ANOTHER PHYSICS REVOLUTION

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" Without deviance, no change is possible"
— Frank Zappa, American Musician and "Philosopher"

MAX PLANCK

In 1900, a physics revolution was initiated in part by Max Planck, who had made a momentous observation concerning the behaviour of radiation from a black metal box. The radiation could not be explained by the prevailing ideas of how radiation of electromagnetic waves function, something owed to Maxwell, who fifty years or so before had described electromagnetic wave propagation with a series of four equations.

Planck observed that the energy radiated from a 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 that differed from the predicted behaviour of the Maxwellian equations. It is in fact not a very large number, but because its influence grows as does frequency, 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 need for correction of a simple energy formula. It led to no end of trouble.

ALBERT EINSTEIN

Already by 1905, the unknown clerk in the Berne patents office had used Planck's new arrangement of energy to explain the photo-electric effect, a very puzzling phenomenon which can best be explained by saying that metal surfaces can radiate light when irradiated by electrons. This does not seem to be a problem now, particularly if you don't think about it much, since even until recently no one could understand how a photon can be ejected by an electron, or how an electron can absorb a photon.

The problem of emission and reabsorbtion which occurs in atoms remained a problem; however, it is one that was not addressed properly until the last 25 years. Most of the time, 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 already 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 begin to turn every time the apparatus is placed in strong light. Of course the light packets are hitting the blades, where they are bright, and being absorbed on the black side, so making the windmill go around….or so 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 what this chapter 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 quantum particle theory. He admitted that he did not know why light appears to behave like discrete particles. The photon was never named by him and 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 a photon is.

But unfortunately for us all, the duality of modern particle physics had begun in earnest and was to last 100 years. 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. Both could not be entirely right, yet matter appeared to act like both in different circumstances.

Einstein was there just when the idea of how the atom was arranged was still open to deep question. Provisionally, he 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, and perhaps more tragically, he never needed to! He himself realized that his quest could have been in vain.

In fact, from our vantage point, in 2005, the 100-year-old wave-particle duality idea in physics may have been nothing more than a wild goose chasse that has consumed the lives of many scientists.

In 2005, we are still beset with these four energy forces in the universe;

Electromagnetic fields

Gravitational attraction

The Weak force

The Strong force

Why do we have them? Because Einstein thought they were needed. Some are odd, like the weak force, which only exerts a force for about 14 minutes.

But the most troublesome of these forces is gravity, which irritates physicists by acting instantaneously. Also, because no gravity particle has ever been found, many have accepted that it is somehow inherent in the mass of atoms themselves.

There are particle physics specialists everywhere, yet not one of them has ever directly seen the particles they study. One of the particles – the proton – began life simply as a space inside the atom, only to become a particle once academics got hold of it.

And the 300 to 400 "particles" now with us as a result of basic quantum particle physics research are supposed to be moved around by these four forces. These particles are supposed to have "spin", magnetic moment and other characteristics too. A field is supposed to be created when one or more of these particles move from one place to another under the influence of the forces. What creates the forces? Not known.

Unfortunately, these forces have never been united, or their origins explained, even after 100 years of the best brains on the planet working for their life times, as Einstein did himself, without a positive result. Even as a failed scientist, which he is according to his own attempts to achieve a unity in science, he managed to attract enormous prestige. He became a cult figure for the magazines and newspapers. This does nothing for his enduring scientific reputation however. We have to look at his legacy, not his haircut.

Einstein, to his great credit, never accepted the idea proposed by some quantum physicists, and a quite baffling idea at that: the apparent randomity of the behaviour of the quanta or "particles". He could never accept, perhaps rightly, that there seemed to be no underlying law relating to the behaviour of matter. His most famous quote 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. Even though we have some evidence of matter always behaving like both from a duo of Indian scientists in the 1980s, the wave-particle duality is still currently with us. But it has changed in one respect. It can now be said that matter behaves not so much like one or the other , but like both, at the same instant of time. More of this later on.

NIELS BOHR

The idea of the particle being the basis of reality, rather than the wave, began in the days of Niels Bohr, who decided that waves were somehow unreal and that somehow particles or packets of energy were more real, giving us two universes to explain instead of just one. 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 and a gaggle of other thinkers were Danish.

Direct observation of matter was not possible at that time, so observation was replaced by recourse to statistical models, and direct observations of the behaviour of matter at normal room temperatures and pressures was never considered possible. Someone even concocted an uncertainty principle (not a law because there was nothing to make a law about!) which of course discouraged scientists from attempting to set up direct measurement experiments from 1926 onwards. Low-energy particle physics was doomed from the start. There are no Low-energy Particle Physics Departments at universities.

IRWIN SCHROEDINGER

Like many nineteenth-century scientists before him, Schroedinger 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, Schroedinger has greatness, in that he not only distrusted quantum mechanics greatly, 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 has three dimensions and therefore three axes. You can see a standing scalar wave when you expose dry sand on a plate to low-frequency sound waves. The sand forms little heaps in patterns, showing the outline of sets of waves. The scalar wave, as we shall see, had more distance to travel.

LOUIS DUC DE BROGLIE

On his first entry into science, de Broglie wrote a degree paper that scored 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 were not so much particles, but waves of only certain allowable frequencies. So it has been accepted since 1929 that electrons do have specific wave as well as frequency properties. But due to the politics of Science, we do not have Departments of Wave Physics but Departments of Particle Physics dotting our country-sides.

> “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."
>
> Louis de Broglie, Nobel Prize Speech, 1929.

The Duke did not like the recourse to statistics in understanding matter, as was propagated by Bohr. He suspected, like Einstein, that statistics covered a multitude of things that might actually obscure our efforts to understand the structure of matter.

De Broglie turned out to be of greater importance than first agreed, when late in the twentieth century his work as revisited, with interesting implications, which we 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! More of that later.

De Broglie said 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, Schroedinger and Einstein were all very unhappy about the development of quantum theory from its earliest days. None of them liked the idea of a chaotic universe, where there was apparent randomity in the behaviour of what was then considered to be "particles".

Few, even today, realize that in 1954, close to Einstein's end, he was still quietly backing wave theory, showing that it never went entirely out of fashion. Here is a quote worthy of consideration;

> "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."
>
> (Milo Wolff, from www.spaceandmotion.com/physics-NielsBohr.htm)

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 can never "know" or "measure" the position and velocity of a particle at the same time. And 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 now know.

Surprisingly, the dictum of Heisenberg met with little resistance and it ended up in every text book, even though it denies the one, true hallmark of science, the insistence on 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 some insight into the quiet desperation of the quantum physicist, and little else.

So why indeed did the particle appear to win over the wave, even though de Broglie had been honoured for his stunning work on waves?

Here 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 could produce mathematics that could apparently predict the place where a "particle" might be found.

The wave theory people suffered a 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 an idea of waves and particles in a statistical matrix. Yes, he contradicted what he had said earlier in his life. But he was the first one to consider the idea of a matrix of force fields in space, and even was led to wonder what on earth space actually IS.

PAUL DIRAC

If you are looking for a sensible physicist, you need look no further. He acknowledged in 1974, that the Born statistical idea from 1928 is universally accepted, and added that

> "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."
>
> (P A M Dirac, "The Development of Quantum Mechanics", conference held on 14 April 1972, Rome)

Dirac always thought, it seems, that the electron was a wave structure without particle substances attached to it.

Well, in fact Dirac's desire, expressed thirty years ago now, was in fact realized in the last decade in several ways by several people. Now we have time to examine the solutions proposed to the impasse that quantum physics had trapped itself in from 1900 onwards, with more and more rails being constructed around the corral, with little effect when it comes to satisfying those who desire a sensible, orderly universe.

RICHARD FEYNMAN

With Einstein long dead, the endless search for a unified force field theory languished somewhat, and particle physics had become blighted by endless confusion. This can be mirrored in these quotes from Richard Feynman, who was no stranger to exasperation.

> "I think it safe to say that no-one understands quantum mechanics."
>
> "Science is the belief in the ignorance of experts."
>
> (Feynman, R. The Pleasure of Finding Things Out, 1999, pp 186-187.)

Feynman made a dent in the randomity 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 a quantum, or chunk of energy. He developed a system, described in his own books, called path integral calculation, to predict what Heisenberg said could never be known: the expected location of a quantum of energy. Yet the mathematics proved very troublesome and Feynman himself acknowledged, in 1985, that it was a cause of some distress. The solutions to his calculations, a process called renormalization, frequently ended with infinities that had to be cancelled, perhaps a sign that something was wrong.

But even greater that that, he fell upon an idea that has enabled quantum physics to move out of Dry Gulch. The idea of a real world accompanied by what Plato had long ago called "shadows of reality" outlined in "The Republic", was the dry gulch that the physicists had entered in 1900 or thereabouts. The idea of a real world with an accompanying virtual world was not intellectually pleasing in ancient Greece, and it is 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 just that—a study of the physical world; while metaphysics is concerned with the virtual world—the shadows of reality mentioned by Plato. If something is real, it can be measured, even if not always directly. We don't want two universes. We don't want different degrees of reality. But what if we could accommodate a matter structure that allows for all of the good science of the last century as well as some interesting possibilities for the next? This is what this article is about!

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. He was awarded the Nobel Prize for that in 1902. (See H A Lorentz, *Theory of the Electron*, 1909.) Feynman up-dated Lorentz's idea by simply replacing the "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 discipline was called quantum electrodynamics, and it assumed that there are "particles" being moved around by something. That was in 1945, and he developed the new QED field theory with a colleague, Wheeler. Feynman was hugely successful with his new concept and was awarded a Nobel Prize in 1965. Feynman thought there had to be an in-wave and an out-wave in the particle, or wave as he should perhaps have called it. And the spherical wave was certainly new, quite different form 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. It was also a stationary or standing wave. That is to say, its velocity as related to the observer is zero. This idea, then, was quite new. And the ideas had moved from two-dimensional waves to three-dimensional ones. But Fenyman had missed one important thing—the idea of Schroedinger concerning using the scalar wave instead of a Maxwellian wave. And in addition Feynman would not ditch the particle as a concept, although he did see the problem as perhaps a linguistic one.

But something had happened at last. Better results in practice where obtained from Feynman's concepts, and his stature grew. He was still a long way from the idea that was to emerge in the late 1980s and 1990s, an idea which curiously mirrored the view of a physicist named W Clifford, who is 1876, just after Maxwell delivered his famous four equations, said, "Matter is undulations in the fabric of space."

Why did it take so long for physics to move on in its understanding? Isn't it clearly 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 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 re-arrangement 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 (or holy cows) in science, and one of these is called cause and effect. Cause and effect are supposed to be time related, so that the cause always precedes the 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 before another in a time sequence. This is okay for you and me, because, well, we are not really institutionalised scientists as such. We know what time is. But physicists don't. No idea. You know what time is before you go to college, and when you come out, you don't. So Feynman's idea is great, but it can't account for time.

Dropping "particles" entirely was not to Feynman's taste, and it was not until experiments called "quantum super placement" were carried out, where 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 theorists. We are forced back to Schroedinger's great statement that particles are *schaumkommen*—appearances. They appear and then disappear; that is known of course to be true. It is very hard to build a universe out of things that come and go without apparent reason. Could particles simply be manifestations of energy exchanges 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. Science changes on the basis of observed events in nature. 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. He was surprised to discover 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. 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 could not. So how did the idea of using a standing scalar wave with de Broglie's mathematics of the electron fare in this respect?

Wolff had noticed that the sum of the out-wave and in-wave in Feynman's QED physics model equaled 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 its mathematics the following physics laws; Conservation of Energy, Quantum theory, Dirac's Equation, QED and Feynman diagrams, Special relativity, Electric charge and Maxwell's Equations, Newton's law F=ma.

This is what is new about the Wolff model: There are TWO points from which spherical waves are produced, and in the case of the electron these two points are in the same place. So that makes four waves possible in some cases where the points move apart, due to a simple phenomenon called heterodyning.

If every particle depends on every other created particle for its existence, then we must have a system, envisaged long ago in 1883 by Ernst Mach, that allows for intercommunication of all particles in the universe. Wolff liked this idea because his background is astrophysics. He could see the big picture. And the time problem was solved by giving all particles an oscillatory system that could keep time.

Again, it has to be said 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 THE NEW MATTER THEORY

The new model is of two spherical waves, one moving outwards infinitely, the other moving inwards towards the 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:

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

The two waves form a standing scalar wave. Spin occurs with the reversal of the in-wave, at the central point, into an out-wave. There is a 180-degree 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 can take place due to the space resonances. If one oscillator increases in frequency, the other one decreases, according to the law of conservation of energy. This is the manner in which energy exchange takes place.

Space is not just something with nothing in it. It has density, and this is set up in space because of the matter waves produced by all the matter in the universe. This is called the vacuum in physics jargon, although it is not “empty.” An electron is really just a change in the space density at the centre of a spherical wave.

By now it will be clear that a frequency shift means an energy change to a higher or lower value. This occurs when there is any interaction between particles, and this can be over a distance because the exploratory wave going out goes out infinitely.

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

The question arises, especially for commercial development companies like NES, about 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. These phase shifts have been catalogued by NES, a task which took many years, and all normal tissues and cells of the body can be assigned a phase value between zero degrees and 180 degrees. For the non-technical reader we have to say that phase is about the co-ordination between waves—how and where they fit into space. Waves are "in phase" when they fit together.

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

Likewise, it is found that the cancer is of a mass and temperature that is different from the surrounding tissues, indicating that a phase error may lay behind this and many other pathologies which 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 practice, medical practitioners have called this effect "geopathic stress". It has been found by preliminary NES research to be a key factor in pathology.

How has the Wolff model changed medicine? We are left with two worlds and both of them are real. The first world we already know a lot about: the physics laws, the five senses, laboratory instruments, and time-related events. The second world is that of the scalar wave interactions, 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 world affects what happens in the directly observed world. In the scalar-wave world, matter has a "knowledge" of the state of other pieces of matter. Without that knowledge, 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 at last a biological control system based on field interactions of the scalar wave is now possible to conceive. In therapy, we need not try to alter frequencies, since they are determined by the matter itself and where it is on the Periodic Table. But it is 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 of biology has a characteristic phase value, and these are used as identifiers in NES technology. Pathology results form the phase error being greater or lesser than normal. This may be only a matter of several minutes of a degree.

NES has since 2000 developed a group of twelve phase correctors called Energetic Integrators, each based on a range of 15 degrees of correction, which is of course cumulative. There being twelve of them, we get to 180 degrees, after which the system ends for that type of particle (the electron).

We have found experimentally that the human body particularly dislikes, or tolerates badly, a phase error of 90 degrees, and this error is responsible for many disease states hitherto not amenable to therapy of any type. This type of error is corrected by sets of NES therapeutic mixtures called Energetic Terrains and Energetic Stars, as well as by just one of the Integrators. Why does the body not like 90 degrees or, for that matter, 180 degrees? These angles represent intersections of planar waves, such that the wave can be cut off and information flow impeded.

NES MEASUREMENT OF THE QUANTUM SCALAR WAVE

If there is, in fact, as Wolff claims, a pair of standing scalar waves equal in frequency to the de Broglie wavelength for various electrons of various elements, then surely there is a way in which it can be read. It will not just represent the electron but the entire particle zoo that grazes near to 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 only one of another dimension being added. 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 length and wavelength is to accommodate changes in frequency, which must occur according to the Wolff theory.

So with the scalar standing wave, it is possible to build a resonating chamber, consisting of a long tube tuned to the correct wavelength for that element or compound. The resonating cavity thus created will absorb the space resonance of the out-wave. NES has conducted this research over many years, and has found that indeed structured magnetic 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 in the 1000 plus megahertz range with specialized equipment. The experiment was conducted between 1997 and 1998.

NES has investigated the alterations to the conductivity of space which occur in the presence of space resonance effects mentioned by Wolff. These alterations in space conductivity have been used as a way of matching phase effects found when inter-reactions occur between various cells, tissues, organ structures, and chemical compounds and elements. This has been a slow trial-and-error process taking many years, in fact many decades.

It appears that, enlightened by the Wolff electron model, we have proceeded for years by a complex system of phase matching, which, when it occurs causes a sudden change in the conductivity of space in the vicinity of the experiment.

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. For 100 years, many have puzzled about what light actually IS. Now it appears that it is an interference pattern coming from the electron that looks like a quantum of energy. No wonder energy appears to be transferred from electron to photon!

In the late 1980's, an experiment designed by three Indian scientists, (Home, Ghose and-Agarwal) was carried out by Hamamatsu Photonics in Japan. It was designed to see whether photons, when placed in certain sets of prisms separated by a minute gap, would be reflected as only waves can be, or if they would tunnel, as only particles can do. The experiment was very clever in its concept and gave the conclusion that matter behaves like waves and particles at the same instant of time. This indicates that the duality of matter is an illusion, and that the Wolff type of arrangement of matter can explain a great deal about the wave-particle controversy. (See John Gribbin, *Q is for Quantum*, 1998 ed. pp 525-6.)

Visible photons do not take part in this type of information-carrying process, which is now attributed by NES to the 180-degree phase shift function at the centre of the electron. The photon, in this context, is not needed to transfer information or, therefore, energy; and it is not critical to quantum physics at all! The machinery of energy transfer is an interaction of two oscillators, which create changes in space resonance.

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, excepting 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. (See Milo Wolff, Exploring the Physics of the Unknown Universe, p 189.) There is some cross modulation in this region, which can be called for the layman "information interference", and this 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, so long as we know how to do this. And this comes down to a correction for the density of space, something that the NES Integrators may be able to do, using constants already measured related to a major part of the electromagnetic frequency range. The NES range of Integrators is designed to correct information transfer in the human body field.

All subatomic particles are categorized according to their “spin”, so we have Fermions and Bosons. Yet it is clear that we cannot include both spin and phase in the mathematics for the Wolff model of the electron, and other particles. Spin has always been measured on the basis of high energy accelerators, and there appears to be 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 Milo Wolff theory, that is quite unsatisfactory with older models, is that is possible to have a full-wave and nearly lossless system of energy that self unites, and in doing so also self-simplifies itself. (ref: “The Electron Phase Shift” at http://www.glafreniere.com/sa_phaseshift.htm).

One would expect to find photons in the cells of every living thing, and not be worried about whether or not they were able to do things like penetrate this or that layer of tissue, since it is the electrons which are pulsating centres of dynamic action, which radiate spherical waves, it is agreed, for at least one meter . These waves look like layers of an onion, ones that create interference patterns in space that look like particles. Wolff as an astrophysicist thinks in larger terms than the biologist! But 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 now as to how far these messages might go. Wolff says the size of his double spheres is infinity.

What’s more, the generation of body-fields no longer requires “complex wiring”, as the body-field can be generated by matter itself. It can be amplified by nothing more than a cavity, which behaves like an area of space tuned to a certain frequency range. The quality factor of the space will be affected by the regularity of the space. The closer each organ conforms to a geometric pattern, the stronger the effect.

The ability of the waveforms to combine 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 do energetic medicine on someone. 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 any correction can be considered stable.

AND HOW CAN A COMPUTER KNOW THINGS?

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 the electron, 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 an 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–Professional System does just that with your human body-field; an out-wave is produced by a generator in the software and then the corresponding in-wave, which returns instantly to the computer, is matched to already existing data in the software. There are many out-waves and in-waves needed of course to do all of this, so the software, during a single test, is actually doing a number of scans of the body-field. (However, since the space between the computer and the human body-field is disturbed by the scan, a re-scan cannot be done with reliable results until this disturbance settles. For NES, we do not rescan for at least 5 days.) 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 matching occurs in the computer. The NES device is designed so that the body-field being tested is close physically to the computer itself, because the shorter the distance, the less likelihood for interference (although it is correct that the out-wave of Wolff's model is in actuality infinite).

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