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ENHANCEMENT OF IMAGES OF POSSIBLE MEMORIES OF OTHERS DURING EXPOSURE TO CIRCUMCEREBRAL MAGNETIC FIELDS: CORRELATIONS WITH AMBIENT GEOMAGNETIC ACTIVITY[1]

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Summary.—On the basis of results from a special subject who reported information at a distance during exposure to weak, circumcerebral magnetic fields rotating within the horizontal plane, we designed an experiment to discern if the subjective narratives of normal people exposed to these fields could be similar to the comments of emotionally related individuals who were concurrently generating shared memories about a randomly selected stimulus. Blind matching of the comments indicated that the proportions of 44 students who accurately paired the narratives of the field-exposed subject and the comments of the stimulus person as congruent were statistically significant for 5 of the 7 pairs whose narratives were of sufficient length for analysis. The ratings for congruence of the pairs of verbal behaviors for the 7 pairs of subjects were negatively correlated ($rho = -.72$) with the geomagnetic activity during the 24-hr. interval within which the experiences were conducted. The results suggested consciousness might also be an insulator to myriad stimuli which might be accessible when brain activity is modified by circumcerebral magnetic fields with temporal configurations in the order of 20 msec.

Human experiences generated by the human brain reflect a minute proportion of the potential combinations of energies and stimuli available in the natural environment (Norretranders, 1998). One of the primary correlates of consciousness and awareness are the recursive and cohesive neuroelectromagnetic fields that are generated within and move through the cerebral manifold (Edelman, 1989; Llinas & Pare, 1991; Pribram & Meade, 1999). These fields display phase shifts and increments on the order of 10 to 25 msec. Changes in the rate of brief pulsed magnetic fields in a counterclockwise direction around the cerebral volume slows subjective time (Cook, Koren, & Persinger, 1999) and may interact with these neuroelectromagnetic fields (Richards, Koren, & Persinger, 2002).

Normal consciousness may also be perceived as an insulation from the myriad stimuli of the environment. A subset of these stimuli might include the neuroelectromagnetic correlates of the brain activity of others. We suggest that receptive psi phenomena involve the detection of these stimuli.

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These phenomena would be the neural analogue of the interaction between distal but identically constructed Tesla coils.

The types of information primarily involved with receptive psi phenomena, however, would be strongly determined by the class of neuroelectromagnetic patterns shared by all or most human beings. Those individuals with greatest similarity in neuroelectrical and neurocognitive structure, such as relatives, would display the greatest capacity for detecting interpersonal changes. The geomagnetic field, within which we are all immersed, would be the common medium modulating these interactions.

In a previous experiment (Persinger, Roll, Tiller, Koren, St-Pierre, & Cook, 2002) with a special subject, Ingo Swann, we found that exposure to circumcerebral magnetic fields may have enhanced his accuracy for remote viewing. It is defined operationally as the experience of information at a distance by mechanisms not known to date. The following experiment was designed to discern whether this replicable, experimental treatment by circumcerebral magnetic fields purposely designed to affect the neural correlates of consciousness could increase the ability of people to discern any objectively identifiable characteristics of the reconstruction (reminiscences) of memories in others. Specific neural correlates of memory-related mechanisms have been suggested (Roll, 1966; Persinger, 2002) as more related than is perception to phenomena presently labeled as receptive psi experiences.

Method

Subjects

Nine pairs of volunteers served as subjects. The relationships and numbers for each pair were mother-daughter (5 pairs), brother-sister (1 pair), identical twins (1 pair), spouses (2 pairs). Their ages ranged from 20 to 40 years.

Procedure

On nine separate days over a 4-wk. period, the pairs of subjects were tested singly. The response person, exposed to our experimental magnetic fields, sat in a comfortable chair within an experimental room with the second author. The other individual, the stimulus person, sat in a second room with the third author. The experient or response person (the one exposed to the fields) was always female and the younger of the pairs. We selected this arrangement to stimulate the characteristics of "spontaneous cases" of receptive psi reports (Persinger, 1974).

The field-exposed person sat facing a southeasterly direction. According to a MEDA FM 300 vector magnetometer, the following geomagnetic values which defined the space in which the person sat were resultant 46,300 nT, $X = -6{,}750$ nT, $Y = -7{,}300$ nT, $Z = 45{,}280$ nT, declination $= -135°$ and incli-

nation 71.2°. The stimulus person sat facing the south. The geomagnetic values within this space were comparable.

An eight-solenoid device (Cook, *et al.*, 1999) was placed around the field-exposed person's head such that the plane was above the ears. She was blindfolded and instructed to state any image, idea, or hunch that was experienced. All statements were hand written by the experimenter. The application of the fields involved six successive configurations (Table 1), each presented for 5 min. Between each field presentation there was a 1.5-min. period of no field during which the second author initiated the next configuration. The fields were presented in the horizontal plane in a counterclockwise (from the top) direction.

TABLE 1
TEMPORAL PARAMETERS (IN MSEC.) OF VARIABLES INVOLVED WITH SIX SEPARATE CIRCUMCEREBRAL MAGNETIC FIELD CONFIGURATIONS

Parameter	Configuration					
	1	2	3	4	5	6
	Casual Conversation Burst-pattern Phase			Stimulus and Memories Frequency Modulated Phase		
	1	2	3	1	2	3
Pixel duration	1	1	3	1	1	3
Interstimulus interval	1	1	3000	1	1	3000
Commutator rate	20	100	200	20	100	200
Change in rate of commutator	+2	+20	−2	+2	+20	−2

During the first part of the experiment, the field-exposed person was exposed to the burst-firing pattern in three different phases described by Cook, *et al.* (1999). The subjects were not aware of the patterns of these fields or their order of presentation. During this time the stimulus person and an experimenter engaged in casual conversation. The selection of the burst-firing patterns first and then the frequency-modulated pattern was derived from observations that the reversed presentation of this sequence did not generate the types of experiences reported in this study.

About 2 min. before the beginning of the stimulus phase of the experiment, the second author knocked gently on the door of the room in which the third author and the stimulus person were sitting. The stimulus person was instructed by the third author to look at one of five color picture postcards and to think of the response person and to write down (1) what the response person would think of the scene and (2) the experiences that the response and stimulus persons shared regarding the thoughts produced by the picture.

The postcards were contained in manilla envelopes at all times except during the experiment. Only one envelope was randomly selected from the

pile, and only its contents were presented to the stimulus person. The topics of the postcards were a canoe near small cabins of a campground, a waterfall in northern Ontario, an autumn scene of large trees with yellow leaves along a road, the giant stack of a major mining company, a colourful full-sized train (once used for ore transport and now on display for tourists), and a picture of a central building in the city of Sudbury.

This active involvement and engagement of emotional associations and memories in response to a stimulus viewed directly by a person was selected as the procedure in light of a similar technique developed by Ullman and Krippner with Vaughn (1973). They found the content and theme of the dreams of an individual were similar to the content and theme of a randomly selected painting being viewed simultaneously by another person if rapid eye movement or dreaming was occurring at the time of the observations.

This procedure was also consistent with our theoretical approach that these "paranormal" experiences involve primarily right hemispheric processes, across regions or activities within the brain required for spatial relationships and their affective dimensions and directly affect the memory process itself. Recent experiments with rats which indicate the "replay" of patterns induced by stimuli impinging during the waking state within hippocampal ensembles during rapid eye-movement sleep (Louie & Wilson, 2001) can be interpreted as supporting this approach. In addition, specific enhancement of power within the right hemisphere within the theta band by the configurations employed in the present study (Richards, *et al.*, 2002) suggests a physical effect that might simulate components of these altered states of consciousness.

During the period when the stimulus person was generating memories about the field-exposed person, about 20 min. in duration, the field-exposed person received the circumcerebral fields. The temporal parameters were identical in each of the first three sequences (Configurations 1, 2, and 3) except instead of the burst pattern a frequency-modulated (Thomas) pattern was employed. It was selected because in other experiments, involving transcerebral magnetic fields applied across (not around) the two hemispheres, sensed presences were more easily evoked (Persinger, Tiller, & Koren, 2000; Cook & Persinger, 2001). All testing was completed between 19 hr. and 22 hr. local time.

Two of the nine field-exposed subjects did not report any substantial images and did not speak more than a few words during the study. Because this study was based upon narrative details and comparisons of narrative details, these two pairs were excluded from the study because there were no data to analyze. The comments of the remaining seven pairs were typed. Few comments occurred during Part 1 of the study when the burst pattern was presented. Most of the reported visual images occurred during Part 2 of

the study. Consequently, only the narratives from the latter phase were employed for the comparative analyses. An image was defined as any statement in which the response person employed some variant of the verb "see", such as "I see her in a meadow" or "I see the ice on the lake".

In addition, the numbers of distinct ideas, defined as phrases containing a central noun or action, were counted for the narratives displayed during each of the six configurations for separate consideration. We have employed this technique in previous experiments concerning memories of 5-min. narratives (Michaud & Persinger, 1985; Healey & Persinger, 2001). The procedure is also similar to that employed for scoring the Wechsler Memory Scale and other clinical tests for narrative memory.

The typed narratives of the response (field-exposed) persons, numbered 1 to 7 and the typed writing of the stimulus persons, designated "a" through "g", were given to 21 first-year students enrolled in a psychology course. Another 23 students from the same class received the transcripts of the stimulus-persons, numbered 1 to 7, and the comments of the field-exposed (response) persons, designated "a" through "g". The only data removed from the narratives were personal names.

The students, who served as the raters, were told this study involved "communication of emotions and images between pairs of people". The students were asked to read narrative 1 first and then to select the paragraph from letters, a through g, that was most similar. When the choice was complete, they were instructed to read the next narrative and select one of the paragraphs, etc. until all 7 pairings had been completed.

The proportion of agreements for the paragraph of the actual stimulus person and field-exposed person was calculated for each pair of subjects. Because geomagnetic activity has been shown to be consistently associated with both the occurrence and the accuracy of these experiences within both spontaneous (Persinger, 1993) and experimental settings (Persinger & Krippner, 1989; Berger & Persinger, 1991; Krippner & Persinger, 1996), we obtained 24-hr. aa (average antipodal index) values for global geomagnetic activity for the day of and for each of the three days before and the three days after each of the seven pairs were tested (Geomagnetic Induces Bulletin; National Geophysical Data Center, 325 Broadway, Boulder, CO 80303).

This measure, in nanoTesla, reflects the averaged activity from several stations over the hearth. In addition, we obtained the 3-hr. Kp (planetary) indices, quasi-log measurements of disturbances within the geomagnetic field, to examine more closely the potential influence of these perturbations upon the accuracy of the experiences. Values for the three, successive 3-hr. intervals before and after the interval in which the experiment occurred were extracted.

Post hoc comparisons were completed by two examiners (not related to

the experimenters) who compared the pairs of comments and narratives and identified when they occurred within the six field conditions. A value of either 0 or 1 for each of these six patterns was established for each person to minimize the effects from outliers. In addition the total numbers of direct ideas between the pairs exposed to the field and to the stimulus were summed. Although we appreciated that knowing the identity of the field-exposed and stimulus persons could affect decisions of congruence due to *a priori* perceptual assumptions, we were interested in the size of any effect that might emerge. All analyses employed SPSS software on a VAX 4000 computer.

Results

Three conspicuous results emerged from this experiment. First, according to a two-way analysis of variance with two levels repeated (pattern: burst vs frequency-modulated and temporal structure of the circumcerebral fields) the field-exposed subjects reported significantly more visual images when they were exposed to the frequency-modulated patterns ($F_{2,12}=31.87$, $p<.01$; η^2) at the time the stimulus person was generating memories from a randomly selected postcard compared to the burst-firing pattern. The criterion for an "image" was any statement indicating the response person was "seeing" a person, place, or thing. The means and standard deviations for the numbers of images reported during the burst-firing and frequency-modulated pattern were 3.8 and 2.5, and 6.4 and 2.4, respectively.

Secondly, there was a qualitative difference between the experiences reported during the presentation of the burst-pattern and the frequency-modulated pattern. The former was associated with singular, perceptual experiences such as colors, vibrations, or floating sensations. The latter was dominated by specific imagery and more intense, highly detailed phenomenology.

Third, a two-way analysis of variance for the occurrence of a direct congruence between the comments of the stimulus person and the field-exposed person for the six patterns indicated they were more frequent during the frequency-modulated pulses ($F_{1,6}=9.35$, $p<.05$; $\eta^2=61\%$) compared to the burst-patterns. The means and standard deviations for the proportion of congruences were 62 (30%) and 19 (26%), respectively. However, when the total numbers of ideas per pattern was first accommodated by analyses of covariance the difference between the two conditions was no longer significant statistically ($t=1.95$, $p>.05$).

The mean and standard deviation for the proportion of raters who paired the comments of the stimulus person with the narrative of the appropriate field-exposed person was 40% and 25%, respectively (range 12% to 80%). The proportion of chance pairings for the seven cases was 14%. There was no significant ($t=1.41$) difference between the students who ref-

erenced the accuracy relative to the field-exposed subject's statements ($M=35$, $SD=25$) or the stimulus person's statements ($M=45$, $SD=25$). Consequently, the ratings of the two groups were combined.

Two examples of narratives and comments judged to be congruent by the greatest proportion of students are shown in Table 2. An example of a pair of statements that showed the least congruence, according to the raters, is shown in Table 3. The means and standard deviations for the aa values for the three days before, the day of, and the three days after the experiments were 11 (*SD*: 5), 21 (*SD*: 14), 22 (*SD*: 22), 19 (*SD*: 9), 21 (*SD*: 8), 27 (*SD*: 17), and 26 (*SD*: 17), respectively. The values of Spearman *rho* between the global geomagnetic activity during each of the three days before, the day of, and each of the three days after the experiments and the proportion of raters who accurately paired the stimulus subjects' comments and field-exposed subjects' narratives were −.44, −.01, .16, −.16, −.72 ($p<.05$), −.81 ($p<.05$), and −.87 ($p<.05$).

TABLE 2

COMMENTS FROM TWO PAIRS OF FIELD-EXPOSED/STIMULUS PERSON PAIRS RANKED AS CONGRUENT BY GREATEST PROPORTION OF STUDENTS

A. *Stimulus Person's Comments*: Stimulus: Canoe. The picture is calm, alive, peaceful . . fresh air . . happy . . small part of the world . . . relaxed . . . makes me wish I could paint . . . I love the colours of autumn . . . see . . X . . fishing, camping. X excited . . . beautiful . . . X is very happy catching fish, good . . . happy.

A. *Field Exposed Person's Narrative*: Can't feel my head, numb feeling, arms are numb . . . nose feels numb . . . thinking of movie "Fly Away Home" . . . thinking of birds flying . . squirrels . . getting water imagery . . . like boats and fish . . . like I'm underwater and going up towards the light, swimming with fish . . . see waves.

B. *Stimulus Person's Comments*: (Stimulus: country road during autumn) Reminds me of place where T. last worked (restaurant near an old church) . . place where I would like to take my horse on a hack. Autumn is not my favourite time of year for I know the snow is not far away. I do enjoy the change in colours. I did not have this as a child for I lived in another country. T. would like the colors . . . she may like to take pictures with her camera. I like the quiet country road even riding my bicycle or running.

B. *Field-exposed Person's Narrative*: I see an empty church . . . see restaurant . . . my parents having dinner. There is a laboratory filled with animals . . . old house I lived in . . . black storm in sky, thunder, lightning . . . snakes. I see her (agent's) horse . . . sunset . . . pond in backyard . . . mom planting flowers . . . dad at computer . . . my brother . . . my two dogs . . . dog and mom beside each other.

For the 3-hr. planetary Kp indices of geomagnetic activity that ranged between 0 and 5 during the 9-hr. period before and after the experiments, the only statistically significant correlation between the congruence of the ratings and this inference of geomagnetic activity occurred for the 3-hr. interval corresponding to 0 to 3 hr. Universal Time or 8:00 P.M. to 11:00 P.M. local time, the intervals when most of these experiments were conducted. The Spearman *rho* was .77 ($p<.02$). The *rho* values for the three 3-hr. periods before this interval and the three 3-hr. periods after this interval ranged between .27 and .11.

TABLE 3

COMMENTS FROM PAIR OF FIELD-EXPOSED PERSON AND STIMULUS PERSON PAIRS RANKED AS LEAST CONGRUENT BY STUDENT RATERS

Stimulus Person's Comments: Stimulus: brightly coloured full-sized train on display. R is excited because she is in the picture and getting attention. R would think of Allan because he worked for the railroad. The train would make her think of Disney World—of the ride in the train she took there, and there would be good feeling. Nice sunny day . . also some pride because it is from Sudbury. She would wonder why there's a picture of a girl there . . what does it represent? The picture might bring her sadness because having the picture means that it is dedicated to that girl, therefore something bad has happened to her.

Field-exposed Person's Narrative: I think of drowning . . . I have a fear of suffocation . . . but I love swimming anyway . . . I see the field in my backyard with ice . . . see lots of shadows . . . see lots of dying plants. thinking of the wind . . . like the Rocky Mountains, quiet . . . I'm picturing my hands . . . just thought of an aneurysm . . . don't know why . . . a cigarette . . . chapstick . . . thinking of Z. Z. (a girl who died) . . . it feels like time is very long right now . . . can't picture what the room looks like anymore . . its fuzzy . . . (laughs loudly) . . . I just imagined myself sleeping.

Although only seven cases that contained sufficient detail were involved in our analyses, we reasoned that exploratory factor analyses might be revealing. The PA1 method for the proportion of students who accurately paired the narratives for the stimulus and response persons, the total number of direct ideas decided by two raters familiar with the identities of the pairs of subjects and the sum of the numbers of field patterns that contained at least one direct idea yielded two factors. After varimax rotation, the first factor (eigenvalue = 1.51) was loaded by the first two variables (.89, .79), while the second factor (eigenvalue = 1.04) was loaded (.96) exclusively by the last variable. Whereas only the Kp indices between 21 hr. and 24 hr. UT (5:00 p.m. to 8:00 P.M. local time) were correlated significantly (.85) with the second factor, the values for the next interval (8:00 P.M. to midnight, the time of the experiments) was correlated significantly (.74) with the first.

An additional factor analysis for the sum of the numbers of field patterns that contained at least one direct idea showed three factors. The first, and most powerful (eigenvalue = 3.17) was loaded by the field (.90) and second (.77) phases of the frequency-modulated pattern and the third phase (.91) of the burst pattern. The only statistically significant correlation (*rho* = .68) occurred between this factor and the geomagnetic activity during the same 3-hr. period as the experiment; correlations for 3-hr. intervals before and after this period were not significant (*rhos* were between –.23 and .34). The correlations between this factor and the global 24-hr. aa values for the day before, the day of, and the day after the experiment were –.38, .40, and –.31, respectively.

DISCUSSION

Human experience is the consequence of extraction and refinement of electromagnetic patterns generated within large arrays of neurons. The infor-

mation within these patterns has been assumed to begin with the transformation of discrete classes of energy, such as electromagnetic radiation with wavelengths between 400 and 800 nm wavelength or mechanical variations between 20 Hz and 20000 Hz within the air, into neuroelectromagnetic equivalents. These equivalents converge with other afferent patterns, are organized within several increasingly complex centers through the brain stem, and evoke linguistic-associated images.

If the processes that generate human consciousness are influenced by discrete recursive temporal binding factors as predicted by Edelman (1989) and observed by Llinas and Pare (1991), then subtle, even statistical, quantal alterations in these temporal parameters and their associated energies (Jibu & Yasue, 1995) might allow other information to access brain processing and to enter into consciousness. The results of this study suggest that application of a specific pattern of circumcerebral fields increased the proportion of images congruent with the memories evoked by a picture viewed by another person who knew the person being exposed to the magnetic fields.

The strength of the effect was greatest with a pattern whose velocity around the head shifted at a rate of change of 20 msec. Since neither the stimulus person nor the field-exposed subjects knew the parameters of the field or when they were to be presented, the possibility that the enhanced accuracy during this specific 5-min. period would have occurred by incidental congruence of shared or planned factors is minimal. This specificity also reduces the likelihood that the effect was due to general changes from the simple application of changing fields.

There was a strong negative correlation between the numbers of similarities (as defined by the proportion of student raters who accurately paired the appropriate narratives under blind conditions) between the narratives of the field-exposed people and the comments of the stimulus persons in this study and global geomagnetic activity. Negative correlations between global geomagnetic activity between the congruence of details experienced during dreams and the contents of the paintings viewed by another person at some distance while the individual was dreaming in the laboratory have also been reported (Ullman, *et al.*, 1973). Several correlational studies have shown that days in which reports of psi experiences occur, usually during sleeping or altered states of consciousness, exhibit quieter geomagnetic activity than the days before or after the experiences (Persinger, 1993).

We (Persinger & Lafreniere, 1977) have suggested the six billion brains that compose the human species are all immersed within the steady-state geomagnetic field. Species-relevant biological information is mediated through this immersion and is represented as functional patterns within the arrays of cells within the limbic system concerned with spatial position and time (Louie & Wilson, 2001). According to this hypothesis, enhanced geomag-

netic activity suppresses nocturnal melatonin activity, facilitates paroxysmal electrical activity within the hippocampal formation, and interferes with this representation if the stimuli are present (Michon & Persinger, 1997).

On the other hand, a sudden decrease in global geomagnetic activity may dampen the normal neuroelectrical noise within the limbic structures and facilitate detection and representation. Individuals with propensities for neuroelectrical lability within the temporal lobes, such as the creative population of writers, painters, and musicians, would be more likely to discern this information when the periodicities in their cyclothymia and geomagnetic perturbations are synchronized. This hypothesis is a variant of the signal/noise ratio models employed in traditional psychophysics.

However, we also observed a strong positive correlation between the congruence of the narratives for the pairs of field-exposed and stimulus persons and geomagnetic activity during the 3-hr. interval corresponding to the time of the experiments. This was a strong, specific effect, not previously observed in these types of studies. The range of the Kp values between 1 and 4 correspond to relatively weak geomagnetic perturbations. These results suggest that an interaction between the experimentally generated circumcerebral fields at the time of mild geomagnetic activity allowed greater responsivity to whatever cerebral and environmental stimuli are associated with the stimulus person's memories and writings.

This apparent contradiction between the positive correlations between ambient geomagnetic activity and proportion of congruence between narratives and comments during exposure to circumcerebral magnetic fields and the frequent negative correlations associated with traditional receptive psi experiences might be accommodated if we assume that consciousness is an insulator to the totality of stimuli within the environment. During dreaming and the waking state the cohesive transcerebral waves correlated with consciousness are recreated every approximately 20 msec. and are phase shifted along the rostral-caudal axis (Llinas & Pare, 1991). One interesting question is what happens between the termination of one quanta or phase of these cohesive cerebral fields and the beginning of the next wave.

We suggest that during these very narrow "infinitesimal" periods information, typically excluded during normal transformations by sensory and perceptual processes, is represented within the brain and becomes incorporated into conscious awareness. Low geomagnetic activity, particularly below 20 nT, would be associated with processes that are impedance-matched for representing this information. Information during the higher intensity geomagnetic variations would exceed the range to be represented within these "infinitesimal" periods unless the signal strength was extremely high or the signal was prolonged, such as biological events of death or crisis.

During exposure to circumcerebral magnetic fields, however, the timing

of these cohesive cerebral fields might be modified such that the "width" or duration would be expanded. This would change the "impedance matching" such that information associated with stronger magnetic fields might be represented. Were this correct, then stronger geomagnetic activity might facilitate the incorporation of information that is less biologically catastrophic, such as the electromagnetic equivalents associated with shared memories.

Recent measurements by Richards, *et al.* (2002) have shown that counterclockwise, circumcerebral application of the same fields as those employed in this study produced an increase in power of activity within the theta band over the right hemisphere compared to the left. In addition, the same configuration (with 20-msec. rates of change) that was associated with subjective time distortion was specifically associated with increased power within the theta band throughout the whole brain. These results suggest that specific fields directly affect the whole brain, especially within the theta and low alpha bands, two intervals traditionally associated with altered states and the experience of distal information.

If we assume that the human brain is arranged similarly to that of the nonhuman primate, then specific cells within the parahippocampal formation of all normal brains would respond to various stimulus configurations and shapes. The issues of individual differences in the coding and representation of experiences, which would decrease the required homogeneity of functions between individuals, would be less critical. The remaining challenge would be the mechanism or process by which the information is shared. We suspect that the metaphor of "transmission" is less accurate than a metaphor involved with expansion of temporal and spatial windows (Persinger, 1999).

Alternatively, the positive correlation between geomagnetic activity during the precise period of the experiences and the proportion of concordance may reflect some nuance of limited range. Even the narratives ranked by the first year students as least congruent (see Table 3) contained information that might be considered as affectively relevant. For example, reference to death, aneurysm, and suffocation by the field-exposed person was markedly congruent with the memories of the stimulus person when she looked at the picture of a train.

We designed the experiment such that the process would emphasize the "memories" of the stimulus person evoked by a randomly selected picture. This emphasis upon ongoing memory processes and hippocampal activity was derived from the hypothesis of Roll (1966), the responsiveness of special individuals who engage in this behavior frequently to hippocampal-relevant weak magnetic fields (Cook & Persinger, 1997), and the relationship between geomagnetic activity and "images" attributed to memories during exposure to transcerebral weak magnetic fields (Persinger, 2002).

The limit, however, to ascribing validity to such congruence between the narratives and comments to direct association between two people is that a third factor may have evoked both experiences. We also cannot discern on the bases of these results the "causal direction" of the experiences. Careful examination of the timing of the statements indicates we cannot conclude whether the "memories" of the stimulus person were "affecting the experiences" of the field-exposed person or if the experiences of the field-exposed person were affecting the "reminiscences" evoked by the stimulus postcard even if it had been drawn randomly.

We have assumed that paranormal experiences are natural phenomena, well within the scope of scientific examination, that occur when combinations of variables are temporally but transiently contiguous. Like any natural phenomena these phenomena should be reproducible within the laboratory once the natural conditions are simulated or imitated. Without understanding the variables required for their occurrences, these phenomena will remain as obscure and as questionable as the occurrence of solar eclipses before the understanding of Keplerian orbits. If the paranormal experiences involving experiences of others involve access to stimuli typically masked by the neuroelectromagnetic activity associated with normal consciousness, then experimental procedures which alter this pattern should allow the experimental reproduction and control of these phenomena.

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