Quantonomics: A discussion of the relationship between Rapid Eye Movement (REM) sleep, neural wave forms, quantum mechanics, social learning and cultural adaption.

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Definition:

Quantonomics: The relation of quantum theories to biological processes.

Episodic memories exhibited during REM are created as neurological wave forms. Quantum theory demonstrates mass behaves as waves and particles simultaneously. Subatomic particles tunnel through barriers. D-branes are theoretically multiple dimensions (10). Theories and proofs in various scientific disciplines, when combined, offer potential new insights into homeotherm social learning, memory management and networking.

Subject terms: REM DNA Quantum Mechanics Subatomic Particles String Theory Multi-dimensions social learning

Abstract

REM sleep research focuses on physiological characteristics and neurological activity. Research into subatomic particles concerns the natural laws governing our universe. Quantum mechanics has moved beyond theory to commercial applications. DNA and human genome research focuses primarily on human diseases and genetic causes and cures. The theoretical framework of this paper is the combination of these sciences; suggesting this combination produces a quantum framework, (quantonomic) which homeotherms (mammals/birds) access unconsciously via the quantonomic bridge (QB) during REM for multi–dimensional networking and information management.

Key Points

- All homeotherms experience REM sleep as a nightly occurrence. This unique sleep state has very specific physiological characteristics which are well documented, though the purpose is not fully understood.

- During REM sleep, studies have shown in multiple experiments, a replaying of daily events is the main neurological activity.

- Human fetal REM state begins approximately two months prior to full term. During this time REM is almost 100% for both the fetal (and newborn) sleep state. Within the quantomic framework, an explanation of this early sleep state is the construction of the quantomic bridge (QB).

- Quantum mechanics is a theory which seems contradictory to our understanding of nature. Much has been scientifically proven. Practical applications include the laser and the computer design field.

- Waves and particles, once thought entirely separate entities, are now proven to exist simultaneously. Experiments with light proved this theory by showing that light behaved as a wave and a particle.

- Quantum mechanics theorizes multiple, yet experimentally unproven, dimensions and/or universes. The quantonomic framework theorizes quanta information exchange between dimensions.

- The quantonomic framework includes subatomic particles, atoms, molecules, DNA, genomes, nucleus, cells, the fetus, REM sleep, neural wave forms, and finally circling back to quantum subatomic particles. All these elements produce a dynamic information channel which is useful to homeotherms for memory storage and networking.

- The QB is a neural mesoscopic wave which contains yet undetected qubits creating a data dense memory code for the purposes of transmission.

Introduction

Because of the intensity and single-minded concentration required for any scientific research, there is the possibility that contemporaneous discoveries in disparate sciences are not shared. Much has been discovered about our natural world through research during the recent century. These discoveries have accelerated–especially in biology, health, theoretical physics, subatomic particles, and sleep research. New discoveries and theories are published daily. It is not uncommon for the volume of this new information to overcome our ability to process it in a meaningful and holistic way.

Biological sciences and theoretical physics in the quantonomic framework are intermingled. This framework offers a new hypothesis concerning the purpose and capabilities of the REM sleep state found in all homeotherms.

The key to this hypothesis is within the various scales of connections in the quantomic framework. What happens within a cell (molecular) is at a different scale than the actions of subatomic particles. Neural oscillations are at a considerably larger scale as well. However, all these elements are intermingled, and actions at one measurement magnitude affects the actions in another.

Size does matter, and–as shown in recent experiments–we are learning the smallest of these elements may be the most influential to all aspects of nature–including the purpose of REM. Because of the breath of the quantonomic framework, each scientific area in this paper will be necessarily brief to keep the focus on the core hypotheses.

The cell

The human genome is contained within the nucleus of all cells in the human body; the exception being red blood cells. [1] The genome contains 23 chromosome pairs, each containing between 48 and 250 million letters (ATCG).[2][3] In total, the genome contains 3.2 billion letters and it is contained in the size of a pinpoint.[4][5] All homeotherms have a unique species genome dictating their structure.

This highly complex code is responsible for everything we are, how we grow, live and to some extent when we die. Currently, the function of the majority of individual DNA elements is yet to be discovered.[6][7]

The first part of the quantonomic framework states that the unique DNA code each member of each species has allows that member to access their "cloud" computer. Their unique DNA code acts as a multidimensional address–similar to a web address–allowing for the transfer of quantum information to their specific network. (It is shown in figures 1 to 4 as the deck)

REM basics

REM sleep has been widely studied for many years. As equipment for measuring the neural network locations and neural oscillations has improved (EEG, fMRI), so has our knowledge.

Here are the basic facts:

1. There are 4 states of sleep.[8][9]
2. REM is unique among these states in a variety of ways.[8][9][10][11][12]

3. REM is an acronym for Rapid Eye Movement
4. REM is a common unconscious nightly neural activity with all homeotherms.[13][14][15]
5. During REM the characteristics include:
    A. Focused rapid eye movement [15][16][17]
    B. Body paralysis [17][18]
    C. Increased heart rate and breathing [19]
    D. Neural activity including neural ensemble mimicking the episodic memories of the previous day. [20][21][22]
    E. Episodic memories are autobiographical memories (who, what, when, where and why), in a context that is able to be stated or conjured. [21]

Episodic memories are central to this paper's hypothesis, suggesting that daily memories are transmitted and shared to a network located within another dimension. There is evidence that these replays of daily events are the main activity while homeotherms are in the REM state, though the purpose is still undefined. [23][24][25][26] Research indicates that the default network (DN) and the medial temporal lobe (MTL) are neural networks active during both the daily events and the episodic memory recall during REM. [21] In one research project construct, human subjects showed the same neural networks were active both during viewing a film and later during REM - a spontaneous recall. [22] The hippocampus is linked to episodic memory. [21] In rat studies, the hippocampus was involved in reliving maze routes to access food. [20]

From these research projects and others, it is clear that REM provides a time for the brain to create an unconscious (wakeful resting) state that is conducive to reliving the day's events. The complicated structure of memories requires the synchronized firings of various neural networks which is handled by the hippocampus. [21] These ensembles of neural networks create mesoscopic oscillations (waves) that are much more rapid than the reuse of memories to physically follow routes memorized previously. [20] It appears that REM memories are in the fast forward mode, and the same memories are played in normal speed when recalled during waking use of the memories in the days following. [20][21]

Mesoscopic waves and code

Current research into the neural network activity is being done by comparing wave patterns as well as areas of the brain during the activity. Both EEGs and fMRIs are involved in these studies.[27] The shapes, frequencies, amplitudes and location are being compared, but not the potential code contained within the wave forms. [27][28][29][30][31][32]

For events as complicated as memories to be robustly recorded, there needs to be large data, indexed and saved to be accessible in the future. These data must be contained within the

mesoscopic waves generated during any recall–including REM–simply because the information and details of memories are nowhere else to be found, and we know that memories exist.
The focus of this paper is not how memories are stored within the brain, but the use of the mesoscopic waves during REM to reconstruct and share memories stored within the brain.
There is a good deal of interest in how the neural networks store information, and quantum mechanics is considered as possibly the framework behind this capacity of the brain. [33] The world of subatomic particles could well be the key to much of our biological activities - even the state of conscious.[34]

This paper hypothesizes that quantum particles/waves contained within the mesoscopic generated waves during REM carry the daily information as a vast array of qubits. These quanta have characteristics already proven to allow them to both tunnel and entangle, which play an important role in the quantonomic theory regarding the transmission of information.[33][34] Quanta have been successfully used to store information as the first steps toward a new breed of super computer. [35]

A thought experiment: A quantonomic bridge (QB) containing qubits of code

Viewing the EEG readouts, we see an analog wave signal in two dimensions. This is because the equipment records frequency and amplitude of the overall signals produced. It cannot record other possible information or codes within the wave form. We can only observe what the equipment can detect and measure, not possible codes contained within the wave form.

As an experiment in viewing the neural waves created during REM sleep, think of a suspension bridge. There is a flat part which carries traffic (the deck) and towers that hold the highest point of the suspension cable (main cable) which arches between the towers. Additionally there are many vertical cables (suspender cables) connecting the long arching suspension main cables with the deck beneath. (fig.1)

The somewhat similar quantonomic bridge (QB) carries codes but does not support a roadway. The QB has the main cables which arc up and down creating various frequency and amplitude shapes seen in an EEG readout. The vertical suspender cables of the QB from the main cable to the deck represent a the distance and angle of attachment of a qubit, or element of information. These qubits carry information as code from both their attachment length and degree of angle from the deck–as well as the multi-state information of the qubit itself. (fig. 2)

The suspender cables of the (QB) do not have to be vertical. They point in any angle (or degree) around a core deck. Therefore, each QB qubit of code has a length and angle code value in a three dimensional space. (fig. 3) Additionally, there are more than one qubit cables attached to the deck at each attachment point. Therefore there could be many lengths and many direction cables containing qubits of information at a specific attachment point on the deck.

The QB bridge is a time bridge. In other words, the length of the bridge (or deck) is completely flexible based on the requirement of the viewer. When REM is recording, the bridge is shortened and the time line (or deck) is compressed. When a person is awake and reliving the memory, the bridge can be stretched to allow re-enactment in a more traditional speed. At any speed of encoding or decoding, all the qubit cables remain connected in the same location with the same length and direction–ensuring a synchronized playback of the ensemble components of the QB.

Unwrapping the mesoscopic neural code would find that each neural network synchronized into an ensemble by the hippocampus is assigned a consistent angle of connection to the deck. (fig. 4) This would allow the memory of a single instant to carry an incredible amount of data points, or qubits. For something as complex as a memory of events lived requires far more than an analog wave form. The inclusion of a limitless number of qubits assigned to various components of memory creates a robust code structure that can be transmitted as well as decoded and saved.

As with all radio station signals, the QB would need a carrier signal to ensure it is being received in the proper location. Think of the deck at the center of the cable connections as being the carrier signal. The deck is designated as an exclusive carrier signal by the fact that it is coded by portions of DNA within the genome of the broadcast station–the specific homeotherm genome. The principle is the same as a radio station which has a broadcast frequency it always uses. Each night during REM, homeotherms broadcast memory information with their personal DNA carrier code.

Illustrations: Quantonomic Bridge architecture (Fig. 1 - fig. 4)

Figure #1 Suspension Bridge

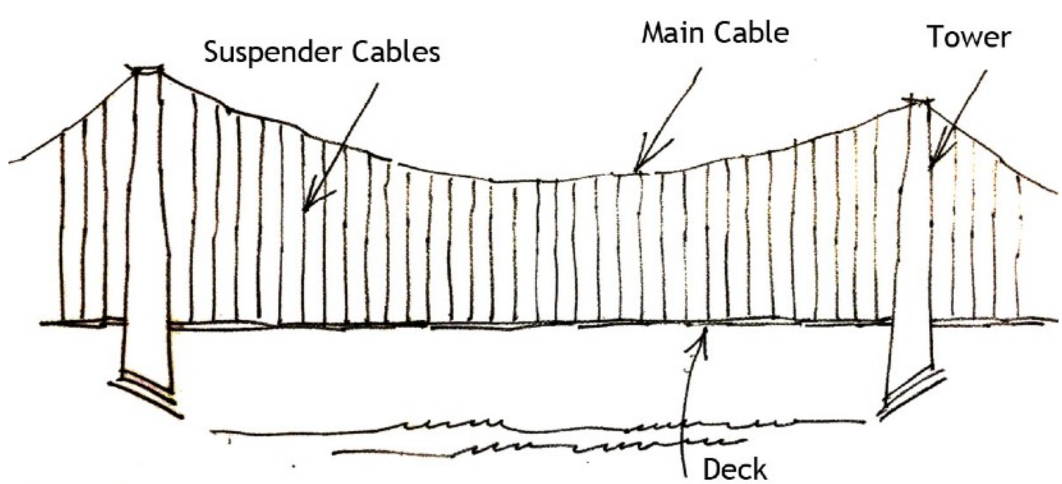


Figure #2 - Mesoscopic Wave

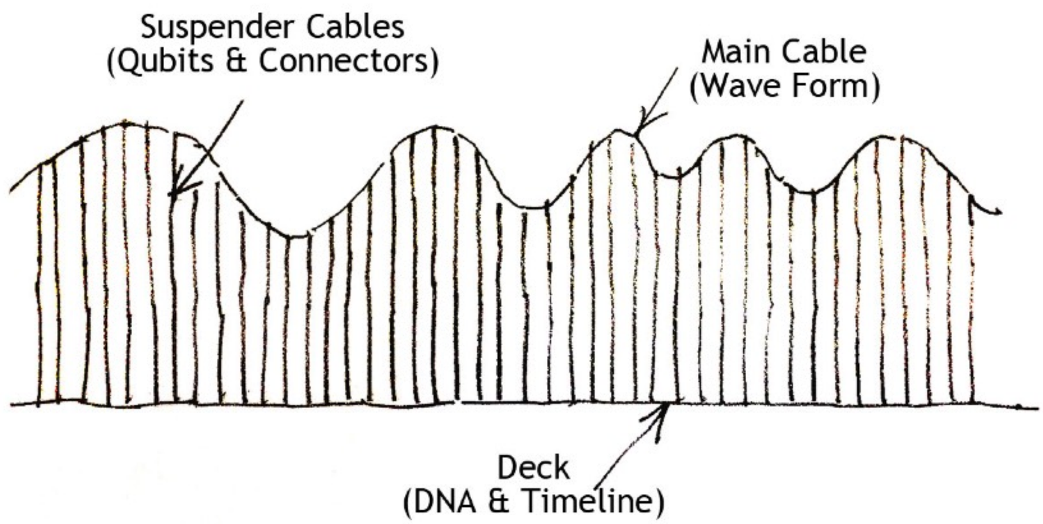


Figure #3 Multiple Qubits

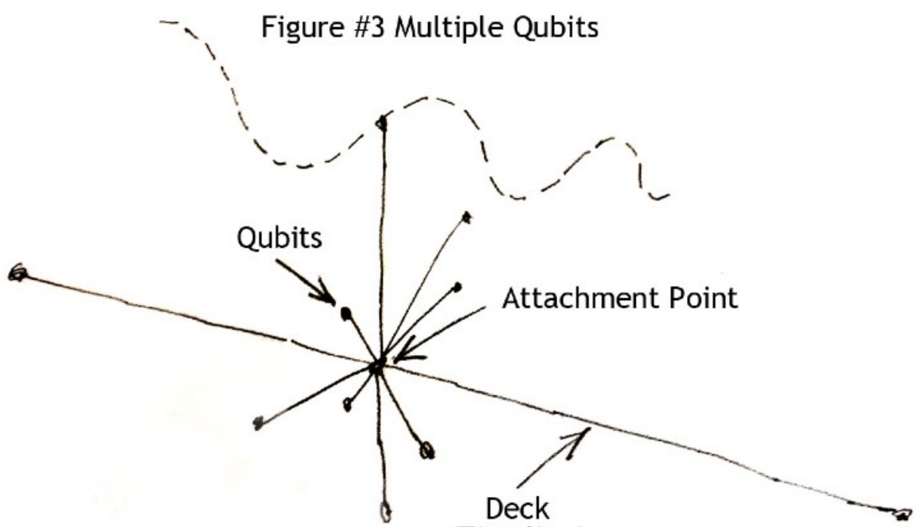
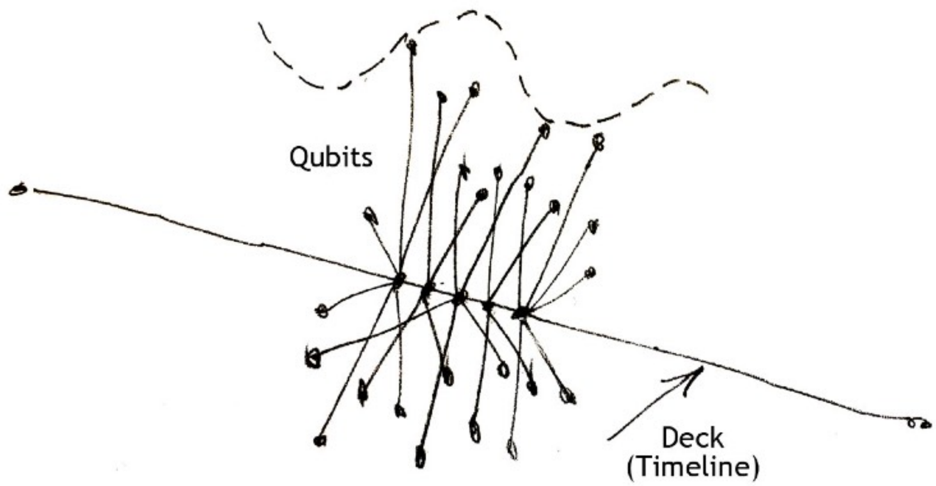


Figure #4 Multiple Qubit Attachment Points



Quantum mechanics and traditional physics

Traditional physical laws of nature offer certainty. Characteristics of measurement like size, shape, volume, location are measured exactly and use traditional math.[36] Quantum rules do not offer certainty - in fact the opposite. Quantum rules offer probability of values.[37] Primarily quantum laws regard very small parts of our universe–subatomic particles.[38] However, as all matter is made of these particles, all matter (and energy) is affected and controlled by these laws as well as traditional physics.[36]

Traditional physics sees an electron orbiting as a subatomic particle around a nucleus similar to a planet around a sun. The electron is a particle with a negative charge and the nucleus is carrying a positive charge.[39] Quantum laws see the electron as both a particle and a wave in a probable orbit around a nucleus carrying the same charges, but not in any one predictable location.[39][40][41][42] This seemingly small difference both in scope and concept is very large to theoretical physicists and our universe.[37]

Quantum mechanics and the transmission of information

A recap: Our quantonomic framework has so far determined that REM does produce mesoscopic waves which relive daily events. We also maintain that these waves have an embedded code because we know memories do exist, and they must be contained in the the neural waves. To complete the bridge or transmission of memory codes, quantum tunneling and entanglement come into play, as well as the quantum theories regarding multi-dimensions.

Quantum theory, tunneling and entanglement

Tunneling refers to the fact that quantum waves have the capability of tunneling through a barrier that in classical physics should not happen. Tunneling is based on the probability that a certain amount of electrons (particles and/or waves) will pass through the barrier. The wave loses energy crossing the barrier.[43][44][45]

Quantum entanglement is the characteristic that two particles, once entangled–then separated, will react to changes in each other.[46][35] A change in the spin of one, causes a similar change to take place to the other particle, regardless of the distance between the two. [40]

Both these quantum characteristics are part of the quantum theory which is a dramatic step in the understanding in how the world of atoms and their particles behave. These rules of natural physics have helped new fields of study and furthered experimental usages.[47]

At the beginning of the paper, the hypothesis is that information–in the form of quantum waves–was being shared between multiple dimensions. The process of the transmission and interaction is due to the quantum characteristics of particles and waves–especially with regard to their unique abilities crossing over and communicating through barriers–tunneling and entanglement.

Quantum theory and dimensions

Multiple dimensions and universes are part of the quantum theory.[48] These dimensions–sometimes called universes–are still theoretical. Proving their existence is one of the goals of the experiments taking place at the Large Hadron Collider (LHC) facility.[49][50] By colliding subatomic particles at near the speed of light, the hope is to determine what other particles are revealed, and with them additional evidence about our universe and the existence of other universes as well.[50][51]

One quantum dimensional theory is the D-brane theory.[52] Currently it is considered one of the contenders best supported by mathematical formulas.[52] It is an extension of the string theories that have evolved since 1970.[53] The D-brane theory specifically counts 10 additional dimensions to our own.[52] In our dimension, we exist in a three dimensional space, the D-brane dimensions are theorized to be two dimensional, and potentially very close to our universe and each other.[51][52] Similar to sandwich wrap stretched over our universe. D-Brane current theory states that particles cannot travel between them.[51] However, quantum theories regarding multiple dimensions are an ever changing landscape. [54]

Another theory, called the *Many Interacting Worlds* (MIW) acts entirely differently, as the name suggests. Professor Howard Wiseman and his collaborators Dr. Hall and Dr. Dirk-Andre Deckert see the multi-worlds in a new way.[55] The three characteristics are a.) our universe is just one of a gigantic number of universes, b.) that these worlds are as “real” as ours and c.) quantum mechanics tend to repel similar worlds. (suggesting the worlds nearest to us are dissimilar to ours).[55] The important new concept of the MIW theory is that “All quantum effects arise from, and only from, the interaction between worlds.”[55]

This paper hypothesizes that there are multiple dimensions with which homeotherms can interact during REM–not which theory is correct.

The mystery in Wytham Woods

In the 1920’s, when milk was delivered in glass bottles to home doorsteps–and it was not homogenized–residents noticed strange small holes poked into the bottle’s foil caps. It didn’t take long to catch the cream thieves in the act–the great tit (*Parus major*).[56]

Wytham Woods is next door to Oxford University. Beginning in the 1940’s, research began at the university, after the revelation that these birds seemed to be teaching one another how to puncture the caps to access the cream. One of the main purposes of the research was to determine if the learning was on the DNA level, or the social learning level; nature v.s. nurture. For the learning to be shared via DNA, it would require a new generation for the learned trait to appear. This would include both hard inheritance as well as soft inheritance.[57][58][59]

For the trait to spread within the same generation, the conclusion is that social learned ways of accessing food sources are passed between the birds by visual demonstration and imitation.[60] Dr. Lucy Aplin created a specialized study proving that the information was shared via social learning.[61] This study was specifically outdoors, away from the lab environment, to ensure the findings held up in a natural setting for the birds.[61]

A proposal for further studies similar to Wytham Woods.

To determine if species share information (network) during REM sleep, a possible experimental structure would be as follows: Follow the basic protocols used in Dr. Aplin's Wytham Woods studies, but eliminate the possibility of visual or auditory sharing. If, after a period of time, unique feeding activities spread across a localized species within the same generation, it would point to a social learning channel that is not currently known–opening the possibility of a REM quantomic network shared by the study’s species group.

Summary

This paper suggests that further experimentation to confirm the quantonomic framework (and the QB) would be beneficial to fuse quantum theories with the biological effects on homeotherms. Quantum laws and biological laws are part of all natural laws, and to meaningfully integrate them–including multi-dimensional networking–will provide additional understanding into our universe(s) and our place within them.

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