problems do not necessarily arise in the mind through the ordinary channels of the five external senses. There are many internal sources of stimuli - for example the sense of thirst and hunger or the sense of fun, of anticipation or timing. Problems reflect unfulfilled phenomenal experience. Problems together with their solutions fulfil the phenomenal experience. This immediate phenomenal world, whatever it might be, is the *source* of all problems and the *source* of all solutions. Therefore this phenomenal world transcends the concepts of 'problem' and 'solution', of 'question' and 'answer'. This essence, which we are aiming to grasp, is not about questions and answers but, as the source of both, transcends them. This phenomenal experience, which is truly the integral totality of all there actually is, is that essence. This is it.

Quantum philosophy, in empathy with existentialism, phenomenology and relative idealism and in sympathy with materialism, logical positivism and pragmatism, reintroduces one to one's soul. This is it.

There is at the quantum level no classical solid outside world. The world centres round the observer who, just by being conscious, is the witness of all that can *conceivably* be real.

Not that theory-laden unknowable noumenal world but *this phenomenal world, whatever it is, is the source of the problem and the source of the solution*. This is it, ultimately the consciousness of the perfect observer; perfect sense through perfect communication; indivisible unity and essential oneness.

### ① Extended Sense: deep understanding

WE COMMUNICATE WITH THE EXTERNAL WORLD using our five *senses*. Sight, hearing and touch may be regarded as physical senses, taste and smell as chemical senses. All these signify domains where our nervous system terminates with *feelers* or *sense organs* such as retinae, ear drums feeding into vestibulocochlear nerves, skin receptors, olfactory nerves and tastebuds. These feelers are designed to capture signals arriving from 'the outside'. The information received by the bodily instruments is sent through the nervous system to the brain and can somehow reach the mind where conscious intelligence makes *sense* of integrated impressions.

In this way for a hundred million years we have gathered data from the world and formulated comprehension, or understanding, or a basic scientific theory, of the nature of external reality. This theory, called *common sense*, seems to us to be the most obvious and indisputable system of facts there could possibly be. For example, the hypothesis that there *is* an outside world at all seems certain to us, although we know that the brain has to construct and constantly update a detailed neurochemical picture and history which is crucial to the maintenance of the common sense perception of that world. Common sense refers not only to practical wisdom derived from millennia of gathering information and assimilating knowledge but also to the common instruments of sense; those outward-reaching organs with which mankind is blessed; the senses we share in common.

From the time when Stone Age Man first made the hand-axe about three million years ago and lit fires about one million years ago, he has begun to change more rapidly and control more precisely his perception of the world, thus developing in an upward spiral ever more sophisticated tools for hand and thought. Verbal understanding of the world has developed to include abstract symbols of art, magic and the supernatural. Around the time of Newton, alchemists were looking for 'the philosopher's stone' to convert base metals into gold or 'the elixir of life' to bestow immortality. In a real sense Rutherford discovered how to turn lead into gold when he split the atomic nucleus. By this means gold actually turns into lead inside large stars. As regards an elixir of life, a clue might lie in the recent discovery that bacterial cells can divide any number of times whereas the cells of higher organisms can only divide about twenty times before the whole organism dies.

An astrological interpretation of personality and destiny and a medicine based on four *humours* made from the elements earth, fire, air and water were part of the common sense of sixteenth century man. It is hard to appreciate just how different and how similar was the mode of thought of generations past, or indeed of different civilisations past and present.

In 1608 the telescope was invented. This allowed Galileo to improve upon the observations of his contemporary, Tycho Brahe, and thus verify the elliptical planetary orbits predicted by Johannes Kepler, Brahe's assistant. Galileo was able to confirm the heliocentric theory of Copernicus which had in fact been propounded much earlier by Aristarchus, around 280BC. This is an historic example of a *forced* change of common sense necessitated as a result of a sophisticated external instrument, the telescope, linked to a human sense organ, the eye, allowing a sense, sight, to be *extended* beyond its normal domain.

In 1609 the microscope was invented. These *extended senses* brought with them an extended consciousness somewhat different from the normal consciousness of the then current everyday common sense. New theories came with the new observational capabilities to give the observations meaning within the new overall world-experience. The observations themselves were only available to those having access to the new specialised equipment, but the resulting new understanding, or system of beliefs and evidence, or scientific theory, or *extended sense*, was less restricted in its circulation. Wood-block printing was invented in China around 800AD and movable-type printing was invented in Europe around 1450. Publishing, which encourages diffusion of new ideas, was already well underway by 1500.

Since the time of Newton and his contemporaries, scientific apparatus has developed from the optical and mechanical, through the electrical and electrochemical, to the microelectronic and computer-based. Eyes have been extended to see, through television, live events hundreds or, by satellite, thousands of miles away. Ears have been extended to allow us to hear, in 1969, Neil Armstrong say "One small step for man, one giant leap for mankind!" while strolling onto the Moon. Computers can reconstruct images of anything from individual elementary particle interactions and metallic surfaces at atomic scales to radio galaxies, pulsars and quasars. Man's senses have been extended more and more until these days hospital staff routinely X-ray bones, monitor heartbeats and brain

waves, look inside arteries and veins, see inside blood cells, scan brains, measure specific hormone levels and even label strands of DNA.

At the same time as observing all these new phenomena with equipment which extends our powers of observation, our mind applies itself to the task of integrating this new information into a unified extended world-view which incorporates and gives meaning to the new, as well as the old, phenomena. New equipment is constructed based on the current world-theory in an upward accumulative spiral of development. Old theories are seldom completely scrapped. They are deepened. Truth is the deepest.

For hundreds of millions of years life developed and perfected onboard instruments, including eyes and ears, and, alongside, constructed a world-map in the brain reflecting the meaning of those received impressions which are naturally interpreted as being from outside the body. This is classical understanding - common sense. Quantum mechanically, if you empirically seek the mechanism of the senses, you will find mechanism. But if you don't then you see no mechanism - just transparent sensations, revealing a complementarity between brain analysis and mental synthesis, between matter and mind.

In the last three hundred years, and particularly in the last fifty years, we have availed ourselves of a vast range of peripheral apparati with which to examine more closely than ever before the minute details of ourselves and our surroundings. Using, as far as possible, rigorous mathematical procedures, scientists have been able to construct elaborate dynamical theories built layer by layer upon the solid foundation of Newton's mechanics. By carefully comparing predictions with evidence they have put aside refuted guesses and further developed observationally confirmed theories. By this rational procedure scientists have built up a vast library store of established knowledge beyond the bounds of everyday common sense and at the same time they have developed a sound mathematical *quantum explanation* of their observations.

### **Blinded by Science**

Most people are not privy to the theoretical edifice behind the gadgetry upon which modern man depends. Most have had their physical senses extended by the use of radios, televisions, computers and other scientific equipment, but they have not had their mental sense, or meaning, sufficiently extended by having the theoretical background to the

construction of this equipment properly explained to them. This imbalance has produced a parlous situation which is exacerbated by the fact that, at least since the time of Maxwell's electromagnetic theory and probably since Newton's calculus, even those who claim to understand the scientific theory rely too heavily on mathematical intuition and too lightly on physical intuition making understanding seem almost impossible to those without very significant mathematical training. In the terminology of Immanuel Kant, mankind is rapidly having his *forms of perception* extended but is not having his *categories of understanding* extended. The man in the street is being bewildered and left behind in a selfish secretive race to power and domination. Instead he should be enlightened in a drive to free the spirit and illuminate the soul.

What would be the social consequence of selling the following three inventions?

First a *no-muscle switch* with which you can switch a switch without moving a muscle! Is *psychokinesis* possible?

The gadget fits into a hat which you wear on your head. Inside the hat are electrodes which connect in a simple and painless way onto your scalp to monitor brain *alpha* waves. Listening to the amplified output you can in fact learn, using biofeedback, to control the alpha wave frequency. Once you have learnt how to control the frequency very precisely, an aerial on the hat can transmit signals which depend on the alpha wave frequency. Thus the lights could be switched on, or the television channel changed, or solenoid-controlled doors opened, just by altering the brain alpha wave frequency. That is, everything could be done at will without the need to move a single muscle in your body. In this way the whole musculo-skeletal system could be dispensed with at the cost of replacing hundreds of millions of years of evolutionary development by a newfangled brain-compatible opto-electronic gimbo. Anyone who would consider undergoing the radical change without understanding how the device is designed and built must already feel that he does not really understand his own body, but that it just works, SOMEHOW. Is this how we ought to feel about our own bodies? Are we getting mentally blinded?

Second comes an *invisibility machine*; a device that can make you disappear at the flick of a switch! Are *ghosts* possible then?

Imagine a tight-fitting all-over body suit. When examined closely this suit can be seen to have a microscopic chessboard pattern on it. The light square dots are microscreens which can emit light. The dark square dots are microcameras which register incoming light. The wiring is so

arranged that a light square dot intensely emits the light which is registered by the dark square dot diagonally opposite it when the suit is being worn. This means that light appears to pass straight through the body making it invisible. When the suit is switched off, or made to emit all pink light, or has been made double sided so it can become transparent, then the wearer will immediately reappear. In this way we could all become an off-the-peg invisible person. This is an example of *retracted senses*. As well as being freed from the 'trappings of appearance', the wearer is freed from immediate responsibility for the consequences of his actions. Such an invention could be a frightening reality, especially for those who do not appreciate how it works.

Third is a *notravel travel machine*. With this machine you can effectively travel huge distances almost instantaneously at the touch of a switch. Is there an *astral body*?

The device requires a large box filled with very light foam rubber and having a large movable ball-bearing on the floor. You enter the box, stand on the middle of the ball bearing, put on headphones and wear glasses consisting of two small flat television screens. At other distant locations are humanoid robots. One particular robot is selected by the turn of a switch in the box. Then, whatever light enters that robot's eyes (cameras), you see in your TV glasses (or better, MASER hologram to video transducers), whatever sound the robot hears through its ears (microphones), you hear in your headphones. When you move your legs, arms or fingers in the sensitised foam rubber, the robot moves identically by remote control. When you walk on the ball-bearing, the robot walks accordingly. Then, to all intents and purposes, *you are* where that robot is. Switch the switch and immediately you are at a different location in another robot's body. If there is not already enough confusion about which characters on TV are real and which are fictitious, then this invention might confuse everyone about who's who and who's where.

If the mighty power of science is given to military generals without at the same time delivering a rapturous amazement at the harmony of nature, then it is impossible for them to deeply understand what they are doing. A monkey can learn to drive a car. *Extended sense* is to be understood as new instrumentation (*senses*) with which to see new phenomena, and *simultaneously* new meaning (*sense*) with which to fully appreciate the new phenomena. One without the other is inadequate. One with the other makes *perfect sense*.

Question: why do we have the sense organs that we do and not telescopic eyes to see for miles or sharply pointed fingers to feel individual molecules? Answer: our instruments were designed to cope with the pressing business of bodily survival and cumulative development. All the senses are perfectly constructed and co-ordinated to utilise most, if not all, of the useful signals reaching the body which would be vital for day to day maintenance and gradual evolution. The brain takes these signals and integrates them into a single whole impression of the state of the outside world. Essential to the process is a theory, or world-view, which gives meaning to, and enables the construction of, this integrated impression.

The similarity between brain processes and scientific apparatus is striking. For example, in large particle accelerators there are large computerised detectors to register and interpret events. Many related events are detected in parallel and then analysed for intensity, distribution and coincidence. The standard physics is applied by transputers to decipher the meaning of the signals. Finally the complete reconstruction is presented on a computer screen as a simulated picture of the underlying event. Similar coincidence detectors have been found in the brain. Parallel neuron wiring has been identified which employs spacial separation to compensate for temporal differences, thus enabling one to identify precise coincidence.

Under normal circumstances, even while employing many sense instruments, one feels comfortable with the agreement between incoming signals and their interpretation by the mind's world-view, or broad theory, or common sense. There is a close and intimate relationship between *sense* understood as material instrumentation and *sense* understood as mental meaning. This material and simultaneous mental pun on the use of the word 'sense' is intentionally employed in order to convey the wholesome notion that, with a comprehensive theory of everything, *one is perfect sense*.

If we had, instead of two eyes, two portable radio telescopes then a deeper common sense theory would have to be developed and installed into the brain. For the purposes of superficial everyday living, this theory would be unnecessarily complicated and the senses would not be easily integrable into a single overall impression because sounds heard with our ears on Earth would not have any obvious bearing on the appearance of distant galaxies. So apparati and theory have to tie together into a unified consistent package for everyday needs, as they seem in fact able to do in all living organisms.



## ② The Perfect Observer: n<sup>th</sup> cousin identity

A WORLD-VIEW IS ASSIMILATED to the evidence viewed. The theoretical understanding one has is therefore likely to be limited by the viewing equipment at one's disposal. Living organisms have equipped themselves with, perhaps, a perfect set of viewing and manipulating apparatus to go with their current theoretical understanding of the 'outside' world. The equipment is perfect in the way that a working television is perfect: it delivers the co-ordinated sound and picture as an integrated whole which is not manifestly lacking unless untuned or broken. From a Newtonian point of view a lot may be totally missing from a TV, like smell, tactility or three dimensionality. But from the *quantum* point of view, precision in one aspect implies great uncertainty in the complementary aspect so that *perfection cannot mean absolute accuracy* or classical exhaustiveness but rather a BALANCED VIEW giving sufficient weight to both or numerous aspects.

A perfect observer is therefore an observer with an appropriate mix of observing equipment, such that the incoming signals are understood perfectly well in terms of the accepted theory and that the range of signals is sufficient to build an optimally coherent impression of the state of the environment. This impression is used in conjunction with the accepted theory to predict the most likely future for the conscious observer. This is the quantum understanding of life. Perfect knowledge is represented by a complete specification of the *quantum*, not classical, state of the system, being or object in question.

*Classical* understanding is different. Therein all material nature is believed to obey deterministic laws. Given a complete description of the state of affairs in terms of positions and velocities of all particles (whose masses must have already been determined exactly) the future can be predicted in terms of positions and velocities exactly. This leads to a very different concept of a perfect observer who knows every conceivable classically knowable thing in absolute detail. This omniscient perfect observer was taken by religious scientists to be the nature of the God of Christianity. On this common view the word 'perfect' becomes practically useless as, almost by definition, nothing can live up to it except God himself. For that reason many will write off this book as soon as they read the title.

On the other hand, the God of Judaism is a perfect observer who accepts the freedom of man to act as he wishes but who can see clearly

into a man's heart and mind and knows his spirit, or disposition. This understanding is closer to the quantum view of a perfect observer than Newton's view because it allows room for meaningful freedom of choice, THE essential requirement for all ethical deliberations.

While undamaged human senses are perfectly designed and constructed and supply information in tune with common sense theory, when the senses are *extended*, the common sense theory sometimes has to be improved because it turns out to be inadequate. Any replacement theory has to be good enough that all available physical extensions supply data which fit comfortably into the theory. A perfect observer is not one who has attached to himself all possible sense extensions. Rather he is one who can correctly interpret observations made by using whatever additional (or subtractional) technological means, if any, is supplied. This means having an appropriately general theoretical framework in place - that is, a deep understanding.

### Quantum Identity

Consider the proposition that the phenomenon of purpleness, that is 'seeing purple', corresponds to an *archetypal idea* which is IDENTICAL for all observers. Or, generally, identical phenomena observed by different observers constitute identical experiences. In quantum philosophy there is a *physical* justification for this claim . . .

Take two fundamental fields of any type; two electrons say. Electronness is defined in terms of mass and a few quantum numbers such as electric charge and lepton number. Every electron will have the same values for these quantities. The only observable differences between any two given electrons are their position, velocity and direction of intrinsic spin. All electrons, in themselves, are identical. If two somehow swapped places, no mark could be made on one to enable an absolute identification of which one it is. This *indistinguishability in quantum principle* leads to observable consequences.

Large numbers of milk bottles, which can be marked and so separately identified at the classical level, obey the usual type of mathematical statistics as expressed by Maxwell and Ludwig Boltzman. However large numbers of electrons, because they are identical in principle, obey a *different type of statistics* discovered by Fermi and Dirac. A third type of statistics, whose discovery is attributed to Satyendra Nath Bose and Einstein, is obeyed by force fields such as photons and gluons.

Fermi-Dirac statistics explains, for example, why atomic orbitals get filled up. Bose-Einstein statistics explains, for example, the spectrum of hot body radiation. It might even be that pounds in the bank are best described by Bose-Einstein statistics too because they are, when in the bank, indistinguishable in principle!

So electrons are not just the same but are *identical*. This claim is verified by the many successes of Fermi-Dirac statistics. That particular type of mathematical statistics follows directly as a result of the electron field satisfying the Dirac equation. Bose-Einstein statistics, on the other hand, is appropriate for fields satisfying the Klein-Gordon equation.

At the foundations of quantum field theory is a mathematical theorem due to Pauli (1955) and G.Lüders (1957) called the CPT theorem. It states that if any quantum field is inverted in space by a *Parity transformation* like a reflection in a mirror, reversed in time by a *Time reversal transformation* like a video played backwards, and is given opposite quantum numbers in a *Charge conjugation* which transforms matter to antimatter, then the result is a field which is mathematically and therefore physically *exactly equivalent* to the original field. Thus an electron moving forwards in time to the left can be considered as being exactly equivalent to a positron moving backwards in time to the right, as when seen in a mirror (which means that its intrinsic spin will be flipped too).

While contemplating this theorem, Feynman realised a consequence which brings out the full force of *identity* amongst quantum fields. He immediately phoned his friend and former tutor John Archibald Wheeler about it. If an electron moving naturally into the future can hit, say, a photon and get scattered backwards in time as a positron, then we *now* might see two particles, an electron and a positron, when from the theoretical perspective only one original particle is required to mathematically explain the phenomenon. If this positron then moves into our past and scatters off another photon in the past becoming an electron moving forwards in time, and if this happens again and again, then all the electrons that we now observe might be explicable theoretically in terms of only one original archetypal electron. Wheeler liked the idea and believed it even more than Feynman himself. Wheeler suggested that there are more electrons than positrons in the world because the positrons come back through the charge on protons.

This quantum parable makes conceivable for the first time the exceedingly economical notion that there need be only *one* electron in the

entire universe. That certainly accounts for their identity. More than that, if there is only one electron in the universe then things which were once regarded as absolutely distinct become intimately and inextricably associated. For example, your brain and my brain are composed of electrons - *the very same electron*. Therefore there is a quantum physical basis for asserting that purpleness might be an identical experience for us all.

Indeed, only *one of each type* of field - quark, photon, Z, ... - is quantum theoretically absolutely necessary. When a satisfactory theory of everything is found then there will probably be *only one type* of field. Therefore there would only need to be one field in the universe. This makes us all much more identical to one-another than we might have imagined, or wished.

The more complex a composite object is, the more chance there is that two of them will be in differentiable states. But still the identity between like constituents has consequence. Atomic nuclei with an *even* number of protons plus neutrons obey Bose-Einstein statistics while nuclei with an odd number of protons plus neutrons obey Fermi-Dirac statistics. By the time the level of complexity is very high the consequences of identity become more subtle. Nevertheless two benzene molecules are, in some real sense, identical and therefore one. Likewise two milk bottles, or indeed two buckets of milk, have an underlying theoretical inextricable identity unappreciated by the more superficial Maxwell-Boltzman statistics. The more alike two things are, the more manifest identity they share. Two brains share a lot more of this physical identity than a cricket ball and a tennis ball. The surface of the Sun is more water than cheese, the surface of the Moon is more cheese than water! This is not classical sameness but identity we are comparing; elementary constitution, hydrogenness and carbonness for example.

Identical twins have a lot of this *quantum identity*. If they have similar ideas and similar trains of thought, which apparently they can do, then there is some justification in quantum field theory for arguing that these parallel thoughts are *one and the same* thought. Carl Jung around 1948 had a theory of mind in which thoughts are built from elementary *archetypal* ideas. These ideas are profoundly common to all humans, the circle being one powerful example. Ludwig Wittgenstein in 1921 presented his theory of logical atomism in which the world is said to be made up of atomic facts which cannot be further analysed. In the ancient Hindu Vedas, thought is considered as whirlpools of force. Mindstuff is

supposed to be made of a subtle material called *chitta* in which waves, or *vrittis*, ebb and flow. But beyond that is the soul, Atman, which is ultimately identical to the supreme soul, Brahman. In all these theories of mind, purpleness is, in essence, quantum identical for all purple experiences by all individuals.

## Quantum Numerology

The predictions of quantum theories are given, as shown by Born, in terms of the mathematical modulus of the state function. The state function results in a *complex* quantity which has both real and imaginary numerical parts. What is an imaginary number? One cannot point to an example set as one can with a real number. An imaginary number is so called because it is even more of a Platonic ideal than a real number is, quantifying ideas about numbers rather than real elements. The *modulus* function combines real and imaginary parts of a complex number into a real part only. This real part is invoked in the description of the world when formulating quantum propositions which can be directly tested. When the full meaning of quantum philosophy is uncovered, the real part of the wave function may have some direct reference to the observed phenomenon while the imaginary part may have some direct reference to the unobserved noumenon. By taking the modulus, only phenomena are described. This would not imply a return to determinism, but rather a unified mathematical description of mind-matter essence.

Here is another quantum parable which may help us to appreciate the mighty form of the new paradigm. In the everyday world one can represent a positive number by that number of physical *counters*. We can add to the number or subtract from the number as long as the result is zero or positive. Question: how can we represent negative numbers? Answer: antimatter! Taking one counter from zero counters (which requires the power of many nuclear bombs) leaves one (negative energy) anticounter. This anticounter is real enough. It can be seen. It reflects light. But in our world of predominantly matter, antimatter, unless carefully suspended in vacuum, violently annihilates with the surrounding matter almost immediately. We can theoretically take away another counter and get two anticounters, literally *minus two* counters. And we can add two material counters to get zero counters again. Thus *all* the integers have physical manifestation in quantum numerology. Fractions just involve division of

counters or anticounters. Irrational numbers, particularly transcendental numbers like  $\pi$ , remain to be scientifically interpreted.

In special relativity there are, theoretically, three different manifestations of particle: there are *tardyons* which travel slower than the speed of light, there are *luxons* which travel at the speed of light, and there are *tachyons* which travel faster than the speed of light. Tachyons are usually ignored in physics as they have imaginary mass. However they are treated seriously in string theory, although only as a nuisance which has to be eliminated. By interpreting imaginary properties as referring to unobserved imagined noumenal stuff, could tachyons help us to understand anything? Think of Jupiter. If it took less than half an hour then your mind got there faster than the speed of light, so to speak. Now try to take half an hour to think of Jupiter. That seems impossible. Thoughts like that *can't* move slowly.

Consider that the properties of material objects are associated with real numbers and that the properties of thoughts are associated with imaginary numbers. Minkowski argued that Pythagoras' theorem could usefully be extended to four dimensions if the fourth dimension was taken to consist of imaginary numbers. In particular, time and energy seem appropriately represented as imaginary dimensions. Making time and energy imaginary numbers in the uncertainty principle changes the sign of the product and hence the direction of the inequality. The time-energy uncertainty principle becomes a sort of *certainty principle* for mental properties. It becomes the statement that the product of the uncertainty in the time of an event multiplied by the uncertainty in the energy of an event is *less than or equal to* minus Planck's constant. Particles with properties obeying this type of certainty principle we might call *sophons* while those obeying the usual uncertainty principle we might call *megons*. Perhaps *sophons* originate in a *principle of most action* while *megons* originate, as they do, from a principle of least action.

When both real and imaginary properties are involved, as is envisaged in a quaternionic theory, quantum description might be yet more revealing, perhaps providing a detailed mathematical explanation of the relationship between mind and matter. Descartes, the founder of modern Western philosophy, when viewing a table, considered there to be one material table and another table 'in the mind', contingently identical. The full quantum theory of *sophons* and *megons* could herald Cartesian monism, or a lifting of the Vedic *māyā*, the illusion by which one appears as many.

The perfect observer is in full possession of a comprehensive and comprehensible theory of everything which causally accounts for any observation he may care to make using whatever equipment. Say he meets another perfect observer. They both realise that their sense data are at root identical and that their interpretation of that data is one and the same - THE unified idea. They fully appreciate the identity between them. Are they two observers or one? As the signals from two eyes or ears merge through two halves of one brain to become one unified picture or impression, so there is only one perfect observer, *looking out* on the world, not down. What was disparagingly called solipsism becomes the warm embodiment of the perfect observer. *One is the perfect observer when the unified theory of everything becomes self-evident.*

The logical conclusion of Darwin's observations is that all of life, from plants to man, originated four thousand million years ago all from the very same source, some blue-green algae, or whatever. Now, *first cousins* have common grandparents, *second cousins* have common great grandparents, *third cousins* have common great great grandparents, and so on. A person being one generation away from a first cousin relationship makes a relationship of first cousin *once removed*, either up a generation or down. Two generations away would be first cousin *twice removed*, either positive (up) or negative (down). Thus the relationship between anybody and anybody else can be significantly expressed by just *two numbers*, one positive number ( $n^{\text{th}}$  cousin) and one integer (generations removed). The magnitudes of these numbers statistically represent the degree of genetic identity between two individuals. Zero and zero for brothers and sisters up to, say, one thousand and zero for contemporary strangers on different continents.

There is a deep identity amongst all living beings from animals to plants. Something like 98% of a monkey's genes are identical to human genes. This identity binds us all together into a quantum mechanical whole much deeper than the superficial 'sameness' granted by classical understanding. Perhaps it is easiest for identical twins to understand the oneness of the perfect observer who is in undeluded truth us each and all.

### ③ Unity Consciousness: transcending the loop

THE PERFECT OBSERVER KNOWS AND UNDERSTANDS the theory of everything so thoroughly that any observation he may choose to make fits harmoniously into his scheme of things. To him the explanation behind every phenomenon is self-evident in terms of causal propagation of some sort of *square root of probability*, whatever that means. What had started as a somewhat abstract mathematical theory allowing accurate prediction of specific outcomes in contrived experimental circumstances becomes, for the perfect observer who has reprogrammed his brain, a new common sense, appreciated as intuitively and as directly as a fist on a brick.

To become so familiar with the theory, that the extended sense of it, which was originally paradoxical and repulsive in the old local deterministic paradigm, becomes obvious, natural and deeply satisfying, is the goal pursued by the genuine mystical scientist. How is it possible and what does it mean?

### Perfect Language

We are so attached to our mother tongue that we don't often wonder how well we could communicate and how effectively we could think without ordinary language. At school we learn grammar, but before we go to school we have already learnt to understand and speak words, phrases and sentences of our native language. In the very early years of life neurons are still *visibly* growing and making physical connections with one another inside the brain, especially in response to external stimuli. In this formative period not only is learning taking place in the mind, reflected in a physical RNA memory within nerve cell nuclei, but also brain construction by neuron connection is taking place, especially when stimulated by rich external environments. That construction mirrors the associations made in response to conscious experiences which are, to a large extent, themselves already portrayed in language.

Before we can begin to read words we ought, logically, to learn the phonetic alphabet. Reading English is then just a matter of enunciating the phonemes in order of their appearance on a linear basis. A number of special cases require one to look ahead two characters(as in *sh ph th ch wh oo ee ei ie ai ae ea qu ps pn ge ng*), three (as in *ate ide ure uni igh ike ome tio*) or even four characters(as in *ough eigh augh*) in order to identify the

correct phonetic pronunciation. In English, the flow is strictly linear most of the time. The biggest problem is with the vowels *a, e, i, o, u*. Each of these can assume three or four different sounds depending on the context. These vowels are well integrated into our thinking. Recent observations have shown that, at a very early stage in our lives, vowels have been singled out by the brain for special treatment. There is a clinical case where damage to the left side of someone's brain selectively impaired his writing of vowels. All the consonants were completely unaffected. This exemplifies the level of detail at which the brain analyses, sorts and stores information about language of which we are, by age four, hardly conscious and must formally relearn about at school. Reading out loud is another example of the accuracy, intensity and grace with which the brain can decipher from symbols to phonemes to words to sentences, in real time co-ordination with eyes tongue and lips, paragraph after paragraph of ideas, scenes and stories. *Ordinary language mirrors brain function which maps the world.*

Studying pure mathematics is like studying Sanskrit grammar with the minimum vocabulary. It is dry and strict and can appear cold, dead and repelling. But mathematics seems to form the syntax of the language of nature and as such is exciting, revealing and penetrating. How many is two lots of two things? Four things! It's obvious. How many is two hundred and thirty seven lots of fifty nine things? Not so obvious, but demonstrably thirteen thousand nine hundred and eighty three with patience and understanding. Given the extended sense of a calculator the right answer is easily found.

Mathematics is a language of common *and* uncommon sense. Mathematical thinking is potentially applicable to any well-defined domain. The phenomenal world is the ultimate domain for applied mathematics because it is the originator of all meaningful concepts. Therefore quantitative science adopts mathematics, the most precise language available to date. Arithmetic is virile in calculators and traditional computer languages like C or APL, but mathematics is especially potent in the form of a computer algebra system such as MATHEMATICA because of its rigorous pre-digested general mode of communication. Likewise Sanskrit is animated in a Sanskrit speaker.

Mathematics provides the syntax in the form of necessary equations and relations, with their sound justification and clear general significance. Science provides the semantics in the form of a dictionary of concepts

having operational and intuitive meanings. Together, as a philological whole, they express the meaning of our world.

Mathematics is very like ordinary language. Numbers behave like nouns, they are the Platonic things with which one deals. Functions act like verbs, having a noun subject and maybe a noun object on which to act, as for example the plus in  $1+1$ . Operators, such as the integral and differential operators, which modify functions to give other functions, are like adverbs which modify verbs. Theorems relating numbers, functions and operators invoke syntactic rules relating these nouns, verbs and adverbs. Mathematics propounds many precise theorems, or justifiable propositions, relating nouns, verbs and adverbs. Probably all parts of speech have an analogous symbolic rôle in some branch of mathematics. That mathematics is a well-defined language which can be encapsulated in computer software is also very significant and provocative. For computer programmers, mathematics might seem to be much easier to program as artificial intelligence than ordinary language but this is to some extent an illusion since computers are geared to binary numbers by design and only elementary mathematics is normally being considered in the comparison.

The mathematician defines his abstract territory and constructs his provable theorems. Everything is clear in his mind and is well understood. The scientist takes these theorems and applies them to his own particular concepts, calling the result a theory about the nature of the world. The theory can sometimes be used to make predictions which can be tested. If the predictions are verified by observation then the theory can be considered to contain an element of truth about the world. Before the scientist can claim to truly *understand* the theory he must have an intuitive understanding of the original mathematical theorems as well as the scientific concepts with which the theory deals.

Could we program the linguistic structure behind a theory of everything into our brains so effectively that thinking in its terms is figuratively as easy as 1 2 3? The standard model of physics is so computationally unwieldy that this is probably impossible for reasonable speed of thought. But mathematical science, in just three hundred years, has managed to reduce almost everything fundamental in the physical world to a single page of mathematical expressions. Hopefully mankind has plenty of time to improve on this. Imagine that some theory, like string theory or the quantum theory of associative lumps, is shown to fit all the available facts. And suppose that the conceptual difficulties behind the need for renormalization of any quantum field theory are removed,

obviated or somehow conquered. Could the enormous paradigm shift involved in digesting this new explanation actually be reflected in a physical cell to cell rewiring of brain neurons, or do we have to wait for generations of evolution to make the necessary transformation before paradoxes become paradigms and incredulity becomes understanding? Should we be satisfied with equipment which translates quantum events into comfortably familiar classical situations, or should we search for real understanding behind superconductivity or superfluidity or supergravity and seek wisdom through that understanding? From an ultimate theory one has the right to expect *ultimate wisdom*.

Physics is fundamentally based on pure clean quantifiable measurable notions. Mathematics is based on clear precise definitions and well-defined relationships. Computers can interpret many mathematical statements and make exact numerical or even functional predictions, very quickly in many cases. Some people can apparently perform amazingly difficult mental arithmetic very quickly too. Why could we not learn to reckon quickly and accurately by programming our responses according to Euclid's algorithm or rather Euclid's *insight*, for example?

Blinking is a fast programmed response. Digesting food is another programmed response. Walking or driving a car is a learnt programmed response. Protein synthesis by genes is a deep programmed response. The fifty thousand or so genes in DNA seem to be the program of life itself. So why can't we imitate the arithmetic and logical unit of a single silicon chip? Of course we could. Somehow. One day. One day the volume under a two dimensional surface function could be intuitively estimated to great accuracy using a procedure based on the insights of integral calculus or functional analysis. After all, every electron, in some analog sense, quantum electro-dynamically 'calculates' almost instantaneously. As fourth and fifth generation computer languages refine, simplify and generalise algorithms, procedures and notations, so the way to achieve true intuitive understanding of scientific theories will dawn and start to shed light turning mysterious mathematical incantations into completely transparent self-evident quantum supertruths and manifestly sound quantum supervalid arguments. After all, mathematical science is very young on evolutionary timescales.

The language, which one employs to think colloquially and communicate abstractly with others, reflects one's level of consciousness. Society as a whole, particularly since the advent of television and 'the media', reflects an average level of consciousness which it is very hard for

an individual to break out of, or dissociate from. This *psychic atmosphere* controls the paradigm of understanding. There is little acknowledgement of the possibility of an entirely new paradigm and therefore very little encouragement to change fundamental ideas. But the world is changing rapidly causing more turmoil and hardship than wealth and happiness, and yet some elementary ideas originated by ancient Greek philosophers are still held fast while the ideas of quantum philosophy are almost entirely ignored. Drop your lunch on the floor and we all know how to clean up the mess, but put a false idea into the mind and sometimes, because of lethargy, habit or comfort, it is impossible to remove. We know how to manipulate things external, but for the most part we are not in control of the flow of even our very own thoughts.

So what does the perfect observer think? What language does he use? What does he aim to DO with his life? The language will be that appropriate to the set of intuitions surrounding his theory of everything, with particular bias towards those instruments, extended or innate, with which he habitually operates. His language will probably be of a terse symbolic mathematical form, although ordinary language will necessarily be encompassed as the mode acceptable in certain limited circumstances where low-level reduced or high-level consolidated understanding is the only communicable form. The thoughts of the perfect observer will involve some remembering of the past, some enjoyment of the present and some weighing of the future. But with far more clarity, involvement and vision. The aim of his life must be to share his insight so that the whole world can achieve spontaneous total harmonious ecstasy.

### **Self-Evident Supertruth**

The perfect observer does not habitually function in the arena of questions and answers. He totally understands a theory which quantum philosophically explains absolutely everything. When a problem presents itself, the solution is immediately transparently obvious. He therefore moves straight into action to recover any lost harmony. If he meets anybody who is 'not himself' then the perfect observer attempts to communicate his supertruth. He does not deal in semipropositions, in questions or answers, but in quantum inseparable wholes and in complete unequivocal propositions. He listens, explains, proclaims, directs and loves. His quantum ignorance still leaves him invincible. When he becomes aware of classical ignorance a subtle quizzical extended or innate

observation supplies the necessary information for perfect understanding. The perfect observer is thus a being without classical ignorance. Should a new baby be accused of gross ignorance? No, it is quantum ignorance for which there is no rebuke because quantum ignorance is theoretically necessary and totally rational, and therefore blameless and beyond disdain.

Unity consciousness is the state of mind of the perfect observer who deeply, down to rock bottom, understands this phenomenal world of pure experience. His theory of everything constantly confirms the unity of it. Scientific reductionism allows him to apply his theory to physical, chemical and biological levels of complexity with relative impunity. As it stands at the moment, quantum theory is a predictor. It accepts information from observing equipment and gives a description of possible experience to come. When the full meaning of the wave function, a sort of square root of probability whatever that is, is understood then quantum theory will be more than just a predictive algorithm. The perfect observer, appreciating the full meaning of quantum philosophy, experiences *loopless itness* which transcends problems and solutions, questions and answers. *The theory of everything is a representation of the consciousness of the perfect observer.*

If you meet a perfect observer and talk with them then the more you understand what he/she is saying the more you will become yourself and the more you will become him/her too. He does not take away your self-identity. He strengthens it because you come to realise what you already actually know intellectually, namely that you are absolutely different from and at the same time almost identical to everything else, including monkeys, trees and rocks. The personality is not limited by quantum revelations. It is *harmonized, crystallized and unified*. Thus you become more recognisable, more tangible and more comprehensible. Finding out about the external world is finding out about yourself. The world is the shadow of your potential. You already intuitively know there is only one true observer, and he looks out.

There may be *only one type* of particle in the ultimate theory. There may be *only one particle* in the universe. Therefore, in so far as consciousness is somehow associated with matter, there need be only *one source of consciousness*. Therefore there need be only one observer. One is the perfect observer when one fully comprehends, understands and appreciates what all this means. Then you can interpret THIS ITNESS as perfection.

## UNITY CONSCIOUSNESS AND THE PERFECT OBSERVER

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The perfect observer may begin as a solipsist. However, when he communicates with others he will partially and confusedly identify with their state of mind. If and when the confusion is resolved, he will recognise their mind as his own. Quantum communication, or oneness in interaction, unites subject and object, observing instrument and observed object, into an indivisible unanalysable inseparable whole. Two people who are communicating form an entangled bond which can become so intimate that they become truly inseparable even when apart. *Love is perfect communication.*

This phenomenal world, the integral sum of all durable experience, is everything that has to be explained. When it is understood, everything is understood. Such understanding *is* possible.





