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Consciousness and its materialization

Ronald Bryan
Department of Physics, Texas A&M University
College Station, Texas 77843-4242
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In June 2002 I attended a six-day session at The Monroe Institute (TMI) near Charlottesville, VA, where twenty of us participants were instructed on how to bend spoons and forks, greatly accelerate the sprouting of seeds, faintly illuminate fluorescent tubes, and in some cases, throw combinations of dice (fives and nines) at a rate far exceeding chance probability. We were trained by two instructors, and helped by the Monroe Hemi-Sync binaural audiotapes to achieve certain meditative states. I didn't succeed in bending any flatware or in accelerating any seed sprouting, but I saw sixteen others do it with great success, and it made a believer of me. (Later I was told that physicists don't think that it is possible, so are never any good at these things.)

As a physicist, I had rebelled at the thought that human intent alone could affect macroscopic matter, but as a human, I had seen it happen, so naturally I started working on a theory of how this could be. I like this one: Hundreds of people are riding on a ferry when all of a sudden a voice comes over the public-address system commanding everyone to run to one side of the boat. They all do so and the boat rolls over and sinks. Now for a crane on another boat, say, to physically roll the ferry over would call for a tremendous amount of energy. The public-address command did the trick with just a few watt-seconds of energy.

Similarly, if a person could mentally urge the 10^{25} electrons in the neck of a stainless-steel spoon to all move to one side, then the spoon would bend. This mental command would require almost no energy. Yet to bend the neck of the spoon by hand would call for a lot of energy. I know. I tried to bend back a stainless-steel spoon that a student at TMI had bent, and after exerting a considerable amount of force, still couldn't. Yet the student had bent the spoon barely touching it. Indeed, a few days later she held up a table-knife in a restaurant and with very slight pressure, caused the blade to fall over.

But how can one mentally command electrons to do anything? Well, to begin with, what the mind needs to command is not the electron as a particle, but the electron as a *waveform*. (Physicists say "wave function" rather than "waveform", but I prefer to say waveform since it exists whether or not we choose to model it with a mathematical function.) A waveform is something like a blueprint that one might use if one decides to build a house. In the case of an electron, if its waveform is traveling in space and reaches a particle-detector,

then it may choose to materialize itself as a particle following the probabilities indicated by the waveform. Exactly where a given waveform will materialize the particle is not known to scientists. Contrary to the Copenhagen School, I don't think that this is decided by the experimental observer, but rather by the electron itself. Nevertheless, perhaps the electron's waveform can be *influenced* a bit by a person's conscious intent.

Why I say this has to do with the similarity of the human consciousness and a wave function. Both can exist in two places at once, both can harbor two physically incompatible "blueprints" at the same time, and both can become entangled with another consciousness or wave function. So perhaps the human consciousness is indeed a wave function, and the electron's wave function is conscious, and the two can interact with each other. This theme is further developed in my paper [Bryan, 2002].

Item: Over some two decades, Robert Jahn, Brenda Dunne and their collaborators at the Princeton Engineering Anomalies Research (PEAR) laboratory found that 91 untrained volunteers could slightly alter the output of an electronic random number generator (RNG) [Jahn *et al.*, 1997]. The RNG consisted of a noisy diode whose output was amplified and clipped to produce a string of 1s and 0s, usually in groups of 200 digits per run, such as 1. 0, 1, 0, 0, 0, 1, 1 . . . , for a total of 200 numbers. Jahn and Dunne found that their volunteers could change about one digit in 10,000. This may not seem like a lot, but after one-third of a billion 1s and 0s streamed past the volunteers, they had changed some 30,000 digits. The likelihood that this happened by chance is only one part in 13,000. (But see a larger study involving three labs [Jahn *et al.*, 2000] where these results were not replicated. Apparently unknown factors are at work here.)

How could the volunteers have affected the RNG? Perhaps by mentally altering the flow of electrons in the device, I estimate that upwards of 10^{13} electrons were involved in producing each digit. If someone at TMI could influence 10^{25} electrons' waveforms in the neck of a spoon, then perhaps someone else at the PEAR laboratory could influence 10^{13} electrons' waveforms in a RNG.

The success of mental spoon bending and digit-changing suggests a physics experiment. Could a human, by mental intent alone, change the spinning motion of a *single* electron? The human-electron system would be far simpler to study than the human-RNG system or the human-spoon system, by some 13 or 25 orders of magnitude, respectively.

Here is how the experiment could work. An electron has an intrinsic spinning motion, and when it finds itself in a magnetic field, quantum mechanics dictates that the electron's axis of spin may point only along the magnetic field lines or opposed to them. The electron's angular momentum must be $h/4\pi$, where h is Planck's constant. In the experiment, the human would attempt to reverse the direction of the electron's spin-axis, *i. e.*,

turn counter-clockwise spin to clockwise, or *vice versa*. But how could we know if the spin of the electron had been reversed?

There is an experimental setup that can tell us: Take a magnesium atom and strip off its two valence electrons. This will leave an ion with closed electron shells like the noble gas neon, only with the net charge of $+2e$. Now add back one of the electrons. This (valence) electron will be the one that we work with. It will be trapped on the magnesium ion as a spherically symmetric waveform enclosing the neon-like core, only some three times farther out than the core. The charged ion will be confined electromagnetically in a Paul trap at extremely low atmospheric pressure in a magnetic field about 100 times stronger than Earth's. Now we shine a tunable dye laser on the ion. When the right frequency is reached, the ion will light up. It will emit 280nm ultra-violet light so bright that one could see this single ion with the naked eye were the light in the visible range! Instead we see the light with a photo multiplier tube.

How is this happening? As follows: A laser photon of wavelength λ excites the valence electron from the $3s_{1/2,1/2}$ ground-state level to the higher $3p_{3/2,3/2}$ energy level, as sketched in Fig. 1. The electron immediately drops back to the ground state (see wavy line) emitting another photon of this same wavelength λ, but in an arbitrary direction. This cycle is repeated up to $100{,}000{,}000$ times per second and is called laser-induced fluorescence (LIF). The human eye can intercept about $10{,}000$ of these emitted photons per second, so the ion would be visible were it not in the UV.

Despite the fact that the electron is going up and down so rapidly, its spin axis stays locked in the same position. This is remarkable stability for a psychokinetic experiment. More details are given in my paper [Bryan, 2002].

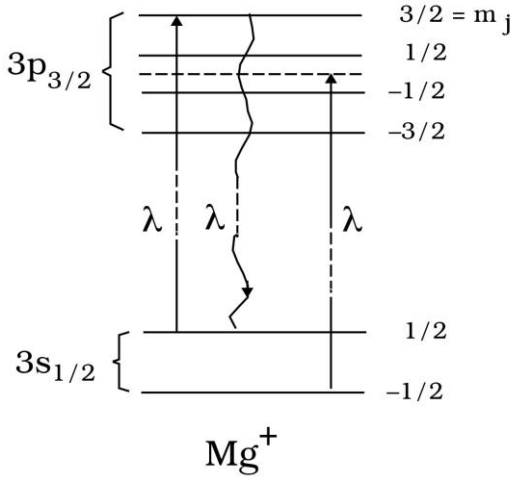

Fig. 1. Energy levels of the valence electron of Mg^+ immersed in a 50-gauss magnetic field. Laser-induced fluorescence is indicated for a laser beam of wavelength λ. The dotted horizontal line is not an energy level in the $3p_{3/2}$ multiplet.

Now suppose that through mental intent, a human can flip (that is, reverse) the spin of the valence electron. This will put the electron in the *lower* $3s_{1/2,-1/2}$ ground-state level. The laser will now be trying to send the electron from this lower level to the energy level indicated by the dotted line. But no level exists there, so LIF will stop and the ion will go dark. Suppose now that the human can flip the spin once more. Then the ion will light up again. If a person can cause this fluorescence for suitable long and short intervals of time, then he or she can send a message in International Morse Code. Anyone watching the output of the photo multiplier could read the message. The human could send the whole Preamble to the United States Constitution. For the first time in history, a physics-experiment would have shown that human thought indeed has a reality all of its own, and can affect matter.

To make the experiment more exciting, the photo multiplier signal could be sent to a computer programmed to turn the Morse code flashes into English plain text. This text could then be projected on a large screen using PowerPoint.

How might a human consciousness be interacting with the electron to flip its spin? Here I take a clue from quantum electrodynamics (QED). In QED, when one electron encounters another electron, the two push apart. This happens because one electron emits a photon, recoiling to the left, say, and the other electron absorbs it, recoiling to the right. This is illustrated in Fig. 2.

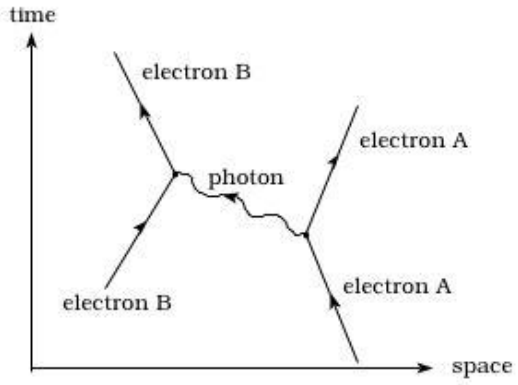

Fig. 2. "Like charges repel one another." Feynman diagram showing electron A, moving forward in time and to the left is space, emitting a photon and recoiling to the

right. Electron B, moving forward in time and to the right in space, absorbs the photon and recoils to the left.

Analogous to QED, I conjecture that a human consciousness, which I take to be a waveform, emits a quantum of some kind that is absorbed by the (magnesium ion's valence) electron and flips its spin. I will call the exchanged quantum simply "soliton". The reaction is illustrated in Fig. 3.

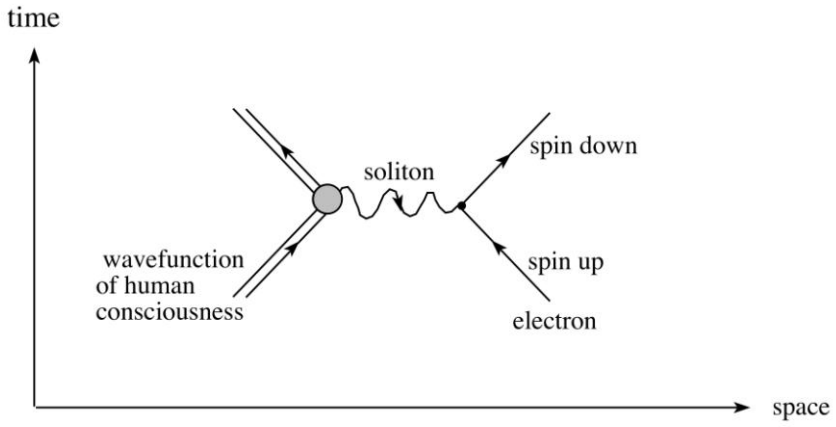

Fig. 3. A human's consciousness, taken to be a waveform or wave function, emits a soliton that is absorbed by an electron, causing its spin axis to change from along the external magnetic field ("up") to oppose the magnetic field ("down"). A soliton is a type of waveform that does not weaken with distance traveled.

What kind of field might this be, if it can transmit the intent of the human to the electron? It cannot be electromagnetic, because the electromagnetic fields outside a human are very weak and of short range.

Jahn *et al.* [Jahn, 1997] report that volunteers stationed great distances from the RNG were still able to alter the random-number distributions. If these volunteers' intentions were transmitted by field-quanta, then the field could not have been electromagnetic either because it did not weaken with distance as electromagnetic fields do, nor did obstacles such as buildings and hills impede it.

It must have been a new kind of field. If this new field propagated in higher dimensions as well as the familiar four of space and time, then this could explain why ordinary obstacles didn't block it. The field simply rose in higher dimensional space over the obstacles on its way to the target.

I will speculate that a new kind of field indeed transmits the intent of the human to the electron to flip its spin. In this regard, Rupert Sheldrake speaks of a morphic field, which links consciousnesses all over the world [Sheldrake, 1995]. Robert Monroe reports on an M-field which is operative both inside and outside ordinary four-dimensional space-time, is present in all matter from "inert" through micro-organisms to the human mind, and which can be modulated by human thought [Monroe, 1994]. Jane Roberts tells of consciousness units that are present in all matter and are responsible for ESP; these units are produced copiously when the sender feels strong emotion [Roberts, 1970]. Finally Swejen Salter tells of a five-dimensional life-energy field which can propagate in the higher dimensions as well as our lower four, links all matter, and like Roberts' field, is produced in great quantities when the sender is under strong emotional stress; this five-dimensional field conveys information in higher as well as lower dimensions, does not weaken with distance traveled, and is not impeded by obstacles [Salter, 1990].

The various fields just mentioned are similar enough that conceivably they could all be the same field. I will suppose this to be the case and call it the M-field

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If my proposed experiment is carried out and humans succeed in controlling LIF, then I conjecture that the M-field will have been responsible for the effect. If this is so, then I predict that these humans will also be able to control LIF from across the street, from across the state, and from across the country. We scientists will test these conjectures.

Such an M-field might also be what transmits human intent to bend a spoon, influence a RNG near or far, and mediate distant healing.

If a human is able to turn LIF on and off at will, then I suspect that the human's higher consciousness is controlling the LIF. If this is the case, then a person who has been able to send messages *via* LIF on Earth may still be able to send messages after he or she has left this life. Sending such messages would be smoking-gun proof that consciousness does not die when the body dies. Rather, that consciousness continues on, perhaps to materialize another body using what materials are available in the (possibly new) universe in which it finds itself.

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