

Current Research Status

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Topics

- Research methodology
- Self-conscious mind
- Further work - interaction
- Further work - verification of veridical NDE OBE perceptions
- Tucson conference highlights
- Phantom limb research
- Brief comments on *Irreducible Mind*

Research methodology

- *Goethean* phenomenology (Zajonc, 1999) involves investigation through:
 - empirical phenomena,
 - phenomena arising from systematic experimentation, and
 - "archetypal phenomena" which permit a direct intuition of the laws of nature
- "The phenomena themselves are the theory" (Goethe, in Bortoft, 1996, p. 71)
- Archetypal phenomenon is "an instance worth a thousand, bearing all within itself" (Goethe, in Bortoft, 1996, pp. 22-23)
- We believe the OBE component of the NDE is the *archetypal phenomenon* that best shows the nature of the mind-and-body
- Research should proceed in two phenomenological directions:
 - NDE phenomena
 - neuroscience phenomena that are suggested by NDE

Self-conscious mind (SCM)

NDE OBE phenomena strongly suggest:

- consciousness can continue with no electrical brain function
 - from apparent continuity of consciousness with the cessation of brain function during cardiac arrest
- consciousness can separate from and operate independently of the body
 - from the veridicality of NDE OBE perceptions, many of which are verified informally
- the same human being exists *out of the body* during the NDE, freed of the constraints and limitations of the body, and exists *within the body* before and after the NDE
 - from the overall phenomenology of the NDE OBE

We propose the existence of a **non-material *self-conscious mind*** as a “field of consciousness” (Mays and Mays, 2008). Ordinarily, the SCM operates as an autonomous entity, intimately united with body and brain, operating through the *mediation* of the brain.

Self-conscious mind (SCM) - physical interaction

The **non-material** SCM:

- a “**field of consciousness**”, the region of space where a person’s consciousness exists
- nonetheless can **interact** with physical processes of the brain

Evidence of **subtle interactions** in different modalities in NDE OBE:

- NDEr “body” generally has an apparent spatial form
- apparently can be sensed by animals (Corcoran, 1996, p. 81)
- apparent intricate, luminous structure (Moody and Perry, 1988, p. 10)
- apparent interaction with physical energies: NDEr “sight” interacts with ambient light providing veridical visual perceptions, and “hearing” interacts with sound vibrations from heart monitors, fluorescent lights and human speech to provide veridical auditory perceptions

Self-conscious mind (SCM) - physical interaction...

Evidence of **subtle interactions** in different modalities...

- apparent subtle interaction with solid objects: a slight resistance in passing through objects, the ability to “bob” against the surface of the ceiling or feel the support of the hospital roof
- apparent interaction with another person’s physical body:
 - sensing the doctor’s arm had a “very rarefied gelatin” consistency, with an electric current running through it (Moody and Perry, 1988, pp. 8-9)
 - being able to tickle another person’s nose until the latter sneezed (Corcoran, 1996, p. 83)
 - “merging” with another person’s body to see and hear through their eyes and ears (Morse and Perry, 1990, p. 177; Greyson and Bush, 1996, p. 223)

Phenomena of apparent physical interaction support the view that the self-conscious mind is able to interact in some physical way with the brain, through the neurons.

Self-conscious mind - neurological evidence

Evidence from neurological phenomena suggest a *non-neural agency* induces conscious experience and self-consciousness:

- subjective antedating of sensory experiences (Libet, 1973; Libet, Alberts, Wright, Lewis, and Feinstein, 1975; Libet, Wright, Feinstein, and Pearl, 1979)
- "plastic" neural changes from purely endogenous mental "practice" (Pascual-Leone, Dang, Cohen, Brasil-Neto, Cammarota, and Hallett, 1995)
- changes in neural patterns in OCD through "mental force" of cognitive behavioral therapy (CBT) (Schwartz, 1998, 1999)

Note that Global Workspace Theories (GWT) (Baars, 1997; Dehaene and Naccache, 2001) do not adequately explain *conscious initiation of endogenous mental activity* except via "supraneural" capabilities (evaluation of adequacy, awareness of context) and subconscious or statistical "selection among competing goals"

Application to neurological phenomena

In principle, all neurological phenomena should be explainable in terms of the autonomous SCM interacting with the brain.

- **Libet's delayed awareness of willed action** (Libet, 1985; Libet, Gleason, Wright, and Pearl, 1983)
 - Neural "readiness potential" (RP) appears to begin about 350 msec before reported awareness of wish to flex the wrist (W)
 - We propose that *all* mental events, including endogenous events such as the wish to act, begin subconsciously and have a time-on requirement of about 500 msec (cf. Libet, Pearl, Morledge, Gleason, Hosobuchi, and Barbaro, 1991). The time-on requirement reflects the process of "**coming to awareness**".
 - Thus the *subconscious* wish to move occurs 150 msec *prior to* onset of RP
- **Phantom limb phenomena:** the spatial region of the phantom limb should extend beyond the stump and exhibit some of the properties of the NDEr "body":
 - subtle interaction when a physical object enters the spatial region of the phantom, possibly causing physical sensations
 - subtle interaction of phantom limb with another person's physical body, which could be felt by the other person
 - possibly a faint glowing of the phantom in the dark

Just what is the self-conscious mind?

- SCM carries all the faculties of cognition; the brain must *mediate* these faculties when in the body
- SCM is non-material (passes through matter, is weightless, invisible to ordinary sight, etc.) but is capable of subtle physical interactions
- Is the SCM a sort of “subtle substance”?
 - doesn't fit well because it implies that the SCM can be divided or cut up: doesn't appear in any NDE narratives we have read (but see Howard Storm (2000) account of painful “injury” to his “body”)
 - rather, the SCM is more the locus of the person's consciousness, where the person's essential self-hood or “being” is
 - more like a “field of consciousness”, borrowing from the usage in physics: a field is a region of space that has certain properties
- SCM appears to extend throughout the body:
 - apparently with a luminous internal structure (cf. containing “tubes of light”, Moody and Perry, 1988, p. 10)
 - possibly corresponding to physical structures such as neural pathways

Further work - interaction during NDE OBE

Compile further cases of subtle interactions and publish a paper

- Short article and research request published in recent issue of *Vital Signs*
- Some very good items received from P.M.H. ("new news" to us):
 - During his NDE, George Rodonaia was "**inside his wife's head**" as she was picking out his grave and heard all of her thoughts (confirmed by his wife Nino):
 - she was making a mental list of eligible men to date, with their characteristics
 - George later repeated all these details to her, freaked her out
 - also Rodonaia was **apparently "seen" by the new-born infant** of a friend of his, who had suffered a broken hip
 - Another case of **a child "seeing" or "hearing" an NDEr** is the "white boy burned black": story of Margaret Fields Kean in *Beyond the Light* and *Big Book of NDEs*
 - An unpublished case is of a man driving outside Portland, OR around midnight, foggy, swerved on black ice and crashed into a tree, severing his arm:
 - In his OBE he sought help from a house a distance away, outside the second story window, he jumped up and down and shouted to get the police
 - The man told the police that the "**fog outside his window was jumping**" and seemed to have the **shape somewhat like that of a person**
- Further investigation of existing cases where that is possible: more details (e.g. Jerry Casebolt)

Further work - verification of veridical perceptions

Expand on material omitted from earlier paper

- Expand on requirements for verification and corroboration (from Kelly, Greyson, and Stevenson, 1999-2000)
 - Examples of well-verified veridical cases
 - Problems with verifying earlier NDEs
 - Need for purely visual perceptions (cf. Blackmore's (1993) objections)
 - Build on Jan Holden's conference presentation (2006) or her subsequent paper
- Hidden targets versus human interaction
 - NDErs tend to direct their interest based on human connections
 - NDErs respond to calling out of her name
 - NDErs will direct their attention to someone who directly addresses them
 - Propose a randomized verbal protocol, which is communicated to the patient mentally when the patient is likely to be having an NDE
- Quick response verification team
- Details, details, details
- Verification long after the fact, for example:
 - George Ritchie's memory of the night sky during OBE to Vicksburg (no luck)
 - Details of Vicksburg cafes from the time (newspaper archives) and now
 - Memories of Maria and her shoe, details from the video reenactment

2008 Tucson Consciousness Conference

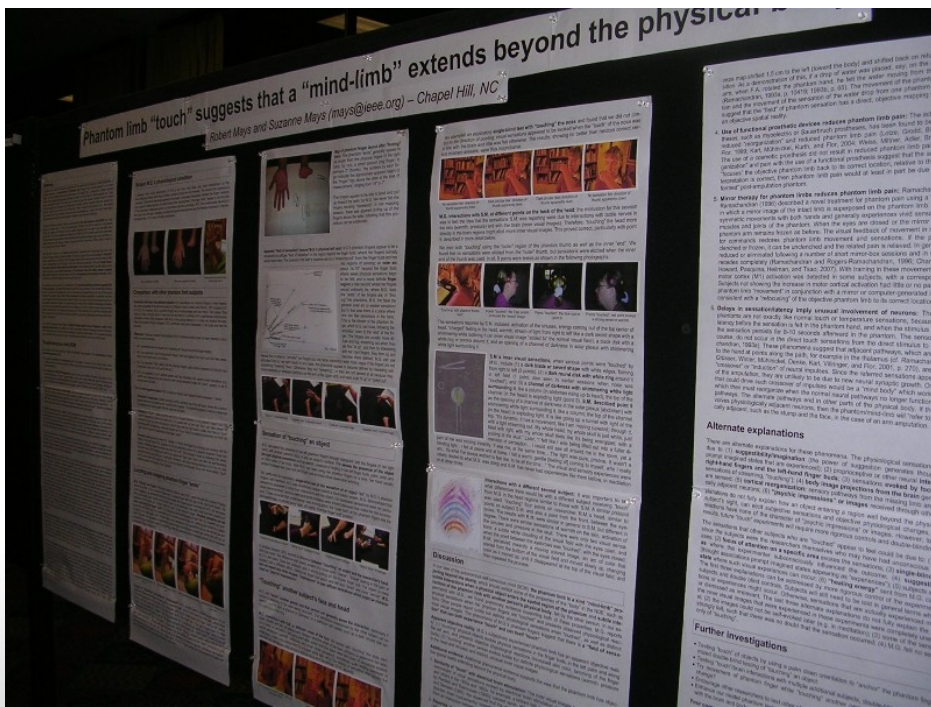
Toward a Science of Consciousness - a few highlights

- Panel on Libet's delayed awareness of willed action: some good replication of his results (test speech acts rather than limb movement) but other study introduced confounding of factors (added delays to perception of response)
- Descriptive experience sampling (DES) method: interesting result for bulimia nervosa patients: their thoughts are not on body image but preoccupation with tasks
- Vegetative state (VS) patients: reliable fMRI signatures for "playing tennis" versus "walking around your home"; there are now two patients (out of 17) and both have now progressed to minimally conscious state (MCS)
- Rupert Sheldrake presentation: (telepathy between pets and owners: a dog and an African gray parrot, plus the sense of being stared at study); accompanied by three "balancing" responses; Sheldrake held his own; note: the experimenter is a factor in the experimental results!

2008 Tucson Consciousness Conference...

Poster session

Phantom limb “touch” suggests that a “mind-limb” extends beyond the physical body



Phantom limb research – relevance for NDE

- NDE OBE is the starting point, the archetypal phenomenon
 - Further work needed on interaction, verification of veridical perceptions
 - Other areas?
- Research can be carried out in two directions:
 - Further in the direction of NDE transcendent phenomena
 - Further toward neurological phenomena demonstrating mind-brain interaction
 - Insights from validated neurological phenomena help support the validity of the interpretation of NDEs
- We want neurological phenomena:
 - that can show unequivocally the reality of the autonomous mind
 - that have unexplained anomalous features
- Phantom limbs fit these requirements

Phantom limb research - summary

- In exploratory experiments with one subject (M.G.), we found *preliminary* evidence indicating:
 - subtle interactions when a physical object enters the spatial region of the phantom, causing physical sensations in the body
 - subtle interactions of the phantom limb with another person's physical body, which are felt by the other person, including unusual inner visual sensations in the other person
- We encountered methodological problems in the experiments, most notably failure to control precisely where the interactions were directed, so the results were inconclusive
 - Still, interactions with M.G.'s fingers *do* occur; they have the character of physical or physiological sensations rather than “psychic impressions”
- M.G.'s phantom fingers appear to have an **objective reality** in the space beyond her body
 - “fields of sensation and touch” extending beyond her physical hand
 - other limb-deficient subjects should experience similar effects
- If this view holds, the phantom limb can be used to study the physical interaction of the mind with the brain

Subject M.G.'s physiological condition

Palm up view



Palm down view



Side by side



- congenital digital agenesis of the left hand
- initial development of the five metacarpal bones which was arrested, probably during the first trimester
- thumb metacarpal appears to be nearly completely developed, whereas the finger metacarpals appear to have reached only about half of their development
- finger “buds” appear to be the ends of the shortened metacarpal bones or rudimentary proximal phalanges.

Comparison with other phantom limb subjects

Similarities with other limb-deficient subjects:

- the fingers are normal shape and can move, with **proprioceptive sensations** of them
- the fingers **appear** (“light up”) when thought about or when her left arm rests on a surface; they **disappear** when M.G. is not paying attention or is using her physical left hand; they **feel telescoped** in the upper arm near the shoulder

Differences:

- M.G. sometimes feels her fingers as “**streaming out**” beyond normal finger lengths
- M.G. can **apparently “touch”** the phantom “fingers” with the fingers of her right hand and feels sensations in both hands and up the left arm
- M.G. can **apparently “feel” objects** with the phantom fingers, again evoking sensations in the left hand (finger buds, palm, etc.) and up the left arm
- M.G. can **apparently “touch” another person** with her phantoms, who reports tactile sensations (warmth and pressure) and also unusual inner visual sensations when the “touch” appears to be directed toward the brain.

Locating and mapping phantom finger “ends”

With eyes closed or looking away, M.G. goes through the process of feeling where the “ends” of her phantom fingers are, by **pulsing them with the tips of the right-hand fingers**. There are two points: a **weaker point**, about a foot away from the “end”, where there is the first sensation of the finger, then a **stronger point** much closer where the finger “end” is felt, where there is a firmer sensation both in the right finger and in the finger bud.

Weaker thumb point:

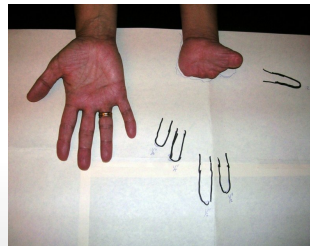


Thumb "end":



The “**ends**” appear to be somewhat farther out than where her fingers would normally be. M.G. can feel something more subtly even further out than the “ends” of her phantoms. Her right finger tips feel a warmth and resistance at the point of “contact” with the “end” of the phantom finger.

"Map" of the fingers:



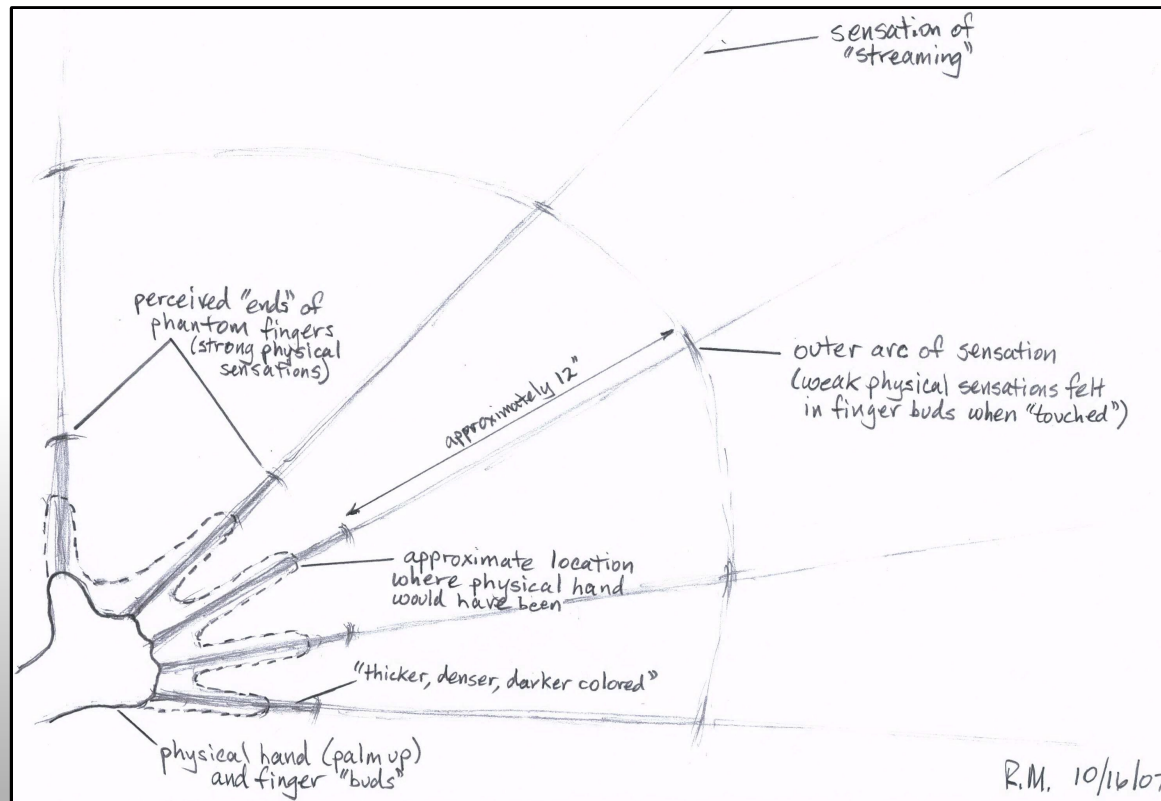
Physical sensations are felt when activating the finger “end”: (1) a tingling in the corresponding finger bud, (2) a warmth and pressure in the left palm, and (3) a sensation on the outside surface of the arm going up the forearm to a specific spot in the outer upper arm.

Apparent “field of sensation” around left hand

The phantom limb field is experienced as a “streaming out” from the finger buds and has two regions of sensing:

- **an outer arc** about 14-18" beyond the finger buds where weak physical sensations begin to be felt
- **a more definite finger region** a little beyond where her fingers would ordinarily be,

In “finding” her phantoms, M.G. can trace the stream of the phantom finger, following the sensation down to the “end” of the finger. The phantoms appear to become defined by interacting with something “meeting” them. Otherwise they are “streaming”, or they are not sensed at all.



Sensation of “touching” an object

- M.G. can sense the presence of an object:
 - **through physical sensations** warmth, pressure or tingling in her left finger buds, palm, wrist, arm or other areas of her body.
 - after using her phantom fingers for a time, her hand usually shows objective **increased skin color** and her finger buds at times show **observable twitching**
- In an exploratory experiment, M.G. demonstrated that sensations appeared to occur from interactions with the object
 - repeatable sensations were **not conclusively demonstrated**
 - serious methodological problems were evident afterwards that make the test inconclusive (incorrect alignment of object with phantom “end”)
- M.G. did not report any other things, such as images, “impressions” or less diffuse sensations which might be characterized as **“psychic impressions”**

Pulsing to locate phantom thumb



Testing “touch” of phantom thumb



“Touching” another subject's face and head

M.G. can “touch” another person and that person can generally sense the interaction

- particularly if he/she is attending to the area being “touched”
- sensations can include warmth, pressure, or an **inner visual sensation**:
 - a white light, a shadow or darkness, or a particular light pattern such as a dark circular disk surrounded by a white ring

An exploratory test “touching” the nose was inconclusive:

- we did not control for the direction of pointing
- visual sensations appeared to be evoked when the “touch” of the nose was in line with the brain; little was felt otherwise (some warmth, etc.)
- we then focused on “touching” the head

“Touching” left cheek
(eyes are taped shut)



Pointing to sensation of warmth
felt (confirmed by M.G.)



“Touching” the nose
with image of dark ring



“Touching” another subject's face and head...

- We reasoned that the sensations S.M. was reporting were likely due to interactions with tactile nerves in the skin (warmth, pressure) and with the brain (inner visual images).
- Therefore, “touching” the head more directly in the brain regions might elicit more inner visual images. This proved correct.

“Touching” with phantom thumb “end”



Points “touched”: the 3 top points produced “sword” image



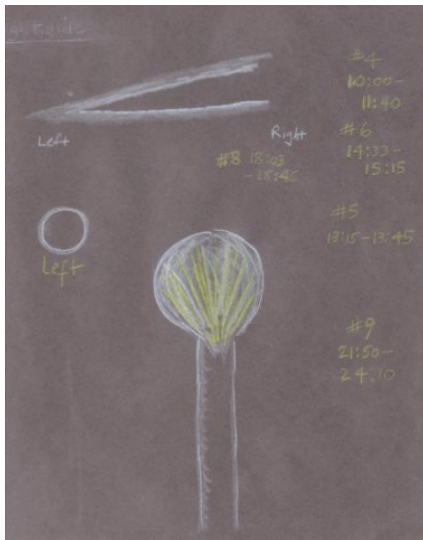
Points “touched”: the blue spot is point 9



“Touching” another subject's face and head...

S.M.’s inner visual sensations, when various points were “touched” by M.G., include

- a **dark blade or sword shape** with white edges, forming from right to left (3 points)
- a **dark round disk with white ring** around it in left field (1 point, also earlier)
- a **channel of darkness with white light surrounding it**, rising up to the head (point 9).



Point 9: the opening of a channel of darkness in the solar plexus (abdomen) with shimmering white light surrounding it, like a column; the top of the channel, in the head, is exploding light. It is like going up a tunnel with light at the top. “It’s dynamic, it has a movement, like I am moving (upward) through it, with a light streaming out. My whole head, my whole skull is just white, just filled with light, with my whole skull feels like it’s being energized, with a pulsing of the skull.” Later, “I felt like I was being lifted out into a fuller dimension of perception... I could still see all around me in the room, yet a part of me was moving inwardly. It was me, at the same time... The light was pure, pristine. It wasn’t a blinding light... I felt at peace and at home. I felt a warm, gentle [feeling of] coming to myself, who I really am... It’s what I’ve always wished to feel like, to be all the time...”

The visual and sensory experiences were **clearly related to what M.G. was doing** and S.M. has **never had experiences like them before**, in meditation or at other times.

Phantom fingers have apparent objective reality

M.G.'s subjectively experienced phantom fingers have an apparent objective reality:

- “touching” physical objects evokes physical sensations in the finger buds, in the left palm and along the left arm, and presents objective physiological reactions
- “touching” another person evokes subtle but definite physiological sensations (warmth, pressure in the head and sinuses) and distinct, unusual inner visual images

Additional phenomenal evidence supports the view that the phantom limb has objective spatial reality extending beyond the physical body:

- Similarity of visual images from “touch” with electrical brain stimulation
- Reported visual perception of phantoms: subject A.Z. (Brugger, Kollias, Müri, Crelier, Hepp-Reymond, and Regard, 2000)
- Tactile sensations follow subjectively felt movement of phantom hand
- Use of functional prosthetic devices reduces phantom limb pain
- Mirror therapy for phantom limbs reduces phantom limb pain
- Delays in sensation/latency imply unusual involvement of neurons

Phantom limb research: further work

- Test “touch” of objects by using a palm down orientation to “anchor” the phantom fingers plus randomized double-blind testing of “touching” an object
- Test “touch”/brain interactions with multiple additional subjects, double-blinded if possible
- Try movement of phantom finger while “touching” another person: does the sensation also move or change?
- Test if another person can “find” M.G.'s fingers while M.G. is blindfolded*
- Test phantom fingers in dry ice “fog” (cf. fog “jumping”, NDEr having a shape in fog)
- Use sensitive detectors (e.g., luminosity, pressure) to detect phantom fingers*
- Encourage other researchers to test other phantom limb subjects experiencing this phenomenon
- Enhance our model phantom limb phenomena as the result of the interaction of the self-conscious mind with the brain and body

* Our thanks to members of Division of Perceptual Studies, University of Virginia for these suggestions

Irreducible Mind – some thoughts

- Excellent exposition, extremely comprehensive, broad reformulation of the entire field of psychology
- Non-Cartesian dualist interactionism: reasons to remain dissatisfied (p. 629):
 - What is the relationship between brain processes and mental activity? What is the solution to Chalmers' “hard” problem?
 - What part of the “cognitive unconscious” goes with the brain and what part with the psyche and how are they coordinated?
 - Where do psyches come from in individual development? How did psyches evolve with the evolution of the species? Where and how did consciousness begin?
 - How can the psyche subsist independent of the brain?
 - Postmortem survival necessitates some sort of “subtle” physical body
- Neutral monism – top-down framework (p. 637)
 - Human personality is made up of the same kind of “stuff” throughout, a hierarchy of levels or strata
 - Strata are interconnected and coordinated by a “subliminal self” or an underlying, pervasive consciousness (is this a form of panpsychism?)
 - No “being” or psyche survives death, but the outer physical body simply “dissolves” and functionally ceases to play a part

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