DUPLICATION THEORY

An explanation in principle for the operation of memory and other allied phenomena

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Abstract

This paper presents an explanation of how information can be transferred across time, and also space, by analysis the nature of form, order and structure. The first part of the paper shows how transfer of information is closely connected to near absolute randomicity with the result that systems of near perfect similarity will have an increasing potential to resonate with each other both across time. The detail of this mechanism is explained in terms of principles of physics and observation, and it is shown to be a self-ordering tendency which acts to counter that of entropy. The hypothesis, referred to as Duplication Theory for convenience, is split into two sections. The first part can be defined very briefly as "Equal intervals in space -similar structures- tend to duplicate themselves through all time in the same location" which is effectively the corollary of the second part: "Equal intervals in time -similar actions- tend to duplicate themselves through all space at one moment in time." This second part shows how information is transferred through space simultaneously, and which is familiar as Electromagnetic radiation.

Part 1. Singularities exist in different forms and are referred to generally as singularity states, the recognition and classification of which have come to play an important role in physics. Whenever one is recognised and investigated, another area of understanding is revealed. Examples are the way that relativistic physics was based on the absolute velocity of light; the impossibility of reaching absolute zero of temperature, and the perfect impenetrability of matter. Although they cannot be achieved, close approaches to singularity states can be made with the result that the rules of nature as they were formerly understood suddenly need to be revised.

It is impossible for one structure of particles in motion to ever be perfectly duplicated by another similar structure at the same or at different times.

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This is partly as results of Heisenberg's Uncertainty Principle, and accords to the definition of singularity state since it can never be attained. However it is possible for close approaches to be made to perfect structure duplication, and when this occurs so that the two different identities are very close to becoming the same object, they will start to resonate. This resonance is explained as being a direct equivalent to the familiar process whereby two protons of hydrogen can be fused together to convert into one of helium, with a small element of their combined mass, being converted to radiation energy. The reason there cannot be perfect fusion is a side effect of the Uncertainty Principle as is the reason that two structures can never be perfect duplicates of each other. The two effects are directly equivalent and as two similar structures approach the singularity state of perfect duplication there will be an increasing potential for the mass of one structure, presumably that later in time, to start to convert to radiation, which never occurs since the composite particles of the earlier structure are in motion and the later structure, according to the minimum energy principle, will move to duplicate the motion of the earlier.

This principle is applied to the brain as an example of billions of neurons firing in a highly ordered manner to create visual images of the external world and also rational thought. This must involve highly ordered microstructures and an assumption is made that the resulting electrochemical currents create EM interference patterns beyond the brain which are viewed as holographic images replicating external reality. If a specific structure created by firing neurons at an earlier time is duplicated and introduced later into the same brain cells, and if there is no other data coming in through the senses to disturb the process, the later neurons will fire in such a way to duplicate the sequence of earlier visual images and thoughts.

Such an effect is remarkably similar to what can be observed from subjects in hypnotic trance when they are instructed to relive some previous sequence of events from their earlier existence, and the assumption is made that in deep trance, neurons in the brain are firing in near perfect randomicity. It is conjectured that this process is the basis of eidetic memory or perfect recall, and that working memory consists of a telescoping of much reduced sequences of such memory flows, with each sequence instigated by a source of information stored physically somewhere in the brain, probably in a similar form to that exercised by DNA molecules.

Part 2. An alternating current is a repetition of the actions of billions of identical electrons with identical charge, passing back and forth past one location at identical intervals of time, giving rise a number of degrees of duplication. These can be defined as singularity states in that the actions of one electron can never be perfectly duplicated by another, but close approaches can be made, for which ex hypothesi, it might be anticipated that rules of nature as they were formerly familiar, need to be revised due to anomalous new effects. This happened when force at a distance was first demonstrated by Faraday's experiments, so that Maxwell was later able to qualify these observations with his field theory of electromagnetism. It is proposed that electromagnetism could be defined in terms of Duplication theory as follows:

"Equal intervals in time -similar events- tend to duplicate themselves through all space at one time." This interpretation of the way EM action is transmitted without the photon serves to reinforce the first definition of structure resonance in that the words time and space are interchangeable in each without losing meaning, so that one is a precise the corollary of the other. Further qualification of this way of defining EM radiation is given by applications of the theory to well-known phenomena.

Applications of both parts of the theory are given to show they might apply to various phenomena including memory, intuition, consciousness, probability and symmetry, quantum entanglement and inertia.

Keywords: *similar structures and events, singularity state, uncertainty, resonance, holographic image, randomicity*

Introduction

Duplication theory postulates that similar structures resonate through time and that there is also a corollary effect that similar actions resonate simultaneously through space, and this is explained in terms of principles of physics. It was deduced in a period of voluntary absence of two years from office life in the West End of London as a commercial development surveyor. It was resolved entirely from observation and a fair amount of random study of anything that caught my attention during about 18 months residence in the old reading room of the British Museum in the late 1970s, now alas converted into an exhibition centre. As a student in the mid-1960s studying law I had seen a stage hypnotist at work and was impressed by the extraordinary capabilities of people, who when under hypnotic trance, were capable of re-experiencing episodes in their past in apparently perfect detail. One of the subjects I

covered in the reading room was hypnosis and the trance state, which reinforced my assumption that such powers of memory could not physically be stored in the brain: there had to be some external process involved. This initially prompted the possibilities of an explanation based on resonance.

Copies of an early roughly drafted paper were sent to a few luminaries at the time including Arthur Koestler, and John Beloff (founder of the KPU unit of Edinburgh University). Koestler recommended I should write to David Bohm since my proposals were similar in many respects to his. Little came of this, although Beloff continued to be encouraging. Nothing transpired for another few years until I read Rupert Sheldrake's first book in 1983, after which I met him and we have been in regular contact ever since, and I started to take my hypothesis a little more seriously. My hypothesis is not based on experimental work or formal academic studies, and although it was originally a fascination with ESP that drew me into attempted explanations for precognition and telepathy, I decided to delete most references to such topics in my later work. As I wished to be taken seriously by the physicists, I concentrated instead on the operation of memory since nobody can deny its existence, with the added attraction of it being a tabula rasa: nothing is known about its basic mechanism. Most members of the physics community are categorically deterred by any mention of ESP so after 2009 I have excised descriptions of how my theory applies to some aspects of ESP from web site. However a theory which shows how information is transferred over time must immediately appear relevant to the paranormal.

The theory shows how and why it is impossible to have two perfectly similar structures in the universe either simultaneously or at different times. It then postulates that this occurs due to the same reasons that two particles cannot occupy the same space simultaneously: that the impermeability of matter is directly equivalent to the statement that there can never be two identical structures in the universe. Perfect fusion of matter and perfect structure duplication are both equivalent singularities, and equally unattainable. However, close approaches can be made to singularity states, as in nuclear fusion when matter converts to radiation energy. It is then posited that there is an equivalent potential for energy release from matter conversion when structures identical to the point of near singularity start to interact or resonate across time and space.

A number of basic statements of principles or observations will first be listed with some subjective interpretations. These will be combined, making certain assumptions, to deduce the theory and then its application to various phenomena will be described. Since no experimental work was carried out, I often lapse into the first person singular rather than the passive sense in order to explain the development of the theory, which seems to me clearer in explanation in a part narrative account of

how the various observations were made and combined, it being a speculative and subjective exercise. I refer to my work as Duplication Theory for brevity and convenience, although it is more accurately a hypothesis, which shows how there is a principle of self-organisation, what Schrodinger described as 'order from order', to counter the effect of its opposite tendency, entropy.

Observations and statements of principles used as a basis of explanation

1. All energy in the form of rest mass exhibits a tendency to coalesce together: gravitation.

2. All energy in its unstructured state of radiation disperses in all directions at the absolute velocity of light. This leads to the second law of thermodynamics that entropy always increases, so that systems tend to run down and become more random.

3. All systems tend to their most stable state, that containing the least energy. This is the basis of the minimum energy principle, although it can be expressed in varying forms.

4. Singularities have become established, and will be referred to in this paper generally as singularity states. The recognition, classification and investigation of singularity states have come to play an important role in the way physics progresses. Whenever one is ascertained and investigated, another area of understanding is revealed. For instance, Euclidean geometry depends on the singular definition of parallel lines meeting at infinity; Newtonian physics on the assumption that energy can never be destroyed; relativistic physics on the singular velocity of light. Possibly another field of fusion physics will be disclosed on learning more about the existence of black holes. It is observed that although singularity states cannot be attained, close approaches can be made, and current laws of nature always have to be altered and modified to accommodate novel unfamiliar effects that are produced on the recognition of a hitherto unanticipated singularity state.

5. All particles are in constant motion and can never be made absolutely stationary except theoretically at the singularity state of absolute zero temperature.

6. Heisenberg's Uncertainty Principle states that a particle may have position or it may have velocity (momentum), but it in any exact sense it cannot have both. It can be alternatively stated as follows: Because very small elementary particles

move very fast in relation to their dimensions, and are never stationary (5), it is impossible for an observer ever to be sure of their precise location. One reason for this, apart from the signal to the observer interfering with the motion of the particle, is that by the time that the light from the particle has reached the observer across astronomical distances relative to the particle's dimensions, it will have moved into a new location whose whereabouts cannot be accurately predicted.

7. Two particles cannot occupy the same location at the same time, although close approaches can be made to this singularity state. This has little to do with any physical notions we may have of solidity from sense of touch. It concerns more the fact from 6, that if the location of one particle is always uncertain, then we can never be sure that two particles are occupying the same space simultaneously. This is equivalent to saying these two particles can never occupy the one location at the same time, and to be consistent, then neither can one of the particles ever occupy that same space at any other time. This is for the same reason that one can never be certain of the location of any particle in motion. A brief elaboration of this nice point follows: Einstein showed that although a particle could travel very close to light velocity, it was an unattainable singularity state. Matter travelling at light speed could never be detected since no signal could ever be transmitted that would ever reach any observer: if something is incapable of detection, it is the same thing as saying it can never happen: the rationale in 6.

8. The concept of geometrical structure is fundamentally based on the perception of the repetition or duplication of equal intervals in space, or harmonics of such intervals. Elaborating briefly, there is no structure in a particle system in random motion (a gas cloud) but when a number of composite particles arrange themselves at equal intervals within the system, then pattern will become perceivable, and with the imposition of order, structure becomes apparent. It is the near singularity of duplication of equal intervals that creates perceivable structure out of indecipherable chaos.

Combination of the above eight observations

A. A structure can be precisely described mathematically as the spatial relationship between its component particles. From 6 we can never be sure of the precise location of any of these particles with respect to each other, so that it must be impossible to produce a perfect duplicate of one structure with another, either simultaneously or at any other time. Perfect duplication of structure is a singularity state.

B. The singularity of perfect fusion mentioned in 7 and perfect structure duplication are both the result of Heisenberg's uncertainty principle (6). It might be reasonable to anticipate that close approaches to both singularity states might tend to produce similar results, springing as they do from the same cause. Ignoring the detailed mechanics of the transaction, two hydrogen nuclei, when compressed together, tend increasingly to occupy the same location, in spite of their electrostatic repulsion. The end result is that beyond a certain limit of pressure, they suddenly fuse closer together, transforming into the more stable element helium, releasing as radiation energy some of the separate particles' rest mass not required for binding the structure together. This paper maintains that, similarly, as two structures approach perfect duplication they will tend to interact so that a small percentage of the rest mass of the later in time will demonstrate an increasing potential to convert to radiation. Such near identical structures never disintegrate this way because no structure remains stationary (6) to allow duplication to be sustained long enough to convert. In anything less than perfect circumstances, only the potential to convert is realised. The composite particles of the later structure continue to duplicate the ensuing action of the earlier moving structure in accordance with the minimum energy principle (3). In other words, the later structure will alter to minimise the energy of the rest mass of its composite particles, by moving to such new locations that will increase their potential to convert to radiation energy. This will only occur if there are no external circumstances and forces at play to interfere with the otherwise random movement of the particles surrounding the two separate structures.

C. The resonance effect is assumed to be additive so that it will increase with the degree of complexity of the original structure duplicated. The greater the repetition of equal spatial intervals, or the more structured an object is, the greater resonance potential it will possess.

D. From B the action of any later structure in time in the same location will resonate with an earlier structure's action. The 'same' location is not meant in absolute terms in space, but the same relative to its immediate surroundings. If a particle structure exists within a vast number of similar surrounding particles in random motion, then if a similar structure is precipitated within another similar particle system also in random motion, but at another time and place, this is effectively the 'same' location as far as the structure is concerned, relative to its surroundings on the same scale.

E. If not exposed to forces of external perturbation, molecules in a gas cloud move in nearly perfect random motion. If the motion were perfectly random, then it would be perfectly ordered since every particle would then be at equal distances apart,

and their motion would have to be identical. This never happens in nature, since perfect randomicity is another singularity state, and close approaches are rarely observed. One of the reasons for this is that all mass is affected by gravitational fields of other masses nearby whose forces will disrupt the perfect random motion of a system. However, should a system somehow avoid perturbations of the fluctuating gravitational field and closely approach perfect random motion, it might be anticipated from 8 that extraordinary phenomena might result. One means of reducing gravitational fluctuations would be to surround a structure with a large system in random motion, provided the components of the structure were similar to those of the structure. The large numbers of surrounding randomly moving particles would have a blanketing effect to smooth out distortions in gravitation caused by large masses nearby. Again, if the composite particles of the structure were of minimal rest mass, say electrons, gravitational fluctuations would be less disruptive to their free random motion, than if they were massive. Diagrams 1,2 & 3 below are set out to illustrate increasing order from randomicity.

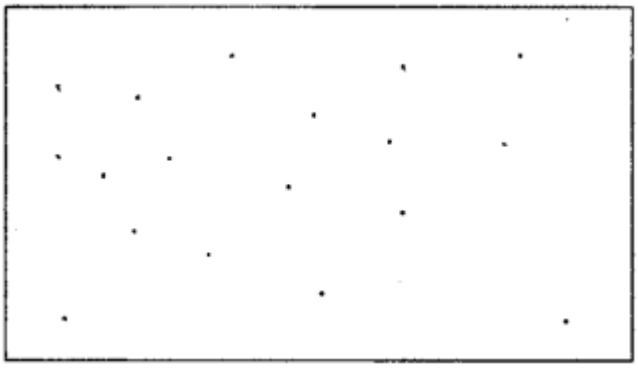

Diagram 1 *– Very few gas molecules in irregular motion at varying velocities apart. No degree of perceivable order and pattern at all*

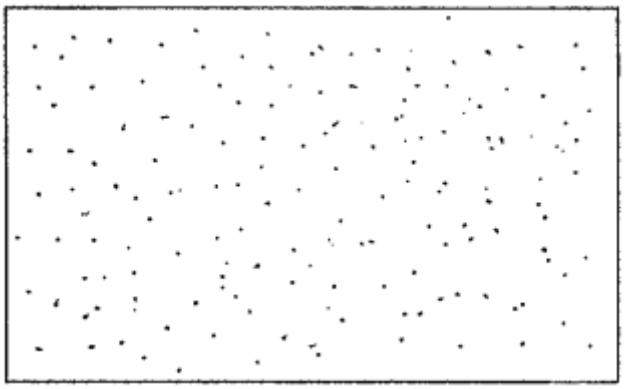

Diagram 2 *– Greater number of gas molecules in same volume. Greater degree of uniformity of distances apart and velocities of molecules*

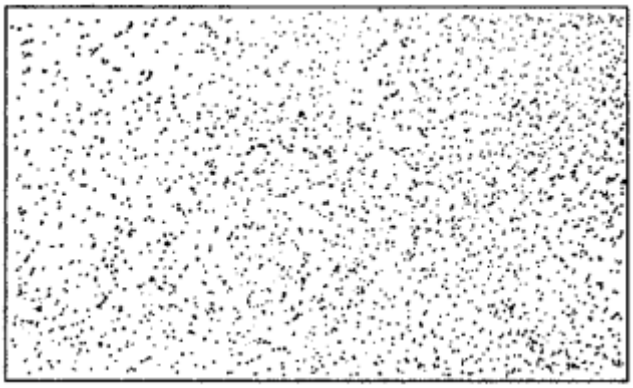

Diagram 3 – Great numbers of molecules in same volume, all in motion, which will be at similar velocities and the spacing between molecules, will be very similar. As the pressure of the gas increases, so will the complexity of the contained structure of its component molecules increase, as will their order and pattern.

F. Ilya Prigogine won a Nobel Prize for showing that as a system's state of disorder was accelerated, that system became self-ordering. From 8, the concept of order and its perception is based on the duplication of equal intervals in space, so that when random motion is near perfection and singularity, the resulting self-ordering manifests itself as an increasing potential to duplicate any other structure in the universe. This is because the most perfect form of order is a perfect duplicate of an existing structure. If a specific particular structure were to somehow be inserted into an otherwise random system, then that structure will automatically move to duplicate the structure in the external universe that it most resembles.

G. One of the finest examples of an intensely complex system onto which order might be imposed is the brain, in the form of billions of neurons interconnected through the firing of neurons, to give unceasing motion of electrochemical impulses. An assumption is made that rational thought must impose pattern and order on these firings, but in the trance state, with all external information from the senses excluded, then because the neurons never stop firing, they will be doing so randomly in that part of the brain controlling consciousness. Structures of electrical impulses with negligible rest mass will be little affected by fluctuations in gravitation. If it is further assumed that in deep trance, with no interference from the external world via the senses, the brain's activity will be near singular randomicity. From F, it will have the ability to duplicate any other former neuron pattern or memory perfectly, given the appropriate instigatory initial structure, in the form of a single thought. Perfect recall is fond to occur whilst some subjects are in trance state, which could be self-induced but more usually hypnotically. This would present a possible answer to the apparent ability of sensitives to relive or duplicate sequences in the lives of others, both past and possibly future, but this conjecture will be developed below initially to account for eidetic or photographic memory.

In summary the first conclusions that can be drawn from Duplication Theory are as follows:

"Within a system of large numbers of similar particles in near perfect circumstances, then one specific pattern in space instigated into that otherwise random system, will tend to resonate or duplicate itself through time in a specific location (or within similar systems elsewhere: the same location relatively.)"

It will be noted that there are striking similarities between duplication theory and Rupert Sheldrake's morphic resonance. He states that there must be morphogenetic fields "that organise molecules, crystals, cells, tissues and indeed all biological systems..... All these kinds of fields are morphic fields. All morphic fields have an almost inherent memory given by morphic resonance..... I also suggest that our own memories depend on morphic resonance rather than on material memory traces stored in our brains." Both theories cover a number of implications for other phenomena beyond the working of memory. Before these are itemised for duplication theory, I mention that the arguments above can be applied to another more familiar effect: that of electromagnetism. If instead of the duplication of similar intervals in space (structures), the duplication of similar intervals in time (actions) is considered, a corollary becomes apparent. This will be analysed in more detail after the following explanations of the resonance through time effect. The theory stated thus far gives a basis of explanation for perfect recall under trance, and also for ordinary memory as an abbreviated form of total recall, with just those parts retained in synopsis in physical storage form within the brain that might be useful for increasing an individual's chance of survival. Further, the theory also offers a possible explanation in outline for the operation of intuition

APPLICATIONS OF THE THEORY

Memory

From F, a system in near singular random motion has the ability through self-ordering to duplicate any structure in the external world. Thus when the mind is stilled, with the brain cells firing randomly, there is an ability for any observable object from the external world to be duplicated by a similar mental structure. An assumption is made that such a perceivable image is projected holographically from the pattern created by the firings of interconnected neurons. Neuroscientist Karl Pribram (Pribram 1970) has carried out research to show that the brain's image making process is remarkably similar to the holograph which has the peculiar

property that the entire scene is recorded on every part of the film. Thus if a corner is cut off and removed, none of the picture is lost. Indeed, the corner alone, if properly illuminated, will reproduce the whole picture though with impaired definition. When the brain cells are busy producing ordered thoughts and also registering with great accuracy within the brain a visual image of the external world brought via the retina through to the brain, the firing of the interconnected neurons must be highly ordered in presumably the most complex patterns known to our experience. The huge amount of electrochemical currents passed between the synapses to bring about the firing of neurons will produce waves of electromagnetic induction, and these will inevitably interfere with each other. It is assumed that these interference patterns are capable of producing holographic images which will project out from the brain to become a representation in three dimensions of the reality of the external world in view: this is a similar postulate to that of Sheldrake in his Book 'The sense of being stared at.'

I refer to these mental holographic images as holocepts, and since they result from interference patterns of the radiated EM waves from the neurons, they are observed in three dimensions just as holograms are. The visual images in the mind formed by sight are so detailed and precise that such an assumption seems not unreasonable in that it is hard to remind ourselves that they are not more than images, rather than direct experience of an object at a distance. The holocepts that must be set up by the other senses are nebulous and much less strong and therefore harder to describe in words, but they will nevertheless be mental holocepts of structures thrown up in the mind by these interference patterns.

A further conjecture of the theory is that information from the retinas is channelled into the prefrontal cortex of the brain which processes the information initially, to then send it onto the occipital lobe at the rear: the visual processing centre of the brain. This trigger information from the prefrontal cortex will then instigate the occipital lobe to resonate with the image of the object under visual scrutiny, to produce a holocept of external reality in line of sight. On this line of reasoning one of the functions of the occipital lobe is to have its neurons easily capable of firing randomly. The brain in trance state, although void, is immensely susceptible to any outside influence. If a small element of structure is introduced, even as a very approximate copy of some external object, then the brain pattern will move to duplicate that external structure in as much accurate detail as possible (D). The more perfect the image in the mind, the greater degree of understanding of the external object, in that the holographic image in the mind for small or simple structures, becomes very similar in structure to the external object.

Having produced a form of possible explanation in principle for eidetic memory or total recall, the next step is to see if this might be adapted to the way in which ordinary memory operates. One problem is how the thought pattern from an earlier

time can be recreated in perfect detail to be inserted into a brain in trance state some time later to instigate the perfect recall sequence, even though from observation of experiments with subjects under hypnosis, this does appear to happen. One possible answer in general terms is as follows. DNA and RNA molecules are so complex and capable of carrying so much information that they have been considered good candidates for a basis of physical memory storage. Memory could be initially stored in short term form chemically in the brain, by series of single images received through the senses being encoded somehow within complex molecules (presumably DNA) as some form of short term memory. These trigger molecules are physically stored in the brain to initiate short bursts of memory flow whenever they are required later to help ensure more efficient survival.

If an event is repeated a large number of times, then the brain builds up a store of such trigger molecules which increases its chance of being retained long term. Alternatively, if an event occurs just once but it makes a deep impression (a near escape from death perhaps) then the resulting encoded trigger molecules become deeply embedded in the brain, never to be removed. Thus, the ordinary everyday working memory operates as a sort of telescoped perfect recall. Some external observation is made which is similar to a past experience, which stimulates the appropriate trigger molecule, which then runs a short length or perfect recall (a brief burst of holocept), which then in turn jumps a number of frames to the next significant part of the earlier sequence and so on, so that the former full length sequence is reduced and presented in almost an instant in a synopsis of memory frames. If the holoceptual flow created by a specific trigger memory molecule were allowed to endure for too long then the reaction time to deal with the new external circumstances would be too long for effective counter action. This would be no good for everyday survival of the fittest, but still can be invoked under special circumstances of trance or even quiet reflection, meditation, call it what you will.

To extend this argument, if enough trigger molecules get stored by repetition of an external event of consequence which turns out to enhance the survival chances of an individual, then the conjecture is made that a large accumulation of such molecules might become absorbed permanently into the system, especially if these memory molecules are either similar to, or based on DNA. In short, it would bear out to some extent Lamarck's supposition that acquired characteristics are inherited, which supposition has been reinforced in the last few decades by the recognition of epigenetic inheritance.

Intuition

The existence of memory is an undeniable fact whereas the concept and definition of intuition is far more nebulous. I have noted from many examples of the way in which knowledge is increased, that science often does not progress in an orderly fashion. Many important breakthroughs would appear to come in flashes of intuition, whereby the answer to a long standing and vexing problem is suddenly grasped and comprehended in an instant. Amongst number of examples quoted in Arthur Koestler's books on the subject are a number of examples, just one of which was the mathematician Karl Friedrich Gauss who described in a letter to a friend how he finally proved a theorem on which he had worked unsuccessfully for four years: (Montmasson 1931) "*At last two days ago I succeeded, not only by dint of painful effort but so to speak by the grace of god. As a sudden flash of light, the enigma was solved..... For my part I am able to name the nature of the thread which connected what I previously knew with what made my success possible*." On another occasion, Gauss is reported to have said: "*I have had my solutions for a long time, but I do not yet know how I am to arrive at them.*"

Thus far, it has been postulated that in near perfect trance or random firing state, a structure of firing neurons in the brain is more likely to reproduce an accurate or correct interpretation of the external world of nature, and its mechanisms, than an inaccurate one, simply through the operation of the minimum energy principle. If a scientist is attempting to divine a mechanism of how, say, molecules combine to form a certain complex molecule and there are literally millions of possible combinations and permutations, the task might seem beyond him or even the largest computer to check through all the possibilities. However if he has all the elements of the problem in his mind at a subconscious level, and he sleeps on the problem, or manages to bring about a self-induced trance state, where the elements of that problem are allowed to insert themselves into the otherwise random blankness of his mind, then on a quantum scale it will take slightly less energy for the neuron firings in his brain to form the holocept that then duplicates what actually occurs in nature, than any other possibility. The correct answer then presents itself through resonance with actuality, if perhaps he can bring himself out of trance state with some conscious vestige of its memory.

In more specific terms, the intuitive process can be described as follows. Having absorbed all the relevant facts in the memory, these are materialised as holocepts and combined, or parts superimposed over the top of each other in holoceptual palimpsests. The more variable facts there are, the more combinations and permutations there are, the more the mind has to shuffle through an impossibly large number in order to get a chance of hitting on anything like the right sort of combination. This would take an impossibly long time without some external guiding

force or tendency. But we have this guiding tendency in duplication theory: if circumstances can be made sufficiently random, with no external perturbations to disturb the randomicity of the neurons' firings, then the structures of the holocepts created from the interference patterns, will tend to form in the way that emulates most accurately structures in the external world. In other words, the mind in trance will tend to form holoceptual structures that duplicate those in nature, when given an initial vestigial prompting. It also seems not unreasonable to postulate that the brain has some form of mechanism for detection of this resonance, whereby it becomes aware that one particular combination of possibilities is correct. From B above "as two structures approach perfect duplication, they will tend to interact so that a small percentage of the rest mass of the later in time will demonstrate an increasing potential to convert to radiation." I am suggesting that the nervous system of the individual concerned detects this potential for energy release as a glow of wellbeing: the thrill of aesthetic pleasure, or just the pleasure of accomplishment when the correct answer has been achieved through resonance.

A further interesting point is the means whereby, once the correct understanding of nature has been grasped in holocept form, that information is relayed to others. In science, the problem usually has a relatively limited number variables to shuffle about, so that once the correct solution has been intuitively chanced upon through resonance, the scientist is usually capable of working backwards and thus building a logical sequence of small deductive steps, manipulating these steps so that the correct end result is obtained from the original separate bits of data. Each individual logical step is in fact an intuitive jump on a very small scale in itself, but so small is the jump concerned that it appears obvious, and has the appearance of logical deduction. Once this framework of logical steps has been constructed in retrospect, it then becomes possible to communicate the concept and explain it verbally, graphically, or mathematically to others in these small 'logical' steps, so that they might quickly comprehend it without having to juggle and consider all the relevant facts endlessly before the right relaxed conditions prevail and the flash of insight is at last attained.

A series of small intuitive steps guided in the right general direction is a much easier process to assimilate than the one large intuitive jump that the original thinker working it out for the first time ever, has to make. So it can be seen that the method of communicating knowledge to others through any form of communication, is a process of breaking down one large intuitive jump into a succession of little insights, all guided in the right direction. Gradually information is imparted step by step, in the right order until the collection of small insights builds up to the intuitive grasp of the whole concept that the originator perhaps had first to make in one step.

In the Arts, the intuitive process works in the same way, but on a much wider scale, not so capable of being broken down into small steps, so that it lacks the precise

definition of explanation available to the sciences. The concepts attempted by the artist, the impressions of nature as he comprehends it are on a much grander scale than those of the small precise steps taken by the scientist or mathematician, and inevitably, his task of communication is much harder, and it will never be broken down into the small logical steps required for efficient communication. A poet might intuitively recognise some fundamental truth of the universe, while considering memories of his observations of life in dreamy, absent minded state (Wordsworth's impressions recollected afterwards in tranquillity or Coleridge's composition of his striking poem, Kubla Khan). Such a fundamental truth will inevitably involve an imponderable multiplicity of facts, compared to the limited number of components that might be involved in a scientific problem, and the artistic task of communicating this intuitive understanding of particular circumstances to others is correspondingly much greater.

The intuitive jump the artist has made is so great and so general that he is probably, and no doubt temperamentally incapable of breaking his insight down into the little jumps required for others to easily grasp his truth. However, he might try to communicate the gist of it in the form of a few well-chosen words, or lines and colour in a painting, which might serve to spark off in others, by instigating the same sequence of thoughts or holocepts, which he realised. A single visual art work, for instance, might therefore be regarded as a sort of instant trigger to instigate in others, hopefully, the same holoceptual sequence that the artist experienced, a form of communication based on a minimum of initiating information. The observer would then have inculcated within in him a similar comprehension (similar neural patterns) as inspired the original artist. Exactly the same arguments can be applied to reconcile the Eastern way of acquiring wisdom through trance and stilling of the mind, with the Western approach of small jumps of apparent deductive logic. In essence, they are the same but on a different scale, despite the fact that they may at first appear as completely at odds with each other as is possible.

The Eastern mystic concentrates on emptying his mind via any one of the many techniques for doing so such as contemplation, fasting in isolation, yoga, or even the dervishes spinning like a top on one spot: there are many such techniques but all concerned with emptying and stilling the mind. To most Western scientists this might seem the antithesis of the way in which he acquires wisdom and knowledge of the way in which nature operates, but if emptying the mind of structured thought patterns equates to a random pattern of firing synapses, then if that randomness starts to approach a near perfect of singular state, what might occur? By the arguments set out above, certain problematical circumstances in the external world that were under consideration before the trance state was assumed may, given a tiny initial instigation, be replicated and resolved almost at a stroke. This assumes enough necessary data in detail has been previously assimilated and perhaps stored in short

term of chemical storage molecules, albeit in a chaotic or unordered manner which previously did not present any coherent resolution. This replication in holocept form of the structures under consideration in the external world is at suddenly recognised in that it presents itself as the only possible answer. This is recognised by the generation of an increase in the potential to convert the rest mass of the duplicate holoceptual image by resonance into a vestigial amount of energy: the Eureka moment if realised on a matter of substance.

Self-awareness and Consciousness Duplication theory explains how the mind produces these holocepts but there is the further major problem of how these holographic images are viewed or registered. This is a problem in philosophy, which they call, amongst other descriptions, the problem of the homunculus: the identity of the little man inside the brain which involves yet another little man within the latter's head and so on in an infinite recess. The explanation above of intuition does away with the need for the homunculus as an internal viewer. When an increasingly accurate state of the structure and events in the external world becomes duplicated as a holocept in the eyes and/or understanding of the beholder, there is an increasing potential for the material particles of the involved resonating structure to convert to radiation energy. If so then this leads to a postulate that a dominant purpose of the intelligent, or indeed any animal organism, is to recognise and detect this resonance, which represents a lower energy level or more stability and therefore more desirable to nature. This represents a tendency towards a more ordered state of affairs, a negative entropic tendency, when it is remembered that the concept of order depends on pattern and duplication. The physical body and brain of an intelligent organism exists to detect pattern, duplication and order, and indeed to exert itself on the external world to bring about increase in the degree of order. This activity is in itself, the operation of self-consciousness. There is no need for the homunculus as a viewing mechanism. Increasing self-consciousness is nothing more than an increasing ability to duplicate in holocept form the structure of the external universe. The latter process is also another way of increasing understanding generally.

When an answer to a problem is sought, and then found, its resolution produces not only intellectual pleasure, but also a physical sense of wellbeing, depending on the extent and complexity of the problem. All human beings strive to increase their pleasure or enjoyment in life, so that it could be argued that if the resolution of the truth represents the highest form of pleasure, then the purpose of human intelligence is to detect more and more truth in the universe. In this respect 'Truth' means in general terms, the accurate portrayal in holocept form in the mind of the structure of the external universe. In the same way the concept of understanding is no more than a duplicate image formed in the mind in holocept form of the mechanisms of a certain part of the external world that is under consideration, which is accompanied by a

sense of pleasure or achievement (potential to release energy) thereby created in that particular organic and intelligent system.

Other applications

Rupert Sheldrake, particularly in his first and second published books dwells in depth on a number of other applications of his hypothesis of morphic resonance of similar structures through time. This includes inheritance of acquired characteristics, group behaviour and ritual so I will not dwell on these, having indicated the way in which duplication theory can be seen to be applicable to mind and memory. However, I would emphasise that once the operation behind memory is understood in principle, with time and further research, it should become possible to duplicate the mechanisms involved to create a system of artificial intelligence. I would also mention the work of Anton Zeilinger, professor of physics at Vienna University, working on and producing practical applications for quantum entanglement. Zeilinger's group is developing a quantum cryptography prototype in collaboration with industry, and has demonstrated quantum communication over large distances is not only possible but has been achieved. His explanations of the practical applications of quantum entanglement emphasise strongly the role of randomicity in the process. It is a fact that information can now be transferred over large distance simultaneously, (faster than light speed) but that this cannot take place without the system operating in an entirely random manner. Further progress on this subject would appear to be very relevant to duplication theory, although it is early days yet.

RESONANCE OF SIMILAR EVENTS THROUGH SPACE: THE COROLLARY

Mention was made earlier to a corollary definition of this resonance effect as a form of explanation for electromagnetic radiation. Briefly duplication theory gives an alternative explanation to Maxwell's field theory of electromagnetism as follows:

"*Within a system of large numbers of similar particles, a specific pattern in time -a repetition of similar events- will tend to resonate or duplicate itself at all other points in space at that one moment in time, wherever other similar particles exist in free or random motion.*"

During the development of the theory, the principle of resonance through time was first conjectured to form a basis for perfect recall, but its original short definition left something to be desired. It was later realised that if the words space and time in the original definition were reversed, then an apparently reasonable description of EM

radiation resulted, and an intriguing symmetry was brought about. The characteristics of electromagnetism are well known so it was easier to define for it a new alternative definition in terms of resonance, and this then made apparent a more precise definition for the entirely new resonance through time effect to give the following concise summary of the whole theory:

"*Equal intervals in one location -similar structures- tend to duplicate themselves through all time in that one location. Equal intervals in time -similar actions- tend to duplicate themselves through all locations at that one time.*"

It will be noted that so symmetrical is this definition, that the words time and location are interchangeable without losing the sense of both parts. The second part of the definition above can imply that electromagnetic action radiated out from a source of oscillating charged particles (electrons) does not require photons or particles of any sort to be transmitted across space, so that there is no physical exchange particle or even a physical wave as such. Rather it is the repetition of the identical actions of billions of similar particles at source which causes a potential for these oscillations to be duplicated whenever any similar free particle is encountered at a later time across space. But since this front of potential action moves out at light velocity in a wave front it is effectively the same as saying this duplication of action is created everywhere else at the same moment relatively speaking, so this fits with the definition: "at one time". Further the greater the degree of duplication, then the stronger the radiative effect of the action will be: in other words, as the frequency of the AC source increases so will more action be transferred across space and this is borne out by experiment and observation of EM waves in practice.

Equal intervals in time can only be created by the repetition of similar events and the about the simplest regular event imaginable event that I can visualise is that of a single electron passing a point in space and then decelerating back until it passes it again the opposite direction and so on and so forth. If the degree of acceleration and deceleration and the distances travelled are the same in every case then the degree of duplication of action will be increased. If huge large numbers of electrons, identical to the point of indecipherability in dimension and charge are involved, all duplicating the actions of each other as they will be in a source of alternating current, then here is perfect embodiment of what is required by the subject at issue. What cannot be denied is that it produces a similar effect on all other free electrons at the same time everywhere in space. Two hundred years ago we might have thought this was an astonishing and singular hypothesis but now it is taken as a basic given of existence. The reason why it should happen is all I am querying here, which as far as I am aware, has not been given at a fundamental level other than force is certainly observed to be transmitted through space at one moment in time.

The second part of the definition above was produced by reversing the words time and location as noted. The result is surprisingly symmetrical and can be rationalised to explain the transmission of EM action as follows. In a very regular alternating current, close approaches are being made to near singularity state in similarity of events (effectively intervals of time), then using the rationale as before, it might be expected that some curious effect beyond that expected by the rules of nature as they were known before Faraday, might be expected to be manifested. That is exactly what was observed in the generation of force at a distance with which we are now familiar as electromagnetic radiation: two hundred years ago, it was very singular until it was later quantified and explained by Maxwell from 1860 onwards.

Perhaps the clearest example of how this new definition of the way in which EM radiation is created and transmitted is as follows. In a molecule of neon, electrons can be considered in orbit around the nucleus, configured in shells depending on their different energy levels. For instance the first shell can accommodate 2 electrons, the second shell 8 electrons (2+6), the next 18 (2+6+12) and so one. Neon has atomic number 10 and has 2 electrons in the first shell and 8 in the next. According to the laws of quantum mechanics for systems with only one electron, an energy level is associated with each electron configuration and, upon certain conditions, electrons are able to move from one configuration to another by the emission or absorption of a quantum of energy, in the form of a photon. If one electron jumps from one energy level in neon to a lower one, then energy is emitted in the form or red light of a specific frequency. Each quantum jump is singular and absolutely identical to all the similar trillions of quantum jumps taking place at that level when the neon is excited externally. The relevant electron disappears from one shell and simultaneously appears in the lower shell. This is a fine example of a very singular event and duplication theory conjectures when this occurs there should be a resulting unusual and hitherto unexpected side effect which in this case is experienced in the emission of red light of a very specific frequency. This seems as good a demonstration of the second part of duplication theory as any, although there are others which will not be dwelt upon in this paper which is more concerned with structure duplication through time rather than EM radiation.

However it should be noted that this new alternative way of regarding EM transmission does away with the notion of the photon and is effectively a principle of force at a distance. There have always been problems with, one of which is that EM radiation is not symmetrical (it is one way only outwards and does not return), and this has been rationalised by a mathematical process called renormalisation. As far I can understand it, is something of a fudge. Richard Feynman, the leading expert of quantum electrodynamics said of it in 1985:

"*The shell game that we play ... is technically called 'renormalization'. But no matter how clever the word, it is still what I would call a dippy process! Having to resort to such hocus-pocus has prevented us from proving that the theory of quantum electrodynamics is mathematically self-consistent. It's surprising that the theory still hasn't been proved self-consistent one way or the other by now; I suspect that renormalization is not mathematically legitimate.*"

I mention Feynman in particular since included in my web site is a recent section which compares the similarities of the way in which I rationalise this second part of duplication theory and EM radiation with Feynman's Absorber Theory, which he published in 1945 with another perceptive and eminent physicist, Archibald Wheeler. Their paper attempts to reconcile force at a distance with EM radiation instead of photons in a manner which is remarkably similar to a paper I completed relatively recently. I mention this only in passing, since Feynman's reputation as a physicist is second perhaps only to Einstein, and his Absorber theory has always been a subject of interest and contention. Interested parties will have to take it up from my web site.

It was when this second part of duplication theory became apparent to me, some months after I came up with my conjecture of structure resonance through time, that I first realised there might be something worthwhile in the conjecture of the latter since the wording of the definitions were so surprisingly reversible, enough to suggest there might be some corollary effect involved and which then transpired to be pleasingly simple. That together with the fact that the existence of EM radiation could not be disputed, helped reinforce my conviction, and also the fact that there certainly remains some doubt about the way in EM radiation and electrodynamics are currently understood. As a result I studied the subject further and have been able to recently draft a further paper which appears to be little connected with concerns of mind and brain, but more with cosmology given the implications of regarding EM transmission in this other way. However, this is way beyond the remit of this paper so interested parties would have to resort to my web site (www.mindandmemory.net).

FURTHER POSSIBLE APPLICATIONS OF STRUCTURE AND EVENT RESONANCE

Probability and Symmetry

The law of probability is so universal and so much taken for granted as the basis on which statistics and the whole of quantum physics operates that I am not aware if the reason for its existence has ever been deeply investigated or explained. As far as I am aware it has not, presumably because it is regarded as a fundamental given from observation. However, if duplication theory is taken to be correct, then a chicken and

egg question can be seen as to which principle, duplication or probability, are more fundamental, and whether one results from the other or vice versa.

If a coin is tossed one hundred times, then it will fall half heads and half tails, within a margin of about plus or minus fifteen percent. If the coin is tossed one million times, then it will fall heads fifty percent of the throws within a tiny fraction of a percent. This is perhaps the most familiar demonstration of probability, and despite the fact that quantum physics and therefore the whole behaviour of nature is based on this law, there seems to be no explanation given for this symmetrical mode of behaviour, other than blind acceptance just because it is so. Probability could be described as another embodiment of the generalisation which seems prevalent in physics that everything in nature must be symmetrical.

It would seem that this observation that patterns of events becoming more perfectly symmetrical as the numbers of events increase sounds familiar with some of reasoning involved in the development of duplication theory. In section D above on 'the same location' it was shown how the effect of large numbers of surrounding particles obscured the effect of different locations and hence fluctuations in gravitation or other perturbing external forces, and it was later explained how if the rate of duplication of action, or frequency, is increased, the resonance effect anticipated by duplication theory should be stronger. In short the larger the number of similar events involved, and the more random the system, the more prevalent is the imposition of pattern and order on that system. This is remarkably similar to the operation of probability, and it could be argued that probability is a result of duplication theory. However, it could also be argued that the latter does provide some form of insight into the reason for the existence of probability where formerly there was nothing other than to say it exists a priori. Perhaps it is easiest to regard both phenomena as being interdependent on each other: different manifestations of the same thing.

Complementarity of the electron

When the electron is at a certain energy level round a nucleus, as mentioned briefly above, it is somewhat misleading to regard it as a particle circling in orbit. Schrödinger solved his equations to show that it could be more accurately considered as a probability distribution or smear of matter spread out through all space, but concentrated in certain areas. However, as the orbit moves further out, so the electron begins to behave more like a normal particle and less like a matter wave. At its most stable and lowest energy level state or orbit, the electron could be regarded as revolving at an enormous rate, which it would with the minimum circumference, but what would duplication theory predict for such behaviour? There is both time and

space duplication here. There is action repeated in the regular very rapid frequency of rotation so that there should be a simultaneous transmission effect to all space, and this occurs according to Schrödinger's equations. Also, the electron occupies the same location at the end of each revolution, at precisely the same distance from the nucleus, so that there is an element of duplication of equal intervals in space to quantum levels of accuracy. This would produce a strong tendency for resonance of the repeated structure through time. The higher the frequency of this structure repetition of the inner levels, the more would the mass of the electron tend to resonate through time, and possible increase this effect of matter being smeared out through time as well as space. In a way, this is what is observed to occur in standard theory when the particle quality of the electron disappears closer in according to probability distribution. In duplication theory the further out the orbit, the less duplication as the frequency of revolution diminishes, and the more qualities of material substance are demonstrated by the electron, it being less resonated through time.

Gyroscopes

A similar argument can be used to explain the stability of the gyroscope. If a particle of metal within the disk of a gyroscope is considered, then that particle repeatedly occupies the same location at very regular intervals, and it will therefore set up a resonance in time with itself in that location. The higher the frequency of spin, the stronger the resonance effect, and the more likely will that particle demonstrate a potential to resonate with itself through time, or in other words, repeatedly occupy the same location through time with respect to its surrounding circumstances. It will become more stable and resist being moved out that plane.

Inertia

A structure comprised of large numbers of particles bearing an ordered relationship to each other will ex hypothesi tend to resonate through all time in the same location (Equal intervals in space -similar structures- tend to duplicate themselves though all time in one location). Thus the more complex the structure, in that it has greater numbers of component particles, the stronger will be the tendency for it to resonate with itself through time in the same place. The fewer the numbers of particles comprised in a structure the less will be this tendency to remain in that same location. In other words, the more complex and ordered the structure, the more it will resist any attempt to move it elsewhere. In short there will be an inertial effect against any force attempting to accelerate it away from its present position or line of steady motion. Again, as far as I am aware, there is no understanding of why mass should resist acceleration or being moved: it is just observed to be so, and this quality is

described as inertia. It is just an observed given, although duplication theory would seem to be able to explain why it is so in terms of a more fundamental principle. In one of the sections in my web site on cosmology, I develop this definition of inertia to show how it might be directly connected with gravitation and how the latter might be emergent, rather than a fundamental force, but again this is beyond the remit of this paper, and is doubtless far too hubristic.

SUMMARY

Duplication theory proposes that there is a principle of self-organisation which acts to increase form and order by duplicating similar structures. My view is that the reason for its existence and its prime function are to counter the opposite tendency of entropy under which disorder is increased. It is a vitalist hypothesis, and one of its most obvious applications which I have not covered at all, would be to render a relatively easy means of explanting how life started on Earth, or anywhere else for that matter, but I know little of biochemistry.

One of the founder figures of Quantum theory was Erwin Schrödinger, a man of inexhaustible curiosity, and he published a small booklet in 1945 "What is Life?" from which I quote as follows.

"*It appears that there are two different 'mechanisms' by which orderly events can be produced: the 'statistical mechanism', which produces 'Order from disorder', and the new-one, producing 'order from order'. To the unprejudiced mind, the second principle appears to be much simpler, much more plausible. No doubt it is. That is why the physicists were so proud to have fallen in with the other one, the 'Order from disorder' principle, which is actually followed in nature and which alone conveys an understanding of the great line of natural events, in the first place of their irreversibility. But we cannot expect that the 'Laws of Physics' derived from it suffice straightaway to explain the behaviour of living matter, whose most striking features are visibly based to a large extent on the 'Order from disorder' principle.....*

We must therefore not be discouraged by the difficulty of interpreting life by the ordinary laws of physics. For that is just what is to be expected from the knowledge we have gained of the structure of living matter. We must be prepared to find a new type of physical law prevailing in it. Or, are we to term it a non-physical, not to say a super physical law? No, I do not think that. For the new principle that is involved is a genuinely physical one: it is in my opinion, nothing more else than the principle of quantum theory over again. To explain this, we have to go to some length including a refinement, not to say an amendment, of an assertion previously made, namely, that all physical laws are based on statistics."

Duplication theory is nothing if not an order from order principle and having read the above words in the book of such a great luminary of physics after I had produce the first early draft of the theory, I was much encouraged.

SUPPORT FROM THE WORK OF OTHERS

A mathematical proof for the quantum interconnection of similar structures with special reference to psi exists in a paper by Arthur Chester (1981). The published paper of 22 pages is a condensation of a much longer paper of 700 pages which took its author 7 years to complete working on his own, separate from his career as a physicist working on lasers in industry. He was President of research for Hughes Research Laboratories in California, and specialised in lasers and fibre optics. The mathematical proof is very complex but the written explanations and conclusions are markedly similar to duplication theory, as indeed are the philosophical implications as set out in the long version which is not published. His work indicates mathematically that positive psi effects will diminish with tightened control; "*otherwise, the results would become sufficiently convincing to change the belief patterns of critics of psi.*"

He develops what he calls 'the inertia of beliefs', in his original paper, 'Similarity, A physical theory of psychic phenomena' (1979) in the following manner.

"*That is, if the outcome of an experiment will affect the spatial patterns of matter anywhere, through its effect on people's thought patterns, on their actions, or upon the physical movements of other matter, then a bias will be introduced into the probabilities of the experiment's possible outcomes. Experiments and other events will tend to turn out in such a way that they do not 'change the world' (i.e. alter its patterns). More specifically for this example, events will conspire so that people's belief patterns will not tend to change very rapidly. This may be described as an 'inertia' or constancy in beliefs. The events whose outcomes are thus affected may be almost of any kind of process..... psi experiments, magic rituals, or physical measurements of quantities.*

Perhaps the strongest support, or at least the most widely read of recently published works, to support duplication theory is Rupert Sheldrake's 'New Science of Life' (1981), mentioned earlier in the text above. I have been corresponding and meeting with Rupert regularly since 1983 when I first read his book. I give one quotation from his first book below to illustrate our similar conclusions albeit derived from very different approaches.

If morphogenetic fields are responsible for the organisation and form of material systems, they must themselves have characteristic structures. So where do these field-

structures come from? The answer suggested is that they are derived from the morphogenetic fields associated with previous systems: the morphogenetic fields of all past systems become present to any subsequent similar systems by a cumulative influence which acts across both space and time. According to this hypothesis, systems are organised in the way they are because similar systems were organised that way in the past. For example, the molecules of a complex organic chemical crystallise in a characteristic pattern because the same substance crystallised that way before; a plant takes up the form characteristic of its species because past member of the species took up that form; and an animal acts instinctively in a particular manner because similar animals behaved like that previously. This hypothesis is concerned with the repetition of forms and patterns of organisation; the question of the origin of these forms and patterns lies outside its scope. This question can be answered in several different ways, but all of them seem to be equally compatible with the suggested means of repetition."

Both papers were produced separately without any reference to each other, although coincidentally the time of writing was about the same, which as Sheldrake has pointed out, might be expected ex hypothesi. Similarly Arthur Chester finished his long paper in October 1978 and the first properly typed draft of Duplication theory was finished in January 1979.

Sheldrake's second book, The Presence of the Past' (1988) made a further lasting impression on me, in particular his comments on the possibility that the great constants of physics might not be fixed and might be evolving with time. If this were so then the whole study of physics would be well overdue for a radical reappraisal. There is some astronomical research being carried out currently, part of whose function is to test for this possibility, the possible implications of which I have discussed in some detail on my website.

Physicist, J.S. Bell, published a theorem in 1966, showed in mathematical terms, that there can be a connection between distant events in the absence of any intermediary force or signal, and that this action at a distance will be simultaneous. This bears out the view of quantum theory that apparently indicates that there are no such things as separate parts in reality, but instead only intimately related phenomena inseparably bound up with each other. The problem with quantum theory is understanding how force at a distance can operate, and this problem was first faced inconclusively in the paradox of Einstein, Rosen and Podolsky, published in 1935. Bell's theorem was tested in the laboratory in 1974 by two Berkeley physicists, Freedman and Clauser, who managed to complete a successful correlation experiment on polarised photons, which vindicated Bell's theorem as far as quantum interconnectivity is concerned. Alain Aspect in Paris carried out successful experiments in 1982 and a host of others have followed, culminating in the work done by Anton Zeilinger mentioned above.

A Psychiatrist, Ninian Marshall, in 1960, proposed a theory of 'Resonance Phenomena' as a physical explanation for precognition. This is summarised in Danah Zohar (1982) in her book 'Through the time barrier' as follows:

"*The gist of Marshall's theory was to make the leap from the proven ability of single neurons to respond to single quantum processes to hypothesising that there are:*

1. *A means whereby single quantum events (virtual transitions) can band together to build up a pattern and further:*
2. *A means whereby the brain could magnify these microscopic quantum patterns into microscopic perceptions. He called these pattern forming and magnifying processes 'resonance phenomena', and he likened them to the kind of resonance effects which exist between oscillating objects such as tuning forks, or window panes vibrating in harmony with rattling railway lines. Phrasing his theory in terms of a Law of Resonance, he stated, 'Any two structures exert an influence on each other which tends to make them become more alike. The strength of this influence increases with the product of their complexity, and decreases with the difference between their patterns.'*

Thus if there is any similarity between pattern formations in the brain and patterns building up in the virtual transitions of quantum phenomena, the increasing tendency towards a pattern amongst the virtual transitions (the theory holds) is going to create an increasing similarity in the patterns being built up in the brain's reverberating circuits. This concept is similar in many ways to Jung's synchronistic notion that 'like attracts like.' An event (subatomic in this case) is thought to act like a magnet drawing others into its own 'vibes' and thus building up a pattern which mirrors itself..... Thus Marshall proposes a physical theory of recognition based on the brain's supposed ability to tune into the probability states of quantum virtual transitions and to experience, through resonance, a pattern formation which could mirror at a level accessible to consciousness any pattern formations amongst probabilistic events - if these exist."

Marshall's theory is strikingly similar if not almost identical, to the half of duplication theory that deals with the resonance of similar structures.

Eminent physicist David Bohm, in his book, 'Wholeness and the implicate Order' (1980), developed his ideas and his central theme of the unbroken wholeness of the totality of existence as an undivided flowing movement without borders. He examines a number of the same subjects as are analysed by duplication theory, and in particular, the concept of order, and he arrives at some conclusions which are remarkably similar to those of duplication theory, especially with regard to

consciousness, life and cosmology. Mechanistic order, the ordinary concept of order which we are familiar, he contrasts with his new concept implicate order where "*everything is enfolded into everything.*" He suggests that this implicate order is not manifest, nor "*something solid, tangible stable to the senses (or to our instruments).*" This putative law of implicate order would present a much more coherent account of the quantum properties of matter than does the traditional mechanistic order, and therefore the former concept is more fundamental than the latter. To give some further idea of the similarities between Bohm's work and duplication theory, a few further quotations from the latter are given as follows.

"*It is suggested here that this is the seed or nucleus of a very general way of perceiving order, i.e., to give attention to similar differences and different similarities... By thus introducing what is in effect the beginning of a hierarchy of similarities and differences, we can go on to curves of arbitrarily high degrees of order. As the degrees become infinitely high, we are able to describe what have commonly been called 'random' curves - such as those encountered in Brownian motion. This kind of curve is not determined by any finite number of steps. Nevertheless, it would not be appropriate to call it 'disordered', i.e., having no order whatsoever. Rather it has a certain kind of order, which is of an infinitely high degree...*
It is clear that thought, considered in this way as the response of memory, is basically mechanical in its order of operation. Either it is a repetition of some previously existent structure drawn from memory of else it is some combination of organisation of these memories into further structures of ideas and concepts, categories etc. These combinations may possess a certain kind of novelty resulting from the fortuitous interplay of elements of memory, but it is clear that such novelty is still essentially mechanical (like the new combinations appearing in a kaleidoscope)."

Jon Taylor published a paper on precognition in 1995 in the journal of the SPR which was based on resonance of similar structures of firing synapses in the brain and which I saw at once was equivalent to Duplication theory. He had a very comprehensive and excellent paper in the PA journal published last year in 2014. He considers precognition to be the fundamental phenomenon of ESP and manifests as information transfer from the brain in the future to the same brain in the present. He notes that Bohm's theory of implicate order is compatible with his model and it suggests that if similar structures are created at different locations in space and time, the structures resonate with a tendency to become more similar to one another. He considers that there is possibility of contacts with other brains, and these contacts would occur either in real time or at different times. This is all very similar to Duplication theory and his explanation of how the intervention paradox is avoided via intuitive warnings is masterly. Although I do not contain any descriptions of ESP effects in this paper,

my interpretation of precognition in earlier papers is very similar to Jon Taylor's rationale and we have communicated sporadically over the years.

Experiments were carried out in 2004 and later again in 2007 by Rita Pizzi of Milan University, in department of information technologies. This was reported a number of times but most recently at the SSE meeting at Viterbo in 2009: '*Evidence of neuron sensitivity to ultra-weak electromagnetic fields.*' Her team cultured brain tissue (human neural stem cells) on to micro electrode arrays connected to amplifiers, oscilloscopes and recording equipment. When low power laser light was fired on to a sample in a bowl at regular intervals, another similar bowl of neurons, responded in a similar fashion to the burst of laser stimulation, even though the latter was shielded within a thick aluminium cylinder, the whole system encased in a brass Faraday cage. The latter was to minimise any external EM radiation from the external supply. When ordinary LED light was used, there was no such resonance effect. Their observations stated:

"*We concluded that the phenomenon should not be due to the laser itself but to an electromagnetic field coming from the laser supply circuit. Neurons appear to receive and amplify a signal whose value through the air, measured with a filar antenna (suitable to detect electromagnetic frequencies), and before reaching the Faraday cage, is under 2mV (sensitivity threshold of our oscilloscope). The value of the electric field under the double Faraday cage is under the sensitivity of our instrumentation but is estimated to be at least one order of magnitude less. It must be stressed that in order to cause an action potential (spike), a neuron needs to be stimulated inside the cell with a 30 mV pulse. In order to evaluate the intensity of the magnetic field we used a high-sensitive Gaussmeter, whose sensitivity threshold is around 70 μG. The laser supply circuit, when turned on, generates in the near of the Gaussmeter around 0.002 G, but when moving away the Gaussmeter beyond 30 cm, the field intensity gets under the Gaussmeter sensitivity. During the experiments the laser circuit was at least 50 cm far. We could not assess the intensity of the magnetic field (if any) received by the neurons during the experiments because it is so weak that it gets under both the oscilloscope and the Gaussmeter sensitivity.*"

No explanation has been satisfactorily found yet for this effect, and the controversial results appear to have been somewhat ignored thus far, although Pizzi is waiting for a similar experiment to be carried out by another university to further investigate and to produce an explanation for this apparently anomalous result. Since laser light is far more ordered than LED light and the neurons are highly complex, this result is reconcilable with duplication theory, but which it is not by current belief patterns.

Conclusion

Duplication theory is radical in approach but the author finds some comfort from the number of other theories described above which are based on similar considerations. He also derives satisfaction from the manner in which the theory can be applied to explain a number of disparate phenomena, some of which are familiar and apparently easily explained and some others which are not. A more detailed version of the above may be found on the author's web site (www.mindandemory.net). This includes further implications of the theory describing its similarities to the Absorber Theory of Feynmann and Wheeler (1945) which deals with the possibilities of force at a distance without the involvement of the concept of the photon an exchange particle. It also takes further the development of the possible applications of the theory to the clarification of inertia.

REFERENCES

- Baddely A. D., *The Psychology of Memory*. Harper & Row New York, 1976
- Bell J. S., Review Modern Physics, vol. 38, p.47, 1966
- Bohm D., *Wholeness & the Implicate Order*. Routledge Kegan Paul, 1980
- Chester A. N. *A Physical Theory of Psi based on Similarity Psychoenergetics*. Vol. 4. nu. 2, P. 89-111 1981
- Einstein, Rosen, Podolsky, Physics Review, Vol. 47, 1966
- Greaves N., *Duplication Theory*: Journal of Scientific & Medical Network, December 1988
- Greaves N., *The Problem of Repeatability or do the Laws of Nature evolve*? Review of the Society for Psychical Research 1999
- Hadamard J., *The Psychology of Invention in the Mathematical Field*, Princeton University Press, 1949
- Koestler A., *The Act of Creation*. Hutchison 1964
- Koestler A., *The Ghost in the Machine*. Hutchison 1967 Duncan, New Haven, 1890
- Marshall N., *ESP and Memory: a Physical Theory*, British Journal for the Philosophy of Science vol X. 1960
- Montmasson J.M., *Invention of the Unconsciousness*. Routledge Kegan Paul London p.77, 1931
- Nicolis G., *Prigogine Self Organisation in Nonequilibrium Systems*, Wiley-Interscience, New York, 1977
- Pizzi, R. et al., *Behaviour of living human neural networks on microelectrode*. Proc. Nanotechnology Conference and Trade Show 2004, Boston 7-11 March 2004.

- Pizzi R. et al., *Evidence of Neuron Sensitivity to ultraweak electromagnetic Fields*, SSE Convention Viterbo 2009
- Podolsky B., Physics Review, Vol 47. 1966
- Pfleegor R.L., *Interference of Independant Photo Beams*, Physical Review Vol 159, Manel L., 25 July, 1967
- Pribram K.M., *Languages of the Brain*. G. Globus et al: eds. p56. Plenum, New York, 1971
- Schrodinger E., *My view of the World*.
- Schrodinger E., *What is Life*? Cam. Univ. Press. 1944
- Sheldrake R., *A New Science of Life*. Blond and Briggs,1981
- Sheldrake R., *The presence of the Past* 1988
- Smythies J.R., *Science and ESP*. P.3. Routledge Kegan Paul, 1967
- Taylor J., *The Nature of Precognition*, Journal of PA 2014
- Zohar D., *Through the Time Barrier*. Heinemann, 1982
- Zeilinger A., *Dance of the photons: from Einstein to teleportation*, 2010