NES HEALTH
Through Energy & Information

The Coming Medical Revolution

This lengthy lecture was originally prepared in 2006 by Peter Fraser for health practitioners and other professional users of NES Health products. It provides, at a basic level, a theoretical bridge between orthodox medicine and the new bioenergetic and bio-informational approach to biology and health.

Symptoms of ME/CFS

Upon first looking into science, you get the impression that it is cut and dried and well arranged, and somehow timeless and satisfying because of that. In fact, scientists like to imagine that this is so because they are great truth-seekers and none of them want anything to change too much or too quickly and upset their power base in the knowledge game.

As life goes on, you realise, as I have, that science as it stands does not give us quite the solidity we want it to and still suffers from some severe practical problems. Among the most severe problems for me is the fact that the theory of orthodox medicine and the theory of physics don't match up, and that the problem is not a little problem of some ragged edges or grey areas, but wide-ranging in its scope. There is a historical reason for this: allopathic medical theory developed from the ideas of industrial chemistry and was backed by an industry wanting to use chemicals for agriculture and medicine, while modern quantum physics, the science underlying bioenergetic medicine, did not develop fully until much later, the mid-1920s, and does not link to biology.

In this lecture I shall show how the cleavage continues, having been maintained willingly by both groups of scholars, with the result that there is a massive disconnect in medicine, as well as severe disarray in the physics of space.

We can further delineate this problem by noting that the cleavage was so deep in the early part of the twentieth century, that those who believed that biochemistry lay at the heart of medicine waged war on those who didn't - the practitioners of energy medicine. This battle resulted in the expulsion of the practitioners of herbal medicine, one of the schools of energetic medicine still extant in Europe and North America at the start of the twentieth century.

Other energetic practitioners were also driven out or threatened, such as those following the older school of homoeopathy, which began in the eighteenth century. The results of the Flexner Report, published in 1910, and other inquiries were such that the biologists and others who believed in a field theory were prohibited from practising in the United States, although they held out until the 1940s in some European countries. Can you imagine the expulsion of whole groups of thought or entire departments from a university in these days of broader educational understanding? No, of course it would be a scandal. But that is what happened in the 1920s in Anglophile universities all over the world—the United Kingdom, the United States, Australia, New Zealand, South Africa and Canada. Barbara Griggs's Green Pharmacy records some of the history of these expulsions and is destined to be a standard work on the history of the evolution of herbal medicine.

Suppression of ideas does not always have the effect one would like it to have, and this has certainly been the case here. John Stewart Mill, in the nineteenth century, said that you never

know whether or not you are suppressing truth when you suppress an idea or a thought. Nobody has the entire truth, so it is best to be as tolerant as possible, even of your intellectual enemies.

One of the effects of the drive to eradicate energetic medicine from tertiary education, was to stop its development and cause a withering away of its basis - research funds. So bioenergetic medicine in the Anglophone world was stopped in its tracks in the 1920s and failed to develop the huge infrastructure of belief that has attended the biochemical medical model. Yes, the present medical model is basically a belief structure, like anything else. And when the weaknesses of a belief

structure are pointed out and it is damaged beyond repair, there is inevitably a great hue and cry. One would expect this phase to last a very long time, so heavily propagandised is the current medical model, yet ideas can change very suddenly when there is reason to do so. However, science does not change unless it can offer better explanations for reported events.

Given that the two systems, biochemical medicine and physics, do not connect well with each other, we have initially to ask which discipline is at fault. Here it is a little like marriage counselling, and we have to say that there is fault on both sides. A great deal has been written about the failings of modern medicine, but little indeed on the fault lines in modern quantum physics. Most writers seek to paper over difficulties and contradictions, and perhaps I am no exception. So in trying to get medicine and physics back together again, it is perhaps a good idea to do away with the fault-finding and replace it with a genuine effort to lace these two ideational systems together for the benefit of all of us.

Against us in this effort are those who have invested in the current systems, but I truly believe that the way ahead for everyone is to abandon ideas that don't work and won't fit into a greater whole. I cannot tell you how many times I have completely rearranged in my head a whole set of data emanating from medical knowledge due to the experimental data coming from my enquiries into quantum physics. It is at once exhausting and exhilarating. So I expect that many of you may be deeply aggravated by this lecture. I ask you to bear with the ideas and accept that your anxiety may be due to the natural resistance we all have to massive rearrangements of ideas concerning who we are and how we work.

Physics: The View from the Top of the Mountain

When you undertake to learn physics in the tertiary system, you start at the bottom and are encouraged to look upwards, and perhaps you can't see very far. You believe what you are told, because you are given a great deal of data that supports the ideas. In the case of physics, the evidence is experimental data, summarised by mathematical models. The mathematics does not prove the ideas, but it does delineate them clearly. In other words, in physics we have to go beyond linguistic clarity to mathematics, which is symbolic clarity. When we do, we have good science, because we have set up models of systems that can relate to each other. Science, according to Dr Edgar Mitchell, has to be in accord with nature as well as with mathematics. But nature takes precedence!

Proof, if there is such a thing, is a two-edged sword. By using analysis, we see whether or not an idea is able to survive a process of pulling it apart into its components. That is one edge of the sword and we are able to use it without any bother. But the other edge requires that the information melds with other information. This is called coherence, and it is a higher-level process than analysis. Only a few people have the gift of seeing the big picture and then assembling data within that picture.

Of course, the analysis part comes first and the coherence part comes second, since you can't put things together into a pattern until you have the pieces. This is an important statement, because for more than 150 years a huge bank of experimental data has been accumulated by physics, and the job of making this data coherent is a great one. A great scientist who can rise to the task appears rarely. Of course, Einstein was one - revered not so much for his hairstyle but for his ability to see broadly, beyond the small data to the way in which data work together. But science did not end with Einstein. It goes on, whether or not Einstein was right or even partly right. Einstein becomes a part of our lecture because of his wariness about quantum physics, a reserve that turns out to be worthy of address. There are many, many schools of thought in quantum physics, and here I will be reviewing the schools of thought following John Archibald Wheeler, Richard Feynman, John Cramer and Milo Wolff.

We are at the start of another new, amazing century, so perhaps it's time to step back and view the wider landscape of science to see where the

fault lines may be apparent. These fault lines are only apparent to those who can fly above it all and see the full picture. You need to be an eagle, rather than a rabbit, to get the bigger picture. And I have found such an eagle! Here I freely acknowledge the wonderfully coherent ideas of Milo Wolff in his book Exploring the Physics of the Unknown Universe, published in California in 1994. I recommend this book, but it's not for the faint of heart. It is not about technology but about real science, the basis of our amazing technology. At last I have found a candid scientist who can communicate! This he does, and his chosen subject matter is close to the Unified Field Theory.

Bear in mind the mindset in which we have become mired when thinking about medical biochemistry, the mindset where we have models of molecules as rigid and geometrically arranged structures, with bonds and receptors and orientations of surfaces and folding of regions. It is as if a molecule is some kind of mechanical arrangement, although, of course, very small in size. We have ions and electrons, too, and they make paths. Sometimes we have too many particles left over after a reaction in the body, and these have to go somewhere. We have mem- branes that allow the passage of some ions but not others. For the most part, physiology is based entirely on this kind of mechanically arranged action and interaction.

But from a different point of view, we have to ask why atoms and molecules arrange themselves in patterns in space and show all sorts of strange char- acteristics, like bonds and charge and different states. Of course, biochemistry is a derivative science and to answer questions about it we have to go to the mother of biochemistry, which is physics, the queen of sciences. And the language of physics is the queen of languages: mathematics.

The Landscape Outside the Medical Department is Very Unfamiliar

First of all, contrary to what you may have thought or been taught, the idea of the electron is by no means settled, and neither is the idea of the photon. If we can get to the bottom of this dilemma, then we will have made some real progress in uniting medicine with the source of its knowledge - physics.

The reasoning behind this approach is that electrons and photons are common ground for both biochemistry and physics, and in sorting this out, we might make some real leaps into the future.

The actual evidence for the particle concept is seemingly weak, even though it is universal in teaching institutions the world over. A central structure for the electron has never been discovered, although decades of effort have been made. Worse still, quantum mechanics cannot

mathematically account for the size, mass and charge of electrons. The idea of a particle's mass is made tenuous by the fact that mass can be converted into electromagnetic energy.[1]

If there is a particle called an electron, then it seems to make sense that it can be measured in terms of space and time. In this respect Werner Heisenberg said that there were limitations to measurements of the location or momentum of the electron, limitations related to Planck's constant.[2] As a result, there is an inherent fuzziness to the nature of reality, which has troubled many philosophers since the Heisenberg Principle was proposed. It means that if you know the momentum of a particle, then you cannot also know the position of that particle with equal accuracy. Naturally, many people did not take kindly to the idea of a science where you cannot know things. After all, the word 'science' comes from a root word meaning 'knowledge'. But what we really lose here is something we always took for granted - that a particle is a thing. We lose our common sense view of what we mean by 'particle'. And that, of course, is what quantum is all about at its very heart: particle-wave duality. But do we really need to resort to such paradoxes? Perhaps not.

So, paradoxically, quantum physics tells us that an electron or a photon is both a particle and a wave. The size of an electron, if it is an oscillating wave rather than a particle, is also the subject of some

1 David Hull, Darwin and his Critics, University of Chicago Press, 1983; ed. Phillip Appleman, Norton, New York, 2001 edition, page 260.

2 Ibid., p.138.

drama. Of course, if there is a quantum wave that makes a field, why can it not be detected? After all, we can detect wavelengths of light (photons) with our technology without difficulty. Or can we? What is the essential difference between electrons and photons?

Louis de Broglie, in the 1920s, put forward the idea of a matter wave produced by the electron and other particles, and although his theory was purely mathematical, evidence that he was right came a few years after his paper was published. He was later awarded a Nobel Prize for his work. The de Broglie wavelength is inversely proportional to the momentum of the particle, so an electron wavelength will be a million times smaller than that of visible light and something that no radio receiver machine can detect - the frequency is just too high.[3] Semiconductors will not function at that frequency - nowhere near it.

What do we know about the wave idea of an electron? Clinton Davisson and Lester Halbert Germer, in 1927, gave us some data about the electron: it obeyed the same rules as a photon.[4] When electrons were fired through metal foil (which had a crystal-like lattice composition) onto an X-ray photographic plate, there appeared sets of concentric rings, indicating the electron's wave properties. The measurements of the energy and momentum agreed exactly with de Broglie's predictions.

This experiment and others, such as the variations on the famous double-slit experiment that have taken place over the last several decades, clearly show that electrons and photons have wave qualities. So, we have to ask why it was historically that particles became the dominant way of expressing the idea of quantum 'things'. Much of this talk is concerned with addressing that question.

Physicist Milo Wolff provides as good an answer as any I have heard. Mass has to be at a precise point for the purposes of engineering calculations, so it is handy to think of electrons as particles. What's more, since all wavelengths smaller than visible light appear to our eyes as points, we have to blame our faulty perceptual apparatus. As Wolff points out, scientists have perceptual and emotional needs for particles. Waves simply are not so easy to accommodate in the psyche. A lot could be written about the psychology of science. Because we are human, psychology rules us as much as any other set of ideas does.

Perhaps it is a good idea to look deeper into waves and their qualities before we go any further. If waves can replace most particles, as Milo Wolff shows they can, then the wave nature of the quantum realm becomes the area we should be most familiar with. Our narrow education systems have left us with ideas in our heads that we must eventually discard. The only kind of wave found in our education systems is the electromagnetic wave type, which has one or two dimensions only: wavelength and time (if we use the accepted idea of Maxwell from the mid-nineteenth century). Practical people realised Maxwell could not be right and the wave ended up with wavelength and amplitude as well as time.

Yet a moment of reflection will reveal that there are also sound waves which are linear and can travel away from you or move towards you. There are also standing waves, as in a musical instrument, where standing waves exist on vibrating strings. Then there are radial waves, where the wave goes outwards in all directions at once, inwards in all directions at once, or, for example, forms a standing wave on the surface of a drum. And lastly there are spherical waves, like the out-wave from an explosion in three dimensions. In the whispering gallery we get a spherical wave created by the reflections of the gallery, where the waves are incoming. And we can have a combination of in-wave and out-wave, as in the cavity of a musical instrument, which seems to act as an amplifier. We are talking about standing waves of a spherical three-dimensional quality, and I ask you to think of a river in flood going over a series of rocks. This is where you will see stationary standing waves. The field (the water in the river) moves, but the structure (the rock) is stationary. This model is similar to the model adopted by Milo Wolff - of waves going out of and coming into an electron centre.

An important thing just happened: I spoke about waves coming towards you and going away from you, and you never flinched. Waves come and go? Back and forth? Why?

Another thing also just emerged that rarely emerges in the education system: I spoke about different orders of waves - some uni-dimensional, some two-dimensional and some three-dimensional. Scientists don't always describe the world in three dimensions, even though we assume that they are intelligent enough to do so. How many dimensions are represented by the Maxwell equations? Two.

As we all know, or should know by now, wavelength multiplied by frequency equals velocity, and different wave types are propagated at different speeds, from sound waves to light waves. Waves do not move unless there is a medium in which they can travel, but their function is to move energy from one place to another by a sort of displacement of kinetic and potential energy. All types of waves are related to the properties of space, curiously, even though they are vastly different. Electromagnetic waves are said to travel in space without medium, yet they do, in fact, have a medium - it is space itself!

Waves can also be polarised, which means simply that the amplitude is directional. Light is usually polarised perpendicularly to the direction of travel. Two polarised waves can get together to form a helix in space if they are oppositely polarised. But there is a specialised type of wave that has no direction yet has amplitude, and the amplitude of that wave is a number called a 'scalar'.[5] So we have a scalar wave, which, when combined with another similar wave going in the opposite direction, is said to be a 'standing wave'. A standing wave is transferring energy, yet it always stays in the same place.

From these waves we can get reflections of energy, partial or total, and also interferences called 'beats'. This is how your piano tuner tunes your piano - by listening to the beat frequencies. They are real. In fact, repeated reflection of waves off a surface can create standing waves in space if we have two waves of the same frequency confined in the same space … space in this case being the medium.[6]

The essential difference between different kinds of waves in physics, is whether or not they obey the same set of rules so far as speed of propagation is concerned. Here I remind you that while sound waves vary greatly in speed, electromagnetic waves travel at light speed, which is regarded as a fundamental constant of nature so far as energy transfer is concerned. So, while we know a great deal about the medium of sound waves and how that medium affects them, the medium of the electromagnetic wave, which is space, has hardly been investigated. Space does have qualities, and the study of it belongs essentially to quantum physics.

Here we come to the great divide in science. Most of the activity of scientists to date, in the realm of physics at least, has been to understand energy transfer. In the case of waves this is hugely important, and since we know that photons are the way in which energy is transferred between electrons, it becomes doubly interesting. But just suppose that instead of energy transfer, you wanted instead to study information transfer from one place to another in the universe. Here there is not so much knowledge, or even theory, available to us, yet it seems that the transfer of information is of equal importance to the transfer of energy in the case of living things. Even inanimate things such as chemical reactions rely on information transfer to trigger the reactions then stop them.

You may never have wondered how atoms and molecules 'know' how to react with one another. To even start to understand this, we must look at two things: linearity and modulation.[7] If you have an electronic circuit that acts like an amplifier, then it is linear if it produces output exactly in accordance to what is put into it. The graph of the input versus the output has to be a straight line, hence the word 'linear' - making a line. If the output is not proportional to the input, then that system is said to be 'non-linear'.

When non-linear amplification occurs in electronics, there is phase distortion, as well as distortion of the sine waves, which may produce unwanted harmonics. If two signals are mixed, then they each contain components of the other. One signal has information about the other signal. Information transfer occurs when there is non-linearity.

Our ears are non-linear devices, so we can actually hear the beats when there are two or more frequencies together in a standing wave, such as when you strike a note on the piano. The beats are the non-linear information responses caused by the mixing of two linear sound waves. There are not only beats, but harmonics as well, caused by the addition and subtraction of the basic frequencies of the sounds.

The extraordinary thing I have to relate is that all of the physiological processes of the body are non-linear. To check this, if you want to know more, any modern text on psychology or perception will do. Even specialists' books on biology will tell you that the body's regulating mechanisms are non-linear in nature. Non-linearity is the hallmark of a quantum system.

If the body has a control system - of energy and information - that is above and beyond the

biochemical one, then that is the one that should be treated by physicians, instead of the deriva- tive chemical one. From this point of view, the chemical model of the body is derived from the non-linear energetic one. So, when we want high-quality sound reproduction, the electronics must be as linear as possible; this is to minimise distortion. Yet, when we want instead to impress information onto a radio signal or a television signal, we need non-linearity to transfer information. Information transfer occurs due to the distortion of a wave pattern. This is called 'modulation' in technical language. It makes the occurrence of interference patterns in physics especially interesting, for that is where we will find non-linearity. And interference patterns are indeed there, in the realm of the super high-frequency field created by the so-called sub-atomic particles.

What has just happened is that we have made a huge link between the worlds of biology and physics, which then connects us directly to quantum mechanics. Why so? Because quantum mechanics is concerned basically with the behaviour of waves in space created by sub-atomic particles.[8] We already know a lot about the rules of engagement of these quantum waves in space: they can add to each other or cancel each other out. The result is that you get both allowable and non-allowable frequencies, rather like the harmonics that are allowed in sound waves.

The allowable frequencies are, in fact, represented by all the elements of the periodic table. Hydrogen, of course, is the simplest, being represented by a single electron with a proton (and with a spherical arrangement of the electron). This is how it looks at its lowest energy or frequency state. Once it reaches a higher energy state, lobes appear in the sphere, so we are looking at hydrogen as if it is a collection of standing waves in space. To get hydrogen, the waves must take the same path every time they move, to set up a standing wave due to the inherent amplitude pattern.

No, there are no orbits for quantum particles![9] The idea of orbits is over, finished and dead
-but it is still taught to every child in the world who learns science. What they should learn is that atoms are described by latitudes, longitudes and radii, all of which are needed to describe a place on a sphere. We can look at polar standing waves or equatorial standing waves, and all of them are related to amplitude. 'Amplitude' is just a word for the amount of disturbance in space a wave creates.

Physics explains nature from the very small to the very large, from the sub-atomic to the cosmological in terms of scale. As matter is grouped together in larger and larger lumps, we pass from the rules governing the particles of quantum physics to the larger realm where classical Newtonian physics takes over. We already know that the rules change as we go from very small to very big and it's called Logarithmic Scale Invariance. So both sets of laws apply to biology as well as to medicine.

Science, like God, works in mysterious ways, and one of the most mysterious has been the arrival of the photon as a sub-atomic particle. In the early twentieth century, light was shown to be able to form packets of energy, or 'quanta'. This was first suggested by Einstein and recorded in his photoelectric effect paper of 1905.[10] Even though there was not then, nor is there now, any evidence to show that light is, in fact, a particle, it was given a particle name ten years later. So it's still a particle!

Einstein gained a Nobel Prize for his photoelectric effect work, but not one for his later work on relativity. In fact, he was forbidden to mention relativity at his Nobel Prize acceptance speech, so he refused to attend it. The motion of matter was the basis of Einstein's relativity theory. Of course, this motion occurs in quantum physics, so it was natural that relativity was rather easily accommodated into most of quantum theory. Paul Dirac discovered, in 1933, that a different mathematical approach to the original Schrödinger equations meant that, magically, accurate values of spin and magnetic moment could be derived for the electron. This was really the beginning of quantum electrodynamics (QED), something that was later taken up by Richard Feynman, John Wheeler and others.

Nowadays, Milo Wolff asserts that physics should be concerned with just three basic 'particles', as we can call them, and these are electrons, protons and neutrons, with a charge of -1, +1 or 0, respectively. Of course, they also have other characteristics, such as frequency, spin and magnetic moment.

A great deal of enquiry in quantum physics is devoted to spin, which at its most basic can be explained as an angular momentum within the matter wave whose value is always a multiple of one half. Note that there are only two allowed directions of spin. A different spin means a different particle! This characteristic is still the subject of puzzlement in physics. But it has proven useful: it generated the

8 Ibid., pp.120 -21

9 tIbid., p.122

10 For the history of relativity, and of quantum electrodynamics as mentioned in this paragraph, see John S. Rigden,Einstein 1905: The Standard of Greatness, Harvard University Press, Cambridge, MA, 2005.

Pauli Exclusion Principle, the key to modern chemistry, which says that no two sets of interference waves (or particles) with one-half spin can occupy the same state together. This rule applies to the three basic particles, all of which have half spin. The idea is of such importance that it has determined the structure of the periodic table of elements; and here we can say that the periodic table itself is a map of the allowable frequencies in the system of wave interactions of particles.

Another set of rules for quantum behaviour is that of magnetic moment. This property is related to the spin of the particle and is a vector of rotation - but not of orbital rotation! It is, in fact, a measure of a sort of loop current flowing in the spherical arrangement of the atom. It is a curious phenomenon that is not well understood because, for example, the neutron, which is charge neutral, has a magnetic moment. This seems impossible; we are used to the idea of charge generating a magnetic potential. But magnetic moments are really just another measurement of the energy arrangement in atoms - that is all. They are obtained by placing the atom in a magnetic field, then measuring the spectral lines, which split in two. The difference between the two spectral lines is measured, with the difference representing twice the energy. That's all we know![11]

There are a number of letters of the Greek alphabet used to represent these variations of mass, spin and frequency. These variations are not discrete, because one can change into another in a fraction of a second. The world of so-called particle physics is truly at odds with the world as perceived by our senses. The lighter mass particles are bigger and heavier mass particles are smaller - a topsy-turvy world.

It also has to be said that although the word 'particle' is used in the language of physics, it has no meaning. Quantum so-called particles have no borders or boundaries. They do not have shape. Neither do they have specific locations.[12] Many of the so-called particles have fantastically short lives and cannot even be said to exist, if we can use that word at all.

By now you will be wondering, if you have had the benefit of a medical education, where the ideas of medical physiology can be placed in this new system of physics thought, which has developed in the hundred years since biochemistry itself was first born in the late nineteenth century. Now that Einstein has been dead a long time, it is time to reassess what physics really has as its foundation.

According to Dr Milo Wolff, there is a short list of basic laws that form the roots of the tree of our knowledge about how energy behaves. The details are much too technical for most people, so I will only list them, according to Milo Wolff, as follows:

1. Newton's Second Law of Motion
2. Coulomb's Law of Electric Charge Force
3. Newton's Law of Gravitational Force
4. Rules of Quantum Mechanics
5. Rules of Special Relativity
6. Law of the Conservation of Energy[13]

What is soon overlooked is that the underlying basis for these laws is not fully understood, so you can understand the puzzlement that scientists experience when trying to explain nature.

11 Milo Wolff. Exploring the Physics of the Unknown Universe. Technotran, Manhattan Beach, CA, 1990; 1994 edition, pp.149-50

13 Ibid., p.156

Qualities of Space and Effects on the Human Body

As Dr Milo Wolff says, the qualities of space itself have not been studied in any detail. I, like Wolff, had a great deal of curiosity about space, but did not much understand it. A chance remark by my colleague Harry Massey resulted in quite a remarkable insight. In 2002 I was in California, trying yet again to get some backing for my ideas on quantum biology. By that time I had already produced some early versions of what would later become NES Infoceuticals. Those early versions followed the well-worn path of the traditional Chinese acupuncture meridians, but the Infoceuticals are based on pure energy concepts rather than on the already existing analogues of the human body-field created accidentally by minerals and herbs of various types. I was talking to Harry Massey, hoping against hope that the project would start up soon, when I remarked that all we had to do was correct the structure of space in order to correct the behaviour of the human body and its complex chemistry, which so often goes wrong. And Harry said, 'Well, why don't we just do that?'

I realised that back in 1999 I had already tried to do that, but had not been able to imagine how it could be done so far as the technology was concerned. Then when talking to Harry in 2002, I suddenly realised that all we had to do was to measure how space was behaving when it was filled up by different frequencies. I thought to myself, 'Of course! It is the different frequen- cies creating the structure of space that are the trouble!' But then I remembered that they were the frequencies of quantum physics, which were supposed to be impossible to measure.

That thought did not stop me. I went out straight away and tried the impossible. I used the apparatus I had first created in Australia and simply began to measure nothingness! (See 'Overview of the Space Resonance Matching Method', p.71.) But I surmised that there might be ranges of frequencies in the decadary scale, and indeed, to my great surprise, sets of data appeared where, of course, there was supposed to be nothing. I was measuring space and how it was structured at different frequencies! So the discovery was made in the USA, at the insistence of Harry Massey.

I had always thought that the early versions of the NES Infoceuticals should work a lot better than they did, and of course when I added 'corrections to structure of space' to them, they began to work much more strongly and very much more quickly. Nobody was more amazed than I was. At the time, I did not quite realise what I had done, but it became clearer as the science unfolded about the nature of space and its relationships with matter. Of course, many of you who use NES will realise I am referring to the initial set of 12 decadary 'compartments' in space (which would become the Energetic Integrators of the NES system).

As you know, the compartments, which I will from now on call 'Integrators', are the information pathways in the body-field that the body relies on to know what to do. They go from very long waves of several kilometres to very short waves in the realm of infrared just before light. Just how and why the Integrators were so important for the functioning of the human body was of course at the time a big hunch that had very little reasoning behind it and could not be explained easily to anybody. In fact, I think it is fair to say that nobody knew what on earth Harry and I were talking about! But now the very latest physics is available to tell us that space is not empty but crisscrossed by many frequencies forming structures which are patterns of waves of the three major 'particles' - or waves, as it turns out in reality. Space is the medium through which these particle-waves are transmitted, and so space is able to affect them in a measurable way.

Imagine my surprise when in 2002 I found that the 12 Integrators of space were not only related to ranges of frequencies based on the decimal places, but also corresponded exactly to the 12 groups of Chinese acupuncture meridians! (I had been studying the traditional Chinese medicine [TCM] meridians since 1983 in my effort to understand the science behind acupuncture.) By the word 'corresponded', I mean that there was a direct match in my testing between the data for space at certain frequency ranges and the TCM meridians. I forgot to say that by then the 92 meridians (their energy fields) that I had spent so many years getting imprinted into sealed ampoules of liquid, had been simplified into 12 groups. This occurred when the Integrators were tested for matches with the 92 types of meridians recognised for thousands of years by Chinese doctors.

I was thinking that the meridians had a lot to do with the structure of space. I was, by then, working late

at night in a shed, and sometimes on the kitchen table, with a strange group of machines and some ampoules containing … nothing! (Actually, as I would learn, they contained imprinted information.) I had little income and few friends in the business, and nobody had a clue what I was talking about. But when I realised what was going on - something that of course took some years, with the human mind being so slow on the uptake of new ideas - I was quite amazed at my good fortune.

As far as my former colleagues in Australia were concerned, I might as well have been travelling up the Amazon looking for new tribes. Everyone I knew in the healing business was meshed into a system of thought that did not work very well, and very few people were prepared to abandon their worldview and replace it with another - not without substantial evidence. All I had was experimental techniques that came up with sets of data, none of which anyone could quite get their head around. That kind of data is not considered 'substantial' data. However quantum physics helped explain what I found in all those quirky experiments. I shall outline the physics in the following sections.

Correcting the Errors of the Past: A New Model

The Transactional Interpretation of Quantum Mechanics (QM) was proposed in the mid-1980s by John G. Cramer, of the physics department of Washington University.[14] His theory was an advance at last on the Copenhagen Interpretation of QM and dissolved some of the paradoxes and willing schizophrenia associated with it. The Copenhagen Interpretation, which was based on Niels Bohr's work, as generally conceived also included the ideas of Werner Heisenberg, dating from 1927, and the Uncertainly Principle, which left us with a universe we could not know about with complete accuracy. It resulted in the statistical model as the basis of reality, from Max Born's work in 1926. It also involved the concept of wave-particle duality, and raised the question of measurement (in physics, measurement can cause the 'collapse of the wave function').

Cramer theorises that waves are real (and particles may not be), and he gets, of course, to that most thorny of issues, the non-local effects, which are also often called 'action at a distance'. Non-locality, to put it simply, is a way of just saying 'information transfer'. Change something in one of a connected pair of particles, and the other particle changes instantly, no matter how close or far apart the two particles are. So, one particle can 'know' what another particle has done or is doing, and perhaps what it will do as well. Paul Dirac, John Wheeler and Richard Feynman were all physicists who used the idea of a 'transaction', or a dynamic interaction taking place in space with respect to the alleged 'entangled' particles.

Once we are allowed waves, then they can be outgoing or ingoing and can be used to describe quantum interactions where information transfer is occurring. Cramer arranges the waves so that an excited electron can send out an emitter wave, which is of one dimension only, so it's linear. There also is a 'confirmation' wave that comes back the other way. This double event is called a 'transaction', which, of course, occurs in space-time. This theory can be seen as an attempt to correct errors of the past which were still causing trouble in 1986, even though the idea of out-waves and in-waves had been current since the mid-1940s, when Wheeler and Feynman had popularised them.

What was really needed, however, was a completely new model, based on the Cramer model but applying to three-dimensional reality and

leaving behind forever the one - and two-dimensional worlds invented by physicists to make their lives easy.

Another physicist, Milo Wolff, began to wonder what was the origin of the de Broglie wavelength (a frequency, you will recall, emitted by all particles that was discovered in the 1920s). He proposed a new interpretation of quantum, one based almost entirely on waves in space, where the properties of space are the basis of all physical laws as well as of matter. In effect, this interpretation does away with the need for almost all of the current 500 particles!

Our education has left us with the notion that space is empty, but there is no such thing as empty space. It has characteristics. My own experiments, over the years from 1990 to the present, led me to think that space was capable of some amazing things. I had by this time snatched data out of space that when added to Infoceuticals greatly increased their effectiveness. Space, I have found, has the ability to store energy when it acts like a capacitor and to alter its ability to allow things to pass through it, which I call 'permittivity'. And this is because space has the ability to form resonances between standing waves. Other interesting experiments have shown that space has memory and that the memory of information can last a very long time - months or years. Wolff also talks about the density of space - how much electromagnetic infor- mation it holds in the form of waves.[15]

By the time I found out about the Wolff model, I had already formed many ideas about the electron, its apparent structure, and its information-carrying ability. But nothing had quite prepared me for the shock of Wolff's idea of an electron: that it has one centre and two sets of scalar waves, one set moving outwards and the other, at almost the same frequency, moving inwards. The electron can be said to be in space, in the centre of the rings, which are, in fact, little spheres, as the electron goes into three dimensions. The spherical waves go on forever, lessening in amplitude as they travel, but the central part of the electron stays where it is, a stationary spherical wave. At the centre of the electron, the waves change their phase, making for some very interesting possibilities so far as information exchange between particles is concerned.

To be blunt, if you don't have any action at a distance, then all information exchange can only be achieved by the atoms rubbing up against each other. No human body-field is possible and, as no cell in the body is able to know what every other cell is doing, regulation of the organism is clearly impossible. Somehow huge amounts of data have to be made available very rapidly to every cell in the network for biology to exist. A pure wave model makes such action at a distance more possible.

To return to the electron, we have all been taught that it is negatively charged. Not so. There is no evidence that the electron is itself charged.[16] Yes, there is charge associated with it. But electrons have no specific charge at all; in fact, there are at least 15 different levels of negative charge possible! Wolff recognised this fact and wondered whether it was the space around the electrons that was charged. I mention this in case you are a biochemist with ideas about the charge of ions.

Wolff's model is the only bit of physics I can actually relate to after years of battling with turgid and incomprehensible texts by academics. The whole point about his three basic particles is said to be energy exchange, but as someone interested in the body-field and healing, I am interested mainly in information exchange, the poor relation in physics. However, to my amazement and delight, the two occur together in Wolff's theoretical model.

Once two space-resonating systems get together, there has to be something that indicates that an event has taken place. This event is the mutual recognition of similar information systems, the core of the science I have been pursuing for many years. When two systems of space - resonance communicate, there is an energy exchange, and this event is expressed in the form of an ever-so-small frequency shift that also indicates that the permittivity of space between them has changed. This is the basis of my whole technique, and initially was my only one for studying what happened in information systems in a field. Later, I did tests to show that a small frequency shift did occur.

So naturally when, late in 2005, I read Milo Wolff's book, I ran to my laboratory to see what happened when there was a complex 'match' between information systems. Would there be any change in the data I had been measuring for many years past? Until then I had found that nothing could alter the data, so I was completely delighted to find out that both data sources changed - one increased a little, the other decreased a little - when a match was tested. The action of the match was enough to change the data!

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15 Wolff, op. cit., p.188

More amazing still, was that when the experiment was over and the carriers of information were retested separately, they had actually reverted to their original data! So it appears that electrons have memory! They remembered what data they had contained before they were matched. Physics can be fun!

The extraordinary thing was that I had always thought that the space in the vicinity of the match testing, was what actually caused the change in the galvanic skin responses of a person connected to the machine that did the space resonance matching. Human body-fields are extremely responsive to what is in space around them. This is no news to anyone except most biology academics perhaps, but it is also a key factor in health and sickness.

Human body-fields are also very responsive to the radiation around them, and I'm not referring just to sunlight but to a whole range of radiation. So it is not surprising to find that Wolff suggests strongly that a very old idea, suggested in 1922 by Tetrode, actually may be correct.[17] Tetrode thought that radiation was an energy-exchange mechanism. The resulting idea actually is quite well known: oscillators are able to couple via their space resonances. According to Wolff, the three major particles are dual oscillators, sending out frequencies and receiving them at the same frequency. The results are coded in the central part of the electron as a phase difference between the two waves. The various other particles and appearances, such as light, are put down to effects created by the wave interactions of the three major particles.

Once I found this out I was quite relieved, as there was absolutely no explanation in conventional physics for the fact that visible light carried the information I am convinced is required by in the body-field information model I have built up. If the photon is nothing but an appearance caused by interference patterns of electrons, then one might think that it will not be part of the major information system. But all living things as a matter of course are known to emit photons if there are electrons present of the right frequencies to cause the creation of photons in the realm of above visible light frequencies. These emissions are in the ultra-violet range.

So, to be as clear as possible, the energy exchange takes place via the matching of space resonances, while the information exchange occurs in the standing waves of the three major particles - electrons, protons and neutrons. When there is an energy exchange, there is also an information exchange. You can't have one without the other.

The information the body wants is distributed in the standing waves of the electron, neutron or proton. The actual centre of the electron is a very dense piece of space - the link between the in-wave and the out-wave.[18]

The great thought experiment of 1935, called the Einstein, Podolsky, Rosen (EPR) Experiment,[19] showed how certain science disciplines disregard data they disagree with - at least initially. The experiment eventually ended decades later in results that confirmed the quantum paradox of non-locality, or action at a distance. What do these results also purport to show? Simply that while the speed of light is the outer limit for energy exchange, information exchange (presumably at the centre of the three particles) is apparently instantaneous, even over large distances. The word 'apparently' is important, for information exchange isn't quite instantaneous. If information exchange can only properly occur when there is energy exchange, we have to really modify our thoughts and say that one part of information exchange is instantaneous - the out-wave part!

Remember, the wave of the Wolff model is a standing wave in space and is therefore able to act as though it were the medium of information exchange. Most people have no trouble with the idea of the out-wave, but may doubt the existence of the in-wave.20 The best I can say is that its existence stands to be proven, but it works beautifully in Wolff's theoretical model. To understand the reality of the in-wave we need to go a little further. Milo Wolff conceives of the electron as a single oscillator which in turn means that the electron is oscillating as to frequency and phase at its very centre. The out-wave cannot exist without the corresponding in-wave, to obey the Conservation Law. In a standing spherical wave, the oscillations are not like a water-jet going into space; they are more like a wave in a river, which always appears to be in the same place. The photon is a double-oscillating electron where the centre of the electron divides when it is energised.

Here is another factor to consider: all chemical reactions must result in a slight change of frequency of the atoms taking part in the exchange. If some chemical reactions advance the phase of the

17 Ibid., p.199

18 F. A. Popp, Consciousness as Evolutionary Process Based on Coherent States, International Institute of Biophysics, 2003; http://www.lifescientists.de/publications/pub2003-04-11.htm 19 Wolff, op. cit., pp.140-43

19 Wolff, op. cit., pp.140-43

surrounding field, then the Law of Conservation of Energy demands that other reactions will have a similar effect in retarding the phase. Phase and energy state are related ultimately. Put them together and chemistry, even biochemistry, is related to both frequency change and phase change. Any effective medicine would be in charge of making sure that frequency and phase are correct in the case of all of the body's chemical activities.

Frequency and phase represent the extent to which chemical reactions can influence the health of the entire body organism, rather than just one part of a cell, or even a molecule. So orthomolecular science is right on the verge of looking into what controls the 'ortho', which is, of course, the field surrounding the chemical reaction. 'Ortho' simply means 'correct'. Every orthomolecular doctor is on the verge of taking a revolutionary step - into quantum field energetics.

A Comedy of Errors in Quantum Physics, 1850-2006

As I mentioned earlier, I had never been able to pick up a physics book and read it with interest until I came across the work of Milo Wolff. Wolff does a lot of smooth driving along the rocky road built for us by previous luminaries of quantum mechanics. So, here is a brief history of how quantum physics developed, missing the point of resolution of inner conflict again and again. It helps us understand why physics and biology as theoretical and practical sciences are not only poorly integrated but actually in conflict.

Max Planck

In 1900, Max Planck initiated a physics revolution by making a momentous observation concerning the behaviour of what is called 'black body' radiation. This radiation could not be explained by the prevailing ideas of how the radiation of electromagnetic waves functioned, something owed to Maxwell, who 50 years or so before had described electromagnetic-wave propagation with a series of four equations.

Planck observed that the energy radiated from a black metal box behaved like little packets rather than like continuous waves, and the word quanta, from Latin, was used to describe these packets of energy. Planck astonished the scientific community by proving that a constant (now known as Planck's constant) was required to correct the errors that were observed as differing from the predicted behaviour of the Maxwell equations. It is, in fact, not a very large number, but because its influence grows as frequency grows, it can be of great importance in practice. The great law found by Planck is:

E (for energy) = h (the constant) multiplied by f (frequency of the wave, or particle)

The great controversy of the last hundred years in physics has been because of Max Planck's simple need for the correction of an energy formula. It led to no end of trouble.

Albert Einstein

By 1905 the unknown clerk in the Berne patents office had used Planck's new arrangement of energy to explain the photoelectric effect, a very puzzling phenomenon which can best be explained by saying that metal (and other substances too) can emit electrons when it absorbs photons. This does not seem to be a problem now, particularly if you don't think about it much, since

until recently no one could understand how a photon could be ejected by an electron … or how an electron could absorb a photon. The problem of emission and reabsorption that occurs in atoms remained a problem, one that was not addressed properly until the last 25 years. For most of the last 90 years physicists worried about transfer of energy in-waves and packets.

Since Newton's time, the wave nature of light had been accepted by science practitioners, at first most grudgingly. The idea that little packets of energy could occur was quite a heresy, because the continuous wave nature of light, accepted since the pioneering work of Newton's optics, entertained only the wave theory. Yet even in the eighteenth century, the packet-of-energy idea had been greatly advanced by the construction of little light windmills, ones that still are made, where in a partial vacuum the blades of the windmill, bright on one side and dark on the other, are seen to turn every time the apparatus is placed in strong light. Of course, the light packets are hitting the bright blades and being absorbed on the black side, so making the windmill go around … or so it was thought in the eighteenth century and beyond. Something with mass hits the blade, you see. So it moves the blade, you see. But you don't see at all! The effect is apparent. We may not need to have what we might call the 'itinerant' particle at all! And that is really what this lecture is about: how particles don't move, yet still communicate with each other.

Einstein, in his long and productive life, never warmed to particle physics or to the current quantum particle theory. He admitted that he did not know why light appeared to behave like discrete particles. He never named the photon; it was, in fact, named by someone else ten years after the publication of his 1905 paper. Now you know why: he may not have believed it was a particle. He said that he did not know what it was.

Unfortunately for us all, few scientists would drop the idea of waves, perhaps because of Newton, and others balked at the idea of particles on their own, so the duality of wave and particle began. Neither could be entirely right, yet matter appeared to act like one or the other depending on the circumstance.

Einstein was there just when the idea of how the atom was arranged was still open to question. Provisionally, he finally adopted the idea of particle-like packets, because of his work on the photon and the electron, and hoped later in his life to describe how these could be united in a new grand theory involving continuous force fields projected through space. As it turned out, he never found a grand unified field theory. Perhaps more tragically, he never needed to! In fact he himself realised that his quest was in vain.

From our vantage point in 2006, the 100-year-old wave-versus-particle controversy in physics may have been nothing more than a wild goose chase that consumed the lives of many scientists, yet we are still beset by the four energy forces in the universe (electromagnetic fields, gravitational attraction, the weak force and the strong force). The most troublesome of these

forces is gravity, which exasperates physicists by acting instantaneously. Furthermore, because no gravity particle has ever been found, gravity has been accepted by many physicists as somehow inherent in the mass of atoms themselves. Now it is entertained that it is just the fabric of space.

There are particle-physics specialists everywhere, yet not one of them has ever seen the particles they study. The 400 or more particles now with us as a result of basic particle-physics research are supposed to be moved around by the four forces I just mentioned. These particles are supposed to have spin, magnetic moment and other characteristics. A field is supposed to be created when one or more of these particles moves from one place to another under the influence of the forces. What creates the forces? Not known. Unfortunately, these forces have never been fully united and their origins have never been explained, not even after a century of the best brains on the planet, including Einstein, working on it for their whole lifetimes. Even as a failed scientist (because he failed to achieve unity in science), Einstein managed to attract enormous acclaim for what he did discover. Still, to his great credit, he never accepted the idea proposed by some quantum physicists - and a quite baffling idea it was - of the apparent randomness of the behaviour of the quanta, or the groups of particles. He could never accept, perhaps rightly, that there was no underlying law relating to the behaviour of matter. His most famous quip is still worth invoking here: 'God does not play dice with the Cosmos.'

So the legacy of Einstein and others is that matter behaves sometimes like a wave, with one set of laws, and at other times like a particle, with another

set of laws, perhaps even more puzzling ones. But this view has recently been changed in one respect: it can now be said, from experiments by a group of Indian scientists in the 1980s, that matter behaves not so much like one or the other but like both at the same instant of time.

Niels Bohr

The idea of the particle, rather than the wave, being the basis of reality began in the days of Niels Bohr, who decided that waves were somehow 'unreal', while particles, or packets of energy, were somehow more 'real'. This gave us two universes to explain instead of just one, and the idea of a 'real' universe and an 'unreal' one is still with us. Bohr taught for his whole life that waves in quantum were not 'real' waves. Waves and particles were supposed to be incomplete descriptions of matter that were somehow complementary, and this problem could be overcome by using mathematics - or, worse, statistics - to describe the material world. This is called the Copenhagen Doctrine, since Bohr was Danish. It is just that - a doctrine.

During the twentieth century, direct observation of the sub-atomic nature of matter was not possible, so observation was replaced by statistical models, and observation of the quantum behaviour of matter at normal room temperatures and pressures and at low energies was never considered possible. Heisenberg even came up with an Uncertainty Principle, which discou- raged scientists from attempting to set up direct measurement experiments from 1926 onwards. Low-energy particle physics was doomed from the start. Today there are no low-energy particle physics departments, only monstrous high-energy accelerators.

Erwin Schrödinger

Like many nineteenth-century scientists before him, Erwin Schrödinger believed in 'real' waves and said so very famously: 'Particles are just Schauenkommen [appearances]. The world is given to me only once, not one existing and one perceived. Subject and object are only one.'

In retrospect, Schrödinger showed his greatness in that he not only greatly distrusted quantum mechanics but also developed the distinction between the electromagnetic wave model of

Maxwell, which was two-dimensional at best and emanated from uni-dimensional data, and the newer idea of the standing scalar wave, which had three dimensions and therefore three axes. As we shall see, there was much more to know about scalar waves. Schrödinger's ideas were never pursued after 1938. But it seems he may have been right.

Louis de Broglie

Astonishingly, on his first entry into science, Louis de Broglie wrote a degree paper that won a Nobel Prize in 1929, after which he returned to the honest pursuits of an aristocrat. His paper was about matter waves and their frequencies. Electrons, he theorised, were not so much particles as waves of only certain allowable frequencies. So it has been accepted since 1929 that electrons do have specific wave - and that means frequency - properties, but due to the politics of science, we do not have departments of wave physics dotting our countryside but departments of particle physics.

In his Nobel Prize speech, Louis de Broglie said:

> ***'Determination of the stable motion of electrons in the atom introduces integers, and up to this point the only phenomena involving integers in physics were those of normal modes of vibration. This fact suggests to me the idea that electrons too could not be considered simply as particles, but that frequency must be assigned to them also.'***

De Broglie's ideas turned out to be of greater significance than at first appeared, when late in the twentieth century his work was revisited with interesting implications, which I shall discuss below. It turned out that de Broglie waves could be seen as the result of a Doppler shift effect created by two other waves!

De Broglie also did not like the recourse to statistics in understanding matter, as envisioned by Bohr. He suspected, as did Einstein, that statistics covered a multitude of things that might actually obscure efforts to understand the structure of matter, commenting that statistics, in the assessment of the structure of matter, 'hide a completely determined and ascertainable reality behind variables which elude our experimental techniques'.

So it is of great importance to note that de Broglie, Schrödinger and Einstein were all very unhappy about the development of quantum theory even from its earliest days. None of them liked the idea of a paradoxical universe where there was apparent randomness in the behaviour of what was then considered to be particles. Even in 1954, when he was close to his end, Einstein was still quietly backing

wave theory. On a website devoted to Milo Wolff's work there is something that Einstein might agree with:

> ***'Experiments on interference made with particle rays have given brilliant proof that the wave character of the phenomena of motion as assumed by the theory does really correspond with the facts.'***[21]

On the other side of the story, the scientists Max Born and Werner Heisenberg pursued the idea of a probability wave, one constructed from a statistical idea of uniting wave with particle. Heisenberg had famously issued the directive that we could never 'know' or 'measure' the position and velocity of a particle at the same time with e qual accuracy. Could this be because the particle did not, in fact, have a velocity in the way they imagined it? No one ever said that, so far as we know.

Surprisingly, the dictum of Heisenberg met with little resistance and ended up in every textbook, even though it denied the one true hallmark of science: insistence on the direct observation of data to form the basis of scientific thought. It is curious to develop a theory saying that something can never be known. It gives us insight into the quiet desperation of the quantum physicist, but little else.

So why did the particle appear to win over the wave, even though de Broglie had been honoured for his stunning work on waves? We have to put it down to the gratuitous discovery by Born, in 1928, that the square of an element of the quantum wave equations of de Broglie, produced mathematics that could apparently predict the place where a 'particle' might be found.

The wave-theory people suffered another setback in 1936, when Einstein backed Born's statistical interpretation of the structure of matter. By then Einstein had developed the idea that the four force fields could be extended forever in space and could, therefore, accommodate the idea of waves and particles in a statistical matrix. Yes, he was con- tradicting what he had said earlier in his life, but he was the first to consider the idea of a matrix of force fields in space and was even led to wonder what space actually was.

Paul Dirac

If you are looking for a sensible physicist, you need look no further than Paul Dirac. He acknowledged in 1974 that Born's statistical idea from 1928 was universally accepted, but also said:

> ***'I must say that I do not like indeterminism. I have to accept it because it is certainly the best that we can do with our present knowledge. One can always hope that there will be, in the future, developments that will lead to a drastically different theory from the present quantum mechanics, and for which there may be a partial return to determinism.'***[22]

Dirac thought that the electron was a wave structure without particle characteristics. And, in fact, his desire, expressed 30 years ago now, was realised in the last decade in several ways by several people. Now we have time to examine the proposed solutions to the impasse that quantum physics trapped itself in from 1900 onwards, with more and more rails being con- structed around the corral and with little effect when it came to satisfying those who desire a sensible orderly universe.

Richard Feynman

With Einstein long dead, the search for a unified force-field theory languished somewhat and particle physics became blighted by endless confusion. As Richard Feynman, no stranger to exasperation, said, 'I think it safe to say that no one understands quantum mechanics' and 'Science is the belief in the ignorance of experts.'[23]

Feynman made a dent in the randomness of the matter theories of quantum mechanics by developing to a higher state of perfection the ability of scientists to predict correctly the position and apparent velocity of quanta. He developed a system called path integral calculation to predict the expected location of a quantum of energy. Yet the mathematics proved very trouble- some and Feynman himself acknowledged in 1985 that it was a cause of some distress. The solutions to his calculations frequently included infinities, which had to be cancelled in a process called 'renormalisation' - perhaps a sign that something was wrong with the theory in the first place!

Even greater than his path integral approach, however, was an idea of Feynman's that finally enabled quantum physics to move out of dry gulch that physicists had entered in 1900 or there - abouts. This dry gulch was the idea of a real world accompanied by what Plato had called 'shadows of reality' in the Republic. This idea of a real world with an accompanying so-called virtual world was not intellectually pleasing in ancient Greece, and is

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21 www.spaceandmotion.com/physics-Niels-Bohr.htm#Einstein.Quantum.Theory Article: Albert Einstein on Quantum Physics, by Geoff Haselhurst, Published on his website www.spaceandmotion.com

22 www.spaceandmotion.com/physics-Niels-Bohr.htm#Einstein.Quantum.Theory Article: Paul Dirac on Quantum Physics, by Geoff Haselhurst, published on his website www.spaceandmotion.com

23 Richard Feynman, The Pleasure of Finding Things Out, Basic Books, New York, Apr 6, 1999, pp.186-7

not now. I call it the dry gulch because it was not a fertile idea and led nowhere. After all, physics is supposed to be the study of the physical world, while metaphysics is concerned with the so-called virtual world, the 'shadows of reality'. But if something is real, it can be measured, even if not always directly. And we don't want two universes. We don't want different degrees of reality.

Yet what if we could accommodate a matter structure that allowed for all of the good science of the last century, as well as suggested some interesting possibilities for the next? That is what this article is about, and Feynman helps us get there.

Feynman's new idea came from studying H. A. Lorentz's theory of the electron. Lorentz had proposed an electron structure theory in the very early part of the twentieth century and been awarded the Nobel Prize for it in 1902. In around 1945, Feynman, along with John Wheeler, updated Lorentz's idea by replacing force fields with the idea of a spherical electromagnetic wave, a wave that Maxwell had decreed was two-dimensional. Because of its electrical origins, the new area of physics that resulted from these ideas was quantum electrodynamics, and it assumed that there were particles that were being moved around by something. The something was a field, and Feynman was so successful with his new concept that he received the Nobel Prize in 1965.

Feynman thought there had to be an in-wave and an out-wave in the particle - or wave, as we might have called it. The spherical wave was certainly new and quite different from the familiar sinusoidal wave of popular electronics. In fact, there are no solutions to Maxwell's equations that can be placed in a spherical wave pattern. The spherical wave was also a stationary or stan- ding wave; that is, its velocity relative to the observer was zero.

The ideas had moved from two-dimensional waves to three-dimensional ones, but Feynman had overlooked one important thing: Schrödinger's idea of using a 3D scalar wave instead of a 2D Maxwellian wave. Feynman would not abandon the particle as a concept, although he did see the problem as perhaps merely a linguistic one. But something had happened at last. Better results in practice were obtained from Feynman's concepts and his stature grew. However, he was still a long way from the idea that was to emerge in the 1980s, an idea which curiously mirrored the view of physicist William Clifford, who in 1876, just after Maxwell delivered his famous four equations, declared that matter was undulations in the fabric of space.

We have to ask, since all the clues were there, why did it take so long for physics to move on in its understanding? Isn't it obvious that matter is three-dimensional at least?

If we look at the problem from the point of view of the physicists themselves, you can understand their dilemma. Maxwell described momentum versus time in his equations. This is possibly uni-dimensional if time is not seen as a dimension. This understanding apparently got confused in the end with Hamilton's half-wave mathematics from the century before Maxwell, where frequency versus amplitude was described—in other words, two dimensions. If three

dimensions were to be used to describe matter, it would involve an enormous amount of rearrangement of the deck chairs on the Titanic. By this, I mean that physics is concerned here with spin, charge, magnetic fields, velocity, mass and amplitude, and all have to be accounted for in a model of the atom and its particles or waves. So although Feynman's move to three dimensions was obviously needed, it took some rethinking to do it!

Feynman had to tread carefully so as not to upset the chaps in the profession. There are holy grails in science, or holy cows depending upon how you view things, and one of these is called cause and effect. This is usually conceived of as a time-related phenomenon, so that cause always precedes effect. When it doesn't, some people get restless. This means, of course, that any model of matter has to account for one thing happening after another in a time sequence. Feynman's idea was great, but it had a serious flaw, for it couldn't account for the arrow of time.

Dropping particles entirely was not to Feynman's taste, and it was not until experiments on quantum superposition were carried out and it was clearly shown that a particle could 'appear' in two different places at the same instant of time, that the game was up for the particle theory. That forced us back to Schrödinger's great statement that particles were Schaumkommen - appearances. They appear and then disappear; that is known, of course, to be true. But it is very hard to build a universe out of things that come and go without apparent reason. So is it logical to ask if particles might simply be manifestations of energy exchange occurring somewhere else?

In science, nothing changes unless there is a compelling reason for it to do so, for reasons of logic and harmony and mathematical necessity. But it does change on the basis of observed events in nature, and there was about to be a profound change in the most basic part of a basic science.

Milo Wolff

In 1986 Milo Wolff discovered an important correspondence in a key area of quantum theory not previously noticed: a mathematical coherence between the characteristics of a spherical scalar wave and the existing mathematics done by de Broglie on the matter wave of the electron. Remember, de Broglie had found specific frequencies for the electrons of each element.

No progress is made in science unless the newer idea explains things that the older idea cannot, so how did the idea of using a standing scalar wave with de Broglie's mathematics of the electron fare in this respect? Very well! Wolff had noticed that the sum of the out-wave and in-wave in Feynman's QED physics model equalled the frequency of the electron noted in 1929 by de Broglie. This made QED more solid than before. Could it explain the transfer of energy, the basic reason for there being quantum physics in the first place? Yes! The energy transfer appeared to happen by way of resonant coupling in space between two oscillating systems. At present it appears that the Wolff model is able to satisfy, in terms of mathematics, the following physics laws or principles: conservation of energy, quantum theory, Dirac's equation, QED and Feynman diagrams, special relativity, electric charge and Maxwell's equations and Newton's Second Law of Thermodynamics.

Here is what is really new about the Wolff model: there are two points from which spherical waves are produced. In the case of the electron, these two points are in the same place. So that makes four waves possible in cases where the points move apart because of the simple phenomenon of heterodyning. Heterodyning is a system of alternating currents of two different frequencies that are combined to produce two new frequencies, which are the sum and diffe- rence of the original frequencies. To put it more simply, it means that two oscillating waves,

when mixed, will produce four waves. This does not happen at rest, because the in-wave and out-wave are at the same frequency. This frequency stability or rest period changes when information is exchanged.

Frequency change in an oscillating system means heterodyning will occur. All through my experiments over 25 years, I have found sets of four waves appearing in my data. This is why I found them, I have no doubt.

If every particle depends on every other particle for its existence, then we must have a system, such as envisaged in 1883 by Ernst Mach, which allows for intercommunication among all particles in the universe. Wolff liked this idea because of his background in astrophysics. He could see the big picture. So he attempted to solve the time problem by giving all particles an oscillatory system that could keep time.

Again it has to be remembered that gravity, inertial force and magnetic fields affect other things instantaneously and do not, as it were, travel around at the speed of light. This gives some inkling that they are inherent somehow in matter. So Wolff had to find somewhere in his model where they could be expressed. Let's look a bit further...

A Walk through Wolff's Space Resonance Theory

The new Wolff model has two spherical waves, one moving outward infinitely and the other moving inward towards a central point. This central point is where one imagines the electron to be. These two waves set up an oscillation at a certain frequency, and this in turn makes a space resonance that is able to interact with other space resonances. Quantum theory gives us the following simple formula:

$$\frac{\text{F (frequency) = m (mass) multiplied by c (speed of light)}}{\text{h (Planck's constant)}}$$

The two waves form a standing spherical scalar wave. Spin occurs when the reversal of the in-wave occurs at the central point, where it becomes the out-wave. There is a 180° phase shift possible in either direction. The spherical standing wave provides us with two types of electrons, because there are two ways of superimposing in-waves and out-waves. This gives us an electron and a positron, representing two types of charge, and they can annihilate each other. Energy exchange takes place due to these space resonances. If one oscillator increases in fre- quency, the other one decreases, according to the Law of Conservation of Energy. This is the manner in which energy exchange takes place.

Space, which is called a 'vacuum' in physics jargon, is not something with nothing in it. It has density because of the matter waves produced by all the matter in the universe. According to the Wolff model, an electron is a change in the space density at the centre of a spherical wave.

By now it will be clear that a frequency shift also means an energy change to a higher or lower value. This shift occurs when there is an interaction between particles, and this effect can take place over a distance because the exploratory out-wave has infinite extension.

A characteristic of the Wolff system is that the 50,000 waves which might be found in the atoms of a molecule in a biological system are able to bind together and form a simple unity, making a simple waveform characteristic of that compound. Nature simplifies itself to become efficient!

The question arises for companies like NES Health whether or not this electron model is useful for gaining a new understanding of medical pathology. The answer is 'yes' if the change in frequency is matched, as it must be, by a much greater phase difference at the central high-amplitude point of the electron's existence. The frequency changes themselves are not great. Some of these phase shifts, as well as the places within the Integrators where certain cells belong, have been catalogued by NES, a task which took many years. We have found that all normal tissues and cells of the body can be assigned a value, in degrees, between 0 and 15. For the non-technical reader, we have to say that phase is about the coordination between waves - how and where they fit into space. Waves are 'in phase' when they fit together, and they fit together right at the most space-dense part of the electron, neutron or proton.

So it is worth reporting here that NES research so far shows that as frequency and phase change to higher values, therefore increasing the energy of a biological system, the severity of some diseases increases. For example, greater and greater phase errors may explain the difference between primary and secondary cancers. As the phase reaches a higher level of error, the phase matches to tissues that can be represented by that phase error. Because bone marrow and liver cells, for example, are very high in the phase error stakes, secondary growths will likely appear in those places. The cancer does not have to be transported there by any medium other than the unseen matter wave.

We can also attribute errors in the diagnosis of cancer to the phase shift effect. For example, it has been found that cancer is always of a mass and temperature different from the surrounding tissues, indicating that a phase error may lay behind this and many other pathologies that are hitherto unexplained. In this respect, the in-wave is of great interest in the development of a theory of quantum medical pathology, since it relates to the completion of an interaction with another wave, which will be the equivalent of a chemical reaction.

Phase is also very likely to be disturbed due to variations in the gravitational and magnetic forces affecting the electron. In therapeutic practice, complementary medical practitioners have called this effect 'geopathic stress'. It has been found by preliminary NES research to be a key factor in bioenergetic pathology.

How can the Wolff model change medicine? We are left with two worlds and both of them are real. The first world we already know a lot about: the laws of physics, the five senses, laboratory instruments and time-related events. The second world is that of the scalar wave interactions that are taking place all over the universe as a spontaneous activity of matter. Energy is exchanged only when the out-wave reacts, so far as frequency is concerned, and the in-wave is affected as well. This unseen but real world affects what happens in the directly observed world. In the scalar-wave world, matter has 'knowledge' of the state of other pieces of matter. Without that, no chemical reaction could take place - ever! The waves also set the universal clock so that cause and effect can be determined.

The Wolff model means that it is at last possible to conceive of a biological control system based on field interactions of the scalar wave. In therapy we need not try to alter frequencies, because they are determined by the matter itself and where it is located on the periodic table. However, it should be possible to correct phase errors between the in-wave and the out-wave, since it may be that the density of space is altered by a phase shift which can lead to pathology. Every cell in the body, and in all biology, has a characteristic phase value, and these are used as identifiers in NES technology. Pathology results from the phase error being greater than or less than normal. This shift may be only a matter of several minutes of a degree. NES Health has, since 2000, developed a 12-set group of space-frequency correctors called Energetic Integrator

Infoceuticals, each based on a range of 15° of correction, which is, of course, cumulative; there being 12 of them, we get to 180°, after which the system ends for that type of particle - the electron. After that we get the photon.

I have found experimentally that the human body particularly dislikes, or tolerates badly, a phase error of 90°, and this error is responsible for many disease states hitherto not amenable to any form of therapy. Why does the body not like 90° or, for that matter, 180°? These angles represent intersections of planar waves such that the body-field wave can be cut off, therefore impeding information flow. NES Health can begin to address these types of phase errors through the use of therapeutic mixtures we call Energetic Terrain Infoceuticals and Energetic Star Infoceuticals, as well as by way of the Integrator Infoceuticals.

NES Health and Quantum Scalar Waves

If there is, in fact, as Wolff claims, a pair of standing scalar waves equal in frequency to the de Broglie wavelengths for the electrons of various elements, then surely there is a way in which these waves can be read. They will represent not only the electron but the entire particle zoo that grazes near the atom, a totality of the potentials of that element or compound.

The difference between a standing electromagnetic wave and a standing scalar wave is the addition of one dimension. Both are apparently stationary. The electromagnetic standing wave forms over an antenna tuned to just below the frequency of the wave to be measured, or 'received', as the jargon has it. The difference in length between antenna and wavelength is to accommodate changes in frequency that must occur, according to the Wolff theory.

In the case of the scalar standing wave, it should be possible to build a resonating chamber that consists of a long tube tuned to the correct wavelength for that element or compound. A resonating cavity thus created will absorb the space resonance of the out-wave. NES Health has, in fact, conducted this research over many years and has found that, indeed, structured mag- netic spikes appear in the sealed tube representing the scalar wave measurement device. They are positive- and negative-going spikes arranged into wave-like structures.

The scalar wave system works, of course, by frequency modulation, and this can be detected, with specialised equipment, in the 1,000-plus megahertz range. My experiment was conducted between 1997 and 1998 based on the theory that although we might not be able to detect the waves directly (because heterodyning occurs), it might be possible to pick up spurious frequencies or even interference patterns. We did pick up such patterns, in the spikes I just mentioned.

NES Health has investigated the variations in the conductivity of space that occur in the presence of space resonance effects as mentioned by Wolff. These alterations in space conduc- tivity have been used as a way of space resonance matching phase effects found when interac- tions occur between various cells, tissues, organ structures, chemical compounds and elements. This has been a slow

trial-and-error process that has taken many decades. I was not always sure what I was measuring, but it appears that, enlightened now by the Wolff electron model, I proceeded for years with a complex system of phase space resonance matching. When a match happens, it causes a sudden change in the conductivity of space in the vicinity of the experiment. That is how measurement takes place.

So, What is Light?

Particles do have some sort of existence, as all appearances do, but they are not the prime movers, they are appearances created as interference patterns by the in-wave and out-wave of the electron. But what of the photon? For more than 100 years scientists have puzzled over what light actually is. Now it appears that it is an interference pattern coming from the electron and that looks like a quantum of energy. No wonder energy appears to be transferred from electron to photon!

In the late 1980s, an experiment designed by three Indian scientists, Home, Ghose and Agarwal, was carried out by Hamamatsu Photonics in Japan. It was conducted to see whether, when placed in certain sets of prisms separated by a minute gap, photons would be reflected, as only waves can, or if they could tunnel, as only particles can. The experiment was very clever in its concept and brought forth the conclusion that matter behaves like waves and particles at the same time. This result suggests that the duality of matter is an illusion and the Wolff type of arrangement of matter can explain a great deal about the wave-particle controversy.[24]

What is of most interest in biology, when we are considering the Wolff idea of the electron, is the concept of variations in space density. The density of space is fairly constant in all places, except for the point where the two waves of the electron converge. A non-linear condition is set up at the central point of the electron, as it is the centre of a region of changing space resonance.[25] There is some cross modulation in this region, which can be called, for the layperson, 'information interference', and this interference itself might lie at the heart of a system of energetic pathology in medicine. If this non-linearity can be corrected, then a sort of information congestion at the central point region of the electron can be corrected. We can possibly do this by correcting the density of space, something that the NES Integrator Infoceuticals may be able to do, for they include constants related to a major part of the electromagnetic frequency range. Simply put, the NES range of Integrator Infoceuticals is designed to correct information transfer in the human body-field.

One additional point is that all sub-atomic particles are categorised according to their spin (which has always been measured on the basis of high-energy accelerators). As a result of spin measurements, we have two classes of particles: fermions and bosons. It

24 John Gribbin, Q Is for Quantum, Touchstone, New York, 2000, pp.525-6. Also see 'Deepening the Quantum Mysteries', http://www.lifesci.sussex.ac.uk/home/John_Gribbin/quantum.htm.

25 Milo Wolff. Exploring the Physics of the Unknown Universe: An adventurer's guide. Technotran, Manhattan Beach CA, 1990; 1994 edition, p.189

is clear that we cannot include both spin and phase in the mathematics for the Wolff model of the electron. However, there seems little reason why what appears to be spin cannot also be explained as phase error related to frequency.

A Revolution in Medicine

One thing that is possible with the Wolff theory and is quite unsatisfactory with older models, is to have a full-wave almost lossless system of energy that self-unites and, in doing so, self-simplifies. One would expect to find photons in the cells of every living thing and not to be worried about whether or not they were able to do things such as penetrate this or that layer of tissue, since it is the electrons that are pulsating centres of dynamic action that radiate spherical waves for at least one metre. These waves look like layers of an onion, ones that create interference patterns in space that look like particles.[26] Wolff, as an astrophysicist, thinks in larger terms than the biologist!

Naturally we want to know the limitations of the energy system. Gone are the electrons buzzing about. We now have stationary standing waves sending out exploratory spherical wave messages, and the question remains as to how far these messages go. Wolff says the size of his double spheres is infinity. But amplitude decreases with distance.

The generation of a human body-field no longer requires complex wiring if the body-field can be generated by matter itself and amplified by nothing more than a cavity that behaves like an area of space tuned to a certain frequency range. The quality of the space will be affected by its regularity. The closer each organ conforms to a geometric pattern, the stronger the effect.

The ability of the waveforms to unite and recombine in space means that there is such a thing as a wave that represents the entire function of the organism - the full body wave. This is the entity we are trying to correct when we treat someone therapeutically. Affect one part of the body-field and you affect the whole, and so the theory itself indicates the likelihood of some interesting rearrangements of body functions before the correction is stable.

26 See Gabriel LaFrenière's 'The Electron Phase Shift', http://www.glafreniere.com/sa_phaseshift.htm

How Can a Computer Know Things?

Most biotechnologies use computers as assessment devices. NES Health does so as well. This begs the question how computers can interface with energy. Computers don't know anything, of course, but if you think in a new way, you will understand how they can appear to do so.

Think about the photon - the interference pattern created by high-frequency electrons - and how, when these patterns are propagated in space, objects become visible to our eyes as the patterns are reflected. The photons are part of a high-energy out-wave, exploring the universe. Then the eye picks up an in-wave and interprets that to mean that there is an object there in space. In the case of hearing, because of the in-wave and the out-wave, the sound, when it is heard, actually seems to be outside the body, instead of where we must expect it - inside the ear!

The NES device uses the same kind of process in relation to the human body-field. An out-wave is produced by a generator in the software and then the corresponding in-wave that returns instantly to the computer is matched to already existing data in the software. Many out-waves and in-waves are needed, of course, to read the full body-field, so the software does a number of scans (or tests) of aspects of the body-field in a single assessment. The body-field itself is disturbed by the scanning process, so an assessment cannot be reliably repeated until this disturbance settles. This phenomenon is very clear.

The whole activity of out-wave and in-wave of the electron involves the most minute of phase and frequency changes, which will affect how the space resonance matching occurs in the computer. The NES device is designed so that the body wave being tested is close physically to the computer itself. While the infinite stretch of the out-wave suggested by Wolff is correct theoretically, in practical applications, the shorter the distance, the less the likelihood of interference.

Things Are Real or They Ain't There

In Wolff's theory there are no different orders of reality, just change of phase. There is no 'real' and there is no so-called 'virtual', so there is no need for them to communicate with each other in some way. This is because de Broglie matter waves turn into the in-waves and out-waves of Wolff and the ultra high-frequency electromagnetic waves propagated through space. These are of such a frequency as to be undetectable by any method yet known. The entire system is real

and does not rely on holographic tricks for its construction. The universe is real, not illusory, and there is no need to invent any new type of life energy, or qi, or even a zero-point field energy. Surely zero-point field energy is just another name for the matrix of energy produced by matter waves. In fact it may well be the activity of the proton that sets up this zero-point energy field.

A magnificent quantum field stretching through the universe is made by protons in the matter within it, and there is no place in the universe that does not have matter waves in it, which means that everything in the universe is interconnected. We do not need to resort to ten-dimensional universes and the mathematics of string theory to describe the universe at all.

The most puzzling thing about the universe is that its communication is, potentially at least, instantaneous, allowing for all manner of odd events related to information transfer at a distance. The Wolff theory gives us a clue about time, as it appears that time can affect the in-wave and out-wave, and that they can reverse. More about that later. The main point here is that there are no weak and ephemeral subtle energies in the universe that just didn't quite make it into reality. There is one reality, and it is unified, not separated into categories.

This brings us to the next point: how the information network in the universe works. Its centre is the dense space in the electron. The surrounding field of in-waves and out-waves is filled up by many 3D interference patterns set up by the proximity of different electrons, and if you get many of the same atoms, you get an interference pattern in space. It naturally follows that certain atoms are much better carriers of information than others, and we can see this mirrored in biochemistry and biology generally. Biology favours 15 or so of the elements in the first part of the periodic table and has almost nothing to

do functionally with the heavier elements. Oh, except zinc.

So, hydrogen, carbon, oxygen, molybdenum, boron, calcium, nitrogen and so on, elements that appear fairly early in the periodic table, have a lot to do with biological activity in the soil and in agriculture, as well as in the human body. In all, as already mentioned, 15 or so out of the 100 elements that are of greatest importance in biological systems.

Carbon, of course, is one of the most important and has four electrons. Will it have four times the information-carrying capability of hydrogen, with its one electron? Is C-O-H, so readily found everywhere in the key molecules of biology, really there because of its huge information-carrying capability? Certainly it appears, from my few experiments in the area, that filtered water does not carry a huge amount of information compared to an ionised solution of minerals, including some of the heavier ones. Of course the homoeopaths settled on milk sugars and alcohols as the best method of carrying information about the characteristics in the quantum field of certain herbs and minerals. They had plenty of time to work out what worked best, as homoeopathy is 100 years older than allopathic medicine.

Yet it does not end there. In your head there is, of course, the picture of the spherical electron structure, with a neutron or a proton linked with it by an energetic bond in space, holding it in a certain configuration. It is fairly complex by the time you get to imagining what carbon must look like.

If you move a little further along, you will realise that it is possible for calcium to be a semi-conductor in space, allowing information transfer only in a certain direction. Electrical semi-conductors do this same task in two directions, but in the quantum field calcium is able to control the flow of information in no fewer than the six directions - north, south, east, west, up and down. This is why calcium is so important: it can block the field in certain directions, so is a key to the control mechanisms of the body-field. When it is dysfunctional, which it is in diseases like cancer and arthritis, and probably in all diseases to some extent, there are tens of thousands of chemical reactions that also become faulty.

When calcium is linked with one of the other minerals that the body likes, it forms a compound that, unlike pure calcium, which does not occur in nature, makes a very, very long wavelength, several kilometres in the quantum field. I found this out from an Australian radionics farmer, John Pannan, who was using different compounds of calcium commercially to correct the way in which the soil functioned. I did some testing and discovered that calcium compounds made a field at a frequency below that of Energetic Integrator 1, that is, below 10 Hertz in frequency.

Another thing to remember is that Wolff's theory means that it is not only electrons that make a field in space with their in-waves and out-waves, but also the components of the nuclei of atoms. Because of this, Wolff can explain the weak force and the strong force, which are so important to atomic theory.[27]

I shall tell you a little about the discovery, in the early 1990s, of calcium's activity as a semi-conductor and how the experiment was carried out, since it is very interesting. A field, according to quantum mechanics, is always there, but it is easier to test when it is energised by a small amount of electromagnetic energy. This is why even a minute electrical charge is so important in biology: the quantum field has to be activated to the right level of dynamism. So, in the experiment, two metallic blocks were set up with a low-level voltage between them. A display device was needed, since we needed to know when the conductivity of space changed, when the information transfer took place and the apparent frequency at which change occurred in large groups of identical molecules. This display device was none other than one of the many electrodermal testing devices that have been used for half a century. The machine had an indicator gauge that showed any change in skin conductivity at an acupuncture point of the person being tested. We retooled the apparatus to test for changes of conductivity between ampoules imprinted with information. We set up an electrostatic field, placed identical ampoules on the two metal blocks and then tested for a 'match', which would be indicated by a certain change in conductivity, as shown by movement of the indicator from its baseline (40 milliamps).

An ampoule of calcium was placed in the field between the two blocks of metal. This was pure calcium, not the carbonate laced with iodine or cobalt. To be precise, it was actually a glass ampoule containing 50% water and 50% ethanol, imprinted with the information message that calcium puts out into the quantum field. (We knew how to do this because of an English researcher who recorded over his long lifetime some of the

27 Wolff, op. cit., pp.196-7

energetic data related to all the elements, but we could have used pure calcium too.)

Over a series of tests, the ampoule was placed in each of the six directions in the field and we noted if the conductivity dropped, indicating that the quantum field had been interrupted. The conductivity meter dropped to 15 milliamps when the field was interrupted by calcium. (It is important to note that quantum field switching is either 'on' or 'off'. There is no 'maybe'.) Every time the field was interrupted, we had to set it up again by removing the calcium ampoule and establishing that the conductivity reading had returned to 40 milliamps.

Of course the experiment was repeated using an ampoule without the calcium information imprinted in it. It was also repeated on different days over a period of time. The results were always the same - only the calcium ampoule interrupted the field. So, even though there is an element of subjectivity in this kind of testing, the balance of probability is that there is something in the results that is important theoretically and is worthy of further exploration.

A Word about Action at a Distance

Even though recent experiments appear to have validated the reality of action at a distance (non-locality), this phenomenon has remained a hotly debated theoretical question in physics because until now there has been no known mechanism to explain it.

If the amplitudes of the in-waves and out-waves reduce over distance, then non-locality is not really valid as a concept; however, if the amplitudes are not reduced over distance, then non-locality might be correct.

The jury is still out on the Wolff interpretation. Regardless of who 'wins' the debate, it is important to note that the NES assessment device is designed to be used with the client present. As I mentioned earlier, the closer the client's field is to the field set up by the computer, the less interference there is, which means the assessment can be more accurate. Because of this, in practice NES Health does not endorse testing at a distance.

Nature is a Pattern-Making System

Wolff does not mention, so far as I know, that the conductivity of the immediately surrounding space changes when there is a match between two test items, but this phenomenon, whatever its explanation, has been the basis of natural medicine treatments for decades in Europe and North America. For 60 years it has been accepted as if it were an electrical effect. The fact is it is not an electrical effect, and this can be verified by anyone who has one of the electrodermal machines, since they will not work in the dark. Apparently the photon has a role in facilitating the effect by transferring energy to the electron, thereby activating the quantum field. They will also not work when there is no reflective surface above the machine, like a ceiling (which will reflect the quantum field back to the tester, so forming standing waves), or on the approach of a storm, because the ionisation of the air upsets the quantum field to the point that it cuts it off entirely for some hours.

There are also effects related to what happens when we get a huge number of atoms together in, say, a biological molecule that might have a large atomic weight. We get even larger numbers, to the order of billions and trillions, of atoms when these molecules group to form cells and tissues. However, nature cannot go on indefinitely getting more and more complex and having to deal with ever greater complexities of information. It solves the complexity problem through a process of self-simplification, where higher levels of order emerge from lower levels of complexity. The order becomes evident when we get to the huge numbers of atoms in cells and organs, as we then have the emergence of information fields.

Information fields may be a new concept for many scientists. An information field emerges when information feeds back onto itself, in feedback loops, and so makes what may be called 'patterns' in space. Nature recognises patterns of information, rather than individual information items. This is how nature simplifies messages: by forming units from these patterns. This is how your brain works too. Try it.

The Quantum Hologram Theory

If you can accept that organisation in space goes beyond the atomic and molecular levels - something that appears to happen - then you end up in a strange place. If you accept that energy transfer in the universe is accompanied by information transfer, you end up in a strange place again, where there really is action at a distance and it is a complex phenomenon.

After experiencing a minor satori in space, the former astronaut Dr Edgar Mitchell founded the Institute of Noetic Sciences and joined scientists from around the world in a quest for more knowledge about information transfer at a distance. Being a hugely talented scientist, he luckily bypassed the more outlandish ideas in this area of enquiry and sought to look carefully at what experimentation has been done related to non-local consciousness. He has been, however, rather partial to the idea of memory stored in water, something investigated by the late Dr Jacques Benveniste of France amidst a furore that was reminiscent of the best of medieval witch-hunts![28] The 'basic' science of Feynman, Wheeler, Cramer and Wolff is mostly left out of such discus- sions, as no one knows how these ideas apply to real life in the biology laboratory. But if you get to traditional immunology and the deficiencies of that theory, well, then there are fireworks! So, while Dr Mitchell is very keen on Benveniste, Alexander Gurwitsch's theory of morphogenetic fields, evolutionary cosmology and massive information streams that must be available to us all, this information is for more conscious people and certainly not for those in rigid systems of thought.

Dr Mitchell is very clear about the landscape for information transfer and his theory has major similarities in certain respects with the physics theory of Milo Wolff that I have already discussed. You can find out more about Mitchell's ideas by reading his papers and those by his collaborators, Dr Peter Marcer and Dr Walter Schempp.[29] Walter Schempp, of Germany, has found that there are coherent emissions from matter that carry information. Information needs coherence and structure to be able to be transferred without polluting the information stream.30 This man is of huge interest since he works with fMRI (functional magnetic resonance imaging), a technology that was developed by doubters of the chemical medical model.

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28 For a secondary source overview of Benveniste's work, see Lynne McTaggart's The Field: The quest for the secret force of the universe, HarperCollins, New York, 2003, pp.64-9.

29 Peter J. Marcer and Walter Schempp. 'Quantum Holography: The Paradigm of Quantum Entanglement.' American Institute of Physics Conference Proceedings 1999, 718.

30 Probalistic and Stotchastic Methods in Analysis with Application, J S Byrnes, J L Byrnes, K A Hargreaves & K Berry, Kluwer Acedemic Publishers, Netherlands, 1992.

Below is a summary of the properties of Mitchell's Quantum Hologram theory:

- The hologram carries information about both the present and the past.
- The hologram is non-local, so information can be transferred at a distance.
- Information transfer is apparently instantaneous (as is suggested by the Wolff model).
- The entire hologram can be reconstructed from a piece of the hologram.
- The whole is recovered via space resonance.[31]

Of interest to this model, especially the first bullet point above, is the aspect of Wolff's theory that argues that there is indeed an arrow of time, so time symmetry is lost.[32]

If you would like more information about this holographic theory and you like to Google, you can search out Elizabeth Rauscher-Bise, PhD, who is an expert on this theory.

The Quantum Hologram and Perception

In physics, we have become used to theories that are unusual. But much of Western perceptual theory collapses neatly in a heap when you apply the ideas of Wolff and Mitchell to what is taught about perception. There is hearing, sight, taste, touch and smell, and they all have a common function: they are somehow supposed to process incoming signals via the brain. There is a whole set of nerves for receiving that information and then another set of nerves for motor signals which, of course, are outgoing signals. These are the afferent and efferent nerves.

But wait a minute! According to Wolff's quantum mechanics theory, there is an out-wave and an in-wave that bring a message to the brain about a local or distant holographic arrangement. The question is, does the brain create a resonator that has a phase gate to send as well as to receive signals about what lies outside the body? Mitchell says it does. This idea, if true, essentially turns modern psychology, not to mention physiology and neurology, on its head. It means that the ears must be sending out a signal in order to hear, the eyes must radiate a signal in order to see, and so on. (Cramer's Transactional Interpretation of quantum mechanics suggests essentially the same thing.)

In the Mitchell quantum hologram model, we can at least start to understand why the body perceives the information about the world as outside itself, rather than inside the head. So perhaps biologists should be looking up from their anatomy books and going out to look for small resonance spaces - cavities - within the eyes and ears! What about odd bits of perceptual organs that have great names but whose functions are not mentioned in the books? In the ears, for instance, there is the Organ of Corti. What does it do?

Mitchell talks of a reference signal that is needed to reconstruct a three-dimensional quantum hologram and of course NES Health is looking for these in the body-field. Light and magnetism are good candidates. Wolff contends that the actual quantum field signals are too high in frequency to detect, so it is important to remember that there are resonances at a much lower frequency that, like harmonics in music, will spread over the acoustic as well as radio spectrum. I cannot help but remember a scientist, O. E. Wagner, who spent his entire career studying long waves, which he called W-waves. He

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31 www.nidsi.org/articles/mitchell_hologram.php Nature's Mind: The Quantum Hologram, Edgar Mitchell, Sc D, Institute of Noetic Science. USA, 2001. http://www.edmitchellapollo14.com/naturearticle.htm

32 Wolff, op. cit, pp. 187-8. Milo Wolff. Exploring the Physics of the Unknown Universe: An adventurer's guide. Technotran, Manhattan Beach, CA, 1990; 1994 edition, p.189

spoke of all-pervading low-frequency waves that played an important role in communications.[33]

Leaving Modern Physics Behind, We Get into Quantum Field Bioenergetics

We are now about to make a conceptual leap that is vital to our understanding of non-biochemical medicine.

We learned in 1926 that electrons consist of an out-wave. Later on, after 1986, Wolff said that the three major particles all sent out out-waves, by means of which he explained the atomic forces called the weak and strong forces. Now, in 2006, Mitchell is saying that the shape of the structure is also sending out a characteristic quantum holographic signal. What we are left with is the theory that there are such things as quantum field effects at the macro level as well as at the micro level. As Mitchell has indicated, this theory represents a major departure from the physics of the last 75 years. While this revolutionary idea is not compatible with the Copen- hagen Doctrine, it goes well with John Cramer's extended transactional interpretation of physics and Milo Wolff's space resonance theory.

Now, at last, you will be able to understand the Drivers in the NES system. Think cavities in physics! Cavities collect or appear to amplify energy. The organs of the body are cavities, and they all seem to have a field effect, which they generate themselves. In a time lost to us, the writer of the great treatise on Chinese medicine, the physician of the Yellow Emperor, said just that and called the organs 'orbs', which is an archaic word for a sphere. These spheres are what the Yellow Emperor's physician thought generated the energy for the meridian, or energy pathway, belonging to that organ, an energy pathway that wandered over the connective tissues and the skin.

Furthermore, we not only have spherical arrangements of tissues in the body, but also micro-tubules - tiny cavities - all over the body. These are found in the cytoplasm of every cell. They are wrapped around the nerves in sets of 13 and are found in abundance in the brain. There are myriads of microtubules in the kidneys, and the intestines look like a big tubule wound up.

As a teenager, I read books for amateur radio techs about antenna theory, as radio was the big thing back in the 1950s. The 'Q', or quality factor, of an antenna (which is called a dipole by radio techs and is in fact a lot like our biological tubules but a lot

33 See Bevan Reid, 'Aspects of intangible energy functions in biosystems', Frontier Perspectives 5, no.1 (1996), 41-7.

bigger) depends on the diameter of the tube. 'Quality' refers to the steepness of the sides of the resonance graph for the frequency of that tubule or antenna, so the efficiency of the tube, in its job as a resonance matcher for quantum holographic information, is related to its diameter as opposed to its length. Every tube will attract a standing wave, but to make it more efficient, we also need a reflector so that there will be two stationary waves present in order to make our standing wave. In biology, we have the cell membrane as the reflective surface.

In the case of the nervous system, for example, Western biochemical medicine is an abject failure at explaining how it works, how to diagnose problems affecting it and how to resolve them. So naturally I was interested in a new quantum field theory about it. We note, however, that the coating of the axon does not allow the passage of a quantum field, so it works like an insulator for whatever is going on inside the nerve sheath. The nerve sheath, then, protects the quantum field information inside. What does that mean? It suggests that nerves do not send electric impulses, but instead transmit quantum holograms! In the experiments I have done, the inside of the axon is able to match with photons, which may act as energisers in some respects for the nervous system, which, after all, changes its characteristics after dark.[34] As far as the quantum field goes, the nervous system does not have to be continuous, and of course it is so remarkably fractionised that it is amazing that it works at all. But there are several factors that enhance the quantum field to make the nervous system more sensitive:

- an ambient static-electric field, negative in polarity
- photons generated by the cells inside the body, not from the sun
- an electrical charge applied to a tubule itself, generated by the electrochemistry of the nerve cells and synapses
- low-frequency sound waves generated by the brain (possible references for the sound holograms)
- Source energy collected by brain cavities

Source Energy and the Zero-Point Field

It is best to go back to the source of things, and that was how, looking back, I came across my very own style of research into Source energy. Perhaps this energy is the zero-point energy spoken of by others.[35]

For 13 years I taught Chinese medicine, in which there are several types of Source energy, or yuan qi, which I took to mean the same type of energy that was mentioned by other cultures by other names, such as prana or ki. According to Chinese medicine, this energy is supposed to collect somehow in the kidneys (full of tubules) and the brain (full of tubules), as well as in the lungs (full of tubules). In 2003, while still living in a tin shed in the backwoods of tropical Australia, I took the Integrator Infoceuticals I had made for lungs and kidneys and mixed them together, making what I called the Source Driver Infoceutical.[36] This Infoceutical was something that would tell me what the body-field Integrators, when combined, would match with in the universe. (To refresh your memory, the NES Energetic Integrators are the information routes in the body-field, what I used to call 'compartments' in my early research.) I already knew that every Integrator matched with a number of the elements useful for biology, but the zero-point field was supposed to be a general field that, while measured in a vacuum, was actually everywhere all the time. My reasoning was that the lengths and diameters of the tubules in the body would be sensitive to this zero-point field if it was the source of an energy whose purpose was to make the body work via its body-field.

I then did some space resonance matching experiments to see what the Source Driver really did with the matter waves produced by various elements of the periodic table. And bear in mind that even when there are compounds in matter, in the quantum field they seem to me to behave like their individual constituent elements. The Source Driver, if it truly was linking with the zero-point field, should have had a very big range of matches with the elements. In theory, all matter should match the zero-point field. But, as my experiments showed, it didn't. Only the following elements matched the zero-point field:

34 According to experiments carried out in Cooran, Queensland, Australia, in 2001.

35 See McTaggard, op. cit., pp. 19-36. Lynne McTaggart's The Field: The quest for the secret force of the universe, HarperCollins, New York, 2003, pp.64-9.

36 Ibid.

hydrogen	boron	carbon
nitrogen	oxygen	aluminum
silicon	phosphorus	potassium
calcium	manganese	scandium
vanadium	chromium	manganese
cobalt	ruthenium	rhodium

cadmium

Perhaps you understand the Source Driver better now. It reminds the lungs and kidneys how to collect matter waves from the above elements! That is the theory.

If we really want more Source energy, we can get it from breathing (something sick people don't like to do) and not necessarily from taking an element in a supplement. Perhaps sea air is good for us, with all the traces of minerals in it from the spray. However, all we can deduce from this basic experiment is that some parts of the zero-point field are what the human body wants and some are not.

As you can see, once you have stepped outside the embattled spaceship Anachronism of the medical theory based on chemistry, the terrain is exhilarating. And I am reminded immediately of a quote from the Yellow Emperor's physician, who said, 'In healing, it is necessary to go beyond the ordinary limits.'

More about the Links to Electrodermal Testing

There is a long tradition in Europe and America of electrodermal testing, with Dr Voll and the Dermatron, Dr Schimmel and the Vegatest and many other derivatives of these systems. The tradition goes back now 60 years or more, and efforts have been made over this time to increase the accuracy of the measurement system and make it more like a medical investigation tool.

The heart of the electrodermal systems is always a physical phenomenon called the indicator drop, where there is supposed to be a change in the conductivity of the subject's skin resistance when there is something that matches their body-field. This effect has been observed by thousands of practitioners for 40 years or more and is very familiar to us.

This indicator drop is known to vary according to the electrostatic charge in the air. It is also known to be subject to random errors when the testing becomes too complex; hence the laborious system of individual point testing developed by Dr Voll. However, in my research, I found that this indicator drop, or change in apparent conductivity of the body-field, is dependent upon many other factors that were not previously recognised, including the amount of ambient light and the availability of a reflective surface above the test area. So I was forced by the evidence to call the electrical nature of the device, or the apparent event, into question.

In 2006, I realised that the entire body hologram could change its reactance - the resistance of space, if you like - to a complex waveform, and that this change could occur in either direction, negative or positive. Positive and negative reactance values are studied in physics and are a legitimate measurement. Their parameters have also been studied. In simple language for the non-scientist: there is positive resistance and negative resistance. The word 'superconductivity'- which is the vanishing of all electrical resistance - has been used relentlessly in relation to biophysics. But since it is something that does not occur at room temperatures and pressures, it is not a concept that can easily be used in relation to electrodermal measurement in biology, or in quantum biology.

Again in non-scientific terms, a slight amount of negative resistance in the circuit created by the electrodermal test means an apparent change in

the reactance of space! We need to invoke Milo Wolff and his oscillating electron system, since only then will the so-called negative resistance effect occur. The Wolff ideas can provide us with a newer, more scientific view of what happens when electrodermal testing is done with the human-body hologram as a witness.

Last Thoughts about the Relevance of the Wolff Theory to Medicine

It can be difficult to envisage the way in which biochemistry actually works, so it is worth us revisiting two of our original questions:

- How can the electrons and other particles of an atom 'know' about the presence of another molecule?
- How can there be a selective process of interaction related to the distance between molecules that can explain heat ambience, light ambience and other factors like pH, electrical ambience, pressure and so forth? Biochemistry can be affected by all of these factors and more, so our model will need to be able to explain all of them to be of any real value to us.

Remember that most of the last 100 years of quantum physics have been about trying to explain measurements and the interactions of sub-atomic particles under high-energy conditions, where atoms or particles are bombarded with other particles in an accelerator. These conditions do not apply in the world of biology, so of course these cannot be our methods of enquiry.

So let us further define our challenge. We are looking for explanations of why physiology fails in a very specific context, trying to get a theory of pathology to actually work on the human body and seeking a theory that is acceptable to all in the field. We must work with room temperatures and pressures, as well as with very low charges in the field so far as electrostatic energy is concerned. The voltages that appear in the body may not be very high, but they are critical to the function of many aspects of physiology, not the least being the nervous system itself.

The other parameters we have to consider are those of low-level electromagnetic fields and magneto-gravitational fields, such as those produced by Earth's magnetic core. If gravity is considered to be inherent in mass or perhaps even in space, then in the Wolff model, gravity plays a part in the function of every electron.

Time is another concept that we need to incorporate into our model, even though this is

perhaps not a feature of quantum dynamics. Time, according to Wolff, will be found not in the determinism of the Swiss watchmaker, but in a flexible arrangement in the field of the in-waves and out-waves of the three particles (electron, proton and neutron). Time is necessary in physiology to explain the speed of chemical and other reactions and how variable they can be.

So far in the NES research into the QED field, our attempts have always been to explain pathology as something going wrong at every frequency level between 1 Hertz and 1016 Hertz. This approach is alright so far as it goes, but it does not account for the intricacies of the Wolff model. The essence of our problem is to adequately describe the ways in which a spherical scalar wave can change. So we can make no attempt at describing pathology until we know what the structure of the electron really is. And no core structure for the electron or even the photon will be found in the physics textbooks, although it is conceded that such structure is a possibility.

Milo Wolff has gone so far as to give a mathematics-based view of what the electron's structure may be. In his model, there is an out-wave, which he says corresponds with the de Broglie matter wave. This out-wave is an exploratory wave that 'finds' other particles, as a prelude to some interaction being possible when there is an environment of correct temperature, pressure, pH and electrical charge. Wolff also suggests, from pure logic, that there must be a return wave, which he calls the in-wave, which 'reports' on what sort of particle is out there in space. This in-wave has never been measured, so far as I know, so it remains firmly entrenched as a theoretical concept only.

Wolff further suggests that the in-wave and out-wave have a phase relationship that can be measured at the point in space where the electron 'is', if we may use that most inaccurate of English words. In addition, interference patterns are created the moment an electron, or a group of two or more electrons, is located in space. So immediately we are confronted with the need to have boundaries in space, and this is accomplished by the structures created by matter itself.

Wolff uses the term 'phase', which is correct if these interactions are space or position related, although it appears that time cannot be a constant as it is in Newtonian universes. This phase is not related to time as it is in the field of electronics, but rather as time is related to place, or position, in space. When waves do not quite match up, then we have a phase difference. Wolff suggests that phase errors can go from ± 0° to 180° in his system before the parameters of his model change. In cancer, I have measured errors of 340°.

Phase looks as though it is the source of information in space, and it is permanently there in space, just as the particle itself is. This means that space may have memory, which is of particular interest to many researchers in parapsychology and other fields. The changes in phase that occur are about the time-based interactions of particles and their patterns in space before they react. The connection is obvious to the concept of a dynamic body-field. This body-field is such that it changes every second and so will be measured differently in every instant of time.

But what else is going on? Once there is an energy exchange between electrons or other real particles, then there is also a corresponding change in frequencies of these particles, and there is the real energy exchange required by and described by biochemistry. Of course, there also is a static system of the body-field that relies on its energy state, and this is able to be changed as well, but is less reactive. We have to have a solid body state, as we are not will-of-the-wisp creatures at all!

The energy state of the biological hologram can be described in terms of Milo Wolff's model, so let's examine that process.

The electron has two centres of space resonance, and these will normally converge, so as to make the lowest energy state possible for that electron in that place and time. Particles will always return to their lowest energy state. The in-waves and out-waves will also return to their lowest possible amplitudes. These are rules of the system.

However, if the electron is energised by being in another field, electric or magnetic, or even gravitational, then these centres in the electron may move apart, creating a way of expressing a higher energy state. At a certain point, this energy shift can cause an electron to emit a photon, although Wolff sees this as the creation of an interference pattern. It follows, then, that the entire particle zoo may be appearances created from the varying types of electron interference patterns. Whether or not these interference patterns can be regarded as possible sources of information storage is an open question

to date. The really important sets of information may be stored as phase in the innermost part of each electron's dual centres.

If each change in the phase is progressive and can be related to a specific frequency resonance, then the phase shift can result in a transference of an electron to another, higher or lower, frequency state. Change in phase to the power of specific resonance equals the change in distance between the electron centres. There has to be a mathematical relationship between phase and energy state, and Wolff has expressed it.

It is of interest that we have found in NES research that emotions can affect phase by variable amounts, which can be recorded in degrees. Emotions have been measured at between 16 and 45 degrees of shift from left to right of a position in the human heart. So we have a model that allows emotions to be built up, as well as expressed as heat when they are discharged or when the emotional holograph in space breaks down. You cannot go on adding energy to a system forever without it having to discharge itself, and this certainly occurs in the case of emotions. And when they don't discharge, pathology results from the ensuing higher energy states.

We have found that most foods do not affect phase at all, according to the way we have measured them. But things such as the NES Energetic Terrains can have a huge effect on the phase and, therefore, on the energy state of the body-field. Energetic Terrains can be cleared by moving them from their chronic to acute stages, and this is the process we are able to observe during a client's use of the NES Infoceuticals. Homoeopaths may not have been right about everything, but their understanding of the way we move from chronic to acute stages of illness is certainly worth keeping in a science-based system of medicine.

These ideas are in their infancy, of course, but you must already be able to see their potential for creating an entirely new world of biology, and even of medicine.