Gathering of Global Mind*

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Someday after mastering winds, waves, tides and gravity, we shall harness the energies of love, and then, for the second time in the history of the world, man will discover fire.

Teilhard de Chardin (1959)

Abstract

The Global Consciousness Project is an international collaboration of researchers studying interactions of consciousness with the environment. We maintain a network of detectors located around the world in over 50 host sites ranging from Alaska to New Zealand. These devices generate random data continuously and send it for archiving to a dedicated server in Princeton, New Jersey. The data are analyzed to determine whether the unpredictable sequence of random values contains periods of detectable structure that may be correlated with deeply engrossing or meaningful global events. This paper describes the scientific lineage of the project and provides a background for interpreting the data, which contain significant departures from expectation suggestive of something like our hypothesized global consciousness, or of equally remarkable "observer" effects. According to standard physical theory, there should be no structure at all in random data. Yet, we find that many of the identified cases exhibit striking patterns. Special times like the celebrations of New Years, and tragic events like the attacks on September 11, 2001, show substantial changes that are correlated with shared periods of deep engagement or widespread emotional reactions. Our analyses establish that the non-random behavior cannot be attributed to mundane sources such as electrical grid stresses or ordinary electromagnetic fields. The evidence suggests instead that the anomalous structure we see is somehow related to the unusually coherent focus of human attention generated by extraordinary events.

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The Project

When we join in shared thoughts and emotions, do we create something new in the world? A large, international collaboration has been in place for several years to look at this question. Simply put, we are trying to capture faint glimmerings of a possible global consciousness. This is one way, necessarily metaphoric at this point, to describe an ongoing, long-term scientific project that has been gathering data that seem to allow some extraordinary claims about the role of mind in the world. The project has a respectable lineage, and a mandate to do the work in such a way as to collect evidence that is both unimpeachable and instructive about anomalous behavior recorded by our instruments. We hope ultimately to be able to say whether human consciousness in some form is the source or a major contributor to the effects, but I believe there already are clear indications that we are asking a good question, and have a chance of learning something of value. Maybe there isn't anything there, but maybe there is, and if so, we ought to know about it. This paper is an introduction to the Global Consciousness Project (GCP) and my intention is to describe very generally where it comes from and why we are doing things in a particular way.

At the developing boundaries of modern science there are people who think the mind is not just an emergent manifestation of brain cells, but more comprehensive and inclusive, so much so that it can have an active, creative role in the physical world. This refers to subtle qualities, not just the implementation of ideas by talking or building or playing music. The notion is that mind might directly affect the way things go. Consider that your mind is your most personal level of being; it is who you are, it defines the world you inhabit, and it channels all the connections that link you to your environment and to other people. We are social creatures, with interactions at many levels, ranging from physical to ethereal, from body to mind. At the rarified end of this spectrum, your mind may resonate with another person's directly, so that you share feelings without words. That sharing, or empathy, changes your world slightly but in potentially important ways. It is directly experienced, but it is in the realm of mind, and it isn't something science is well prepared to measure, even though it is important in our lives. The resonance and interconnection of minds apparently does create something new, just as love seems to create a new being out of what had been separated individuals. The idea extends easily to an interaction of mind with the rest of the world, with flowers and rocks and cars and computers, in which a resonant exchange might create small differences. The flower might grow more healthy, the car might start more easily. Perhaps not, but we should not assume this because our textbooks fail to treat such capacities of mind. With the methods of science, and the ability to investigate ever more subtle aspects of the world, it has become feasible to ask questions that touch upon empathy and interconnections, and examine the intuitions we have about the potentials of mind and intentions, wishing and prayer.

Starting 30 or 40 years ago, good experiments began to be developed with simple measures of correlation between what you have in mind and what happens to sensitive equipment in your presence. The most widely used experiment of this sort begins with a source of random numbers, for example, an electronic device that generates unpredictable positive and negative pulses which are recorded and counted at high speed using a computer. The result is like a sequence of coin-flips, and the speed and accuracy of electronic counting enables rigorous experiments where people try, for example, just by wishing, to get more heads or more tails. The experiments show a tiny correlational effect on truly random event generators (REGs), even though the laboratory setting and task are pretty abstract (Radin & Nelson, 1989; Jahn et al., 1997). Among the most startling

aspects of the effects is reasonably good evidence that they aren't much influenced by spatial or temporal separations. The science remains controversial (Broughton, 1991), but scientists with direct experience in the research find that the evidence is persuasive (Utts, 1991). No generally accepted explanations have been found, but one of the favored notions is that information in a participant's mind, such as an intention, somehow is available to and integrated by the experimental system. It is as if being included in the experiment makes the equipment capable of absorbing or using meaningful information to define its participation in a larger whole.

Moving out of the lab to natural situations, a few of us began to ask a more general question about the possibility that there might be some sort of "field" that could affect an REG. Maybe the mind could be the source of an information field which might act as an organizing influence that could change the character of random data to be slightly less random. (It should be obvious that I am speculating here, but we will go on to look at some of the evidence on which the guesses are based.) Special conditions might be required, something like the resonance that sets the octave piano string vibrating when it is well tuned. Groups of people doing things together sometimes have this dynamic, a coherent attention and engagement that sets everybody into a tuned resonance. This is a commonly felt experience, though it is noted mainly in retrospect. The group becomes an entity in its own right, and assumes a kind of group consciousness – which, of course, is quite unconscious of itself. The group mind is busy with the task at hand; it cannot be examining its own structure or how it came to be.

But maybe there is a way to look at it after all. Could the same technology that found correlations of mind and objective information in the laboratory also capture some manifestation of a group consciousness? The possibility that resonance between humans and machines might be instrumental in the generation of the unexpected correlations needs only a little expansion to suggest that a group resonance might also create structure in an otherwise random system, one of our REGs. We began testing this notion in "FieldREG" experiments, taking a portable system into the field, to rituals and ceremonies, small groups and conferences, sacred places and shopping malls. What we found was that the REG data did show structure in some of these situations, and most of the time it was where people were deeply engaged, where they became a group with a common focus (Nelson, et al., 1996; Nelson, et al., 1998a).

How do we jump from the lab results and these field trials with local groups to testing for signs of a "global consciousness"? Why should there be any effect of a world-wide New Years celebration, or the beginning of a war, or a billion people watching a funeral ceremony, on such REG devices located around the world? Although it must be recognized as a metaphor, it may be helpful to envision a "consciousness field". Picture a faint radiance of information extending out indefinitely from each mind, with a wavelike interpenetration creating tenuous interference patterns that differ depending on our intentions and our degree of engagement. Again, we are speaking of a metaphor, not an actual physical energy that we can directly measure, but something like a field carrying information, which may be responsible for the anomalous effects in these "field" studies with REGs.

Development

The first explorations of FieldREG measurements were at meetings of friends and colleagues interested in exactly these questions of consciousness and its manifestations in the world. During an invited conference at Esalen in December 1993, with a group developing research strategies to look at distant healing and mental interactions with living systems, participants' feelings of resonance were matched by strong departures of the data from the normal expectations for random sequences. A laptop computer with an REG attached was set to run continuously while we talked and argued the issues, and later, when the stream of data was broken into segments corresponding to specially coherent parts of the meeting, we could see a correlation that would happen by chance only once in a hundred repetitions of such an experiment. Similar results in other situations involving deep engagement, such as rituals and musical performances, showed that coherence and resonance in groups could be correlated with departures from randomness. Soon, there were several people doing related research, and cooperating by taking data for a particular event with REGs in several locations in the US and Europe. For example, we arranged a collaboration to see whether there might be an effect of the intense interest in the O. J. Simpson verdict in October 1995 (Radin, 1997). There was, and the combined result from five detectors showed a peak of relative order in the data at the time the verdict was read, with apparent odds against chance of several hundred to one. Seven people collected data from 14 REGs during the "Gaiamind" meditation organized in January 1997, a prototype for the larger and more systematic project to come (Nelson, 1997). The results were unlikely at 20 to 1 odds to be mere chance deviations. In September 1997, the funeral ceremonies of Princess Diana were a natural focus that generated a profound emotional resonance among very large numbers of people. We took data on 12 machines in Europe and the US, and the results showed an increased order with 100 to 1 odds against chance (Nelson, et al., 1998b). These correlations and measures involve subtleties that we only begin to recognize, however. Just one week after the Diana ceremonies, we recorded data during the apparently similar event of the funeral procession and ceremonies for Mother Teresa (Nelson, et al., 1998b). This time the data, taken in the same way by the same network of REG researchers, showed no deviation at all. Of course the difference might be because Diana's death was tragic, and Mother Teresa's an expected transition. But the example shows how much we have to learn about the meaning of the correlations, and the factors that may govern them.

By now the stage was set for creating a powerful set of tools for asking about consciousness effects in the world on a grand scale. Teilhard de Chardin wrote more than 40 years ago about a possible future for man in a global consciousness (Teilhard, 1959). The idea was that the earth might eventually have another layer to join the crust of mountains and oceans, and the atmosphere of air. The next evolutionary stage for life would be a layer of intelligence or mind, which Teilhard chose to call a "noosphere". Some writers see such a coordinated system of intelligent interaction developing in our rapidly growing communication technology and the Internet (Russell, 1983; Cobb, 1998). The web is certainly a vehicle of great power carrying us toward a world society, but it probably is not yet manifesting Teilhard's vision, even though there may be metaphoric similarities. What is more salient for our purposes, the web is one of the necessary technical elements of a project to see whether there may be subtle but detectable evidence for the noosphere.

In November 1997, at a conference on psychophysiology and psi, the idea for a world-spanning network of REG devices came into full bloom. The conference context made it natural to think of

the global equivalent to an electroencephalogram, or EEG, used to capture brain activity and thereby indications of human consciousness. The scale would be different, and instead of fluctuating electrical voltages, the measure would be of fluctuations in information, changes in randomicity, but the REG network could be thought of a "World EEG". Of course the world is not a brain, with left and right hemispheres and speech centers, etc. But the metaphor is valuable for quite practical reasons, such as the potential applicability of analytical and interpretive strategies. I wrote a plan for the project and talked with friends and colleagues who had the necessary skills and interest in making it happen, and soon we were building the hardware and software for an "electrogaiagram", or "EGG" for the earth, with a wink at the model EEG on the human scale.

Design

The EGG project, which in the meantime acquired its more transparent public name, the Global Consciousness Project, is simple in concept, but technologically sophisticated. Indeed it could not have been built more than a couple of years earlier. At host sites around the world, a hardware REG is connected to a computer that runs an operating system and program capable of recording data continuously in a completely specified format. The stored data are transmitted over the worldwide web to a central server, where they are archived and analyzed. The server also maintains a website where all aspects of the long-term experiment are documented (http://noosphere.princeton.edu). Formal predictions are registered, describing major events that might be correlated with departures from randomness, and the results are calculated and displayed in tables and graphs. There is more to the site, including a large complement of exploratory analyses, and online access to the data so anyone can perform an analysis or check on those we have done. There are real-time displays, and movies with a day's data represented in splashes of color and Cage-like music controlled by the composite of all the random data. There is detailed explanation of all the procedures and protocols, and there is a poetic history that plays back some of the inspirations and motivations for this project, in excerpts and quotations from philosophers and thinkers, friends and regular folks who have thought deeply about the earth and our place in its history – and its future. And there are also many links to references and related materials. The latter include a wide variety of other efforts to look at the Earth and our role as stewards, and toward our potential as Teilhard's noosphere.

For the scientific perspective, of course, the most important part of the story is the results. What happens when there is a big, widely known and deeply engaging event in the world? Is there any sign of a global intelligence or any apparent effect generated by a general coherence of minds? The answer is yes, but it is subtle and complicated. There are viable alternative interpretations of the results, as well, and we are searching for ways to identify the best resolution. Overall there is a highly significant accumulation of evidence that there is something different about the EGG data collected during a global event. On the other hand, the outcome for each experimental prediction clearly depends on a complex of factors we don't understand very well, so there is much to do. This report is about a work in progress. Other sources provide more technical detail (Nelson, 2001; Nelson, 2002; Nelson, et al., 2002; Radin, 2002).

Technology

In the EGG project, data are registered continuously, day and night, month after month, so that there is a history of synchronized readings from all over the globe, corresponding to every moment and naturally covering any momentous occurrence on the world stage. The central archive thus becomes a database of responses that might be registered when a major event stimulates an unusual coherence of thought and emotion anywhere in the world. Friends and colleagues around the world form a network of people with interest in the Global Consciousness Project who are willing to set up a computer to host an egg – one of our REG based detectors. Figure 1 is a picture of the network at the end of 2002.

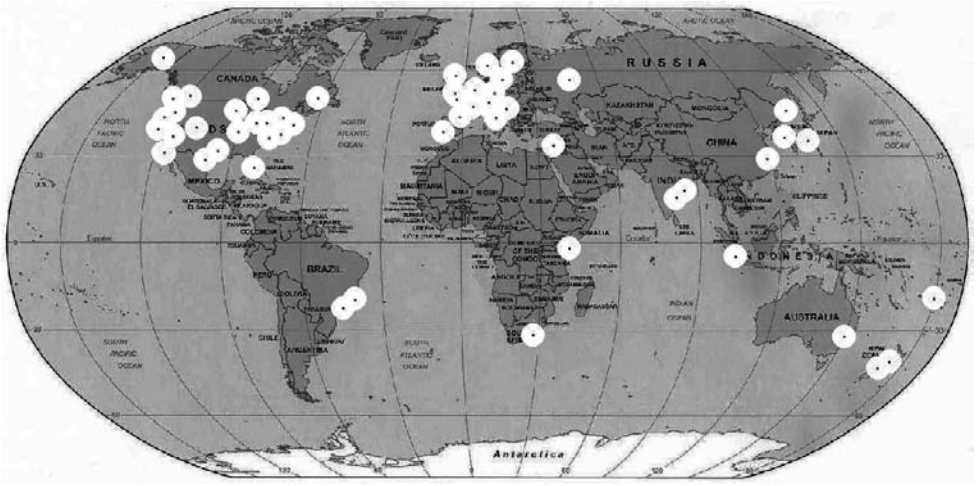

Figure 1. Host sites for GCP eggs ranging from Alaska to Fiji, on all continents.

The network of some 50 eggs runs mostly without intervention, thanks to the sophistication of the program ("eggsh" for Linux or “egg.exe” for Windows) at the host sites and the "basket" program that collects and archives all the data at the main server in Princeton. Even so, the sheer size and complexity of the project means that there is almost always something that needs attention. For example, we run special software that reaches out to "timeserver" computers on the Internet to get the correct time and adjust the local computer clocks so that all the data remain synchronized. This nearly always works, but occasionally an egg will go out of synchrony and will need some correction. Such mis-synchronization will necessarily make any correlations weaker, so the effect on our statistics will be conservative. When the electricity goes off or the Internet connection is down for some reason, the data flow may stop for an egg. All the data are stored on the local computer if it is running, so nothing is lost, but it does take some attention to restore and maintain the flow. To keep watch on such things, there are a number of automated functions that manage the data, construct daily tables and graphs, and allow monitoring of various activities.

Because they are esoteric, it is a little difficult to envision the actual equipment and measures that are at the core of the EGG project. The basic instrument is a physical random event generator, or REG. This is an uncommon device, although its basic function is directly familiar from our experience with various random processes in the world, including such things as flipping coins or watching unpredictable cloud formations. For computer-based data collection, we use REG devices that work with measurements of electronic "white noise" like the random static between

radio stations. The voltage level of this noise, which ranges unpredictably above and below an average level, is turned into 1's and 0's that we can count as if they were heads and tails. Such electronic random sources produce a steady stream of unpredictable binary events, or bits. For the EGG data, we record one "trial" every second, from each REG device in the network. The trial consists of 200 bits and its value is recorded by counting the 1's. We expect that this count will be about 100 because there is a 50/50 chance for a bit to be 1 or 0. Figure 2 shows the noisy trace of a sequence of actual trials from one REG device.

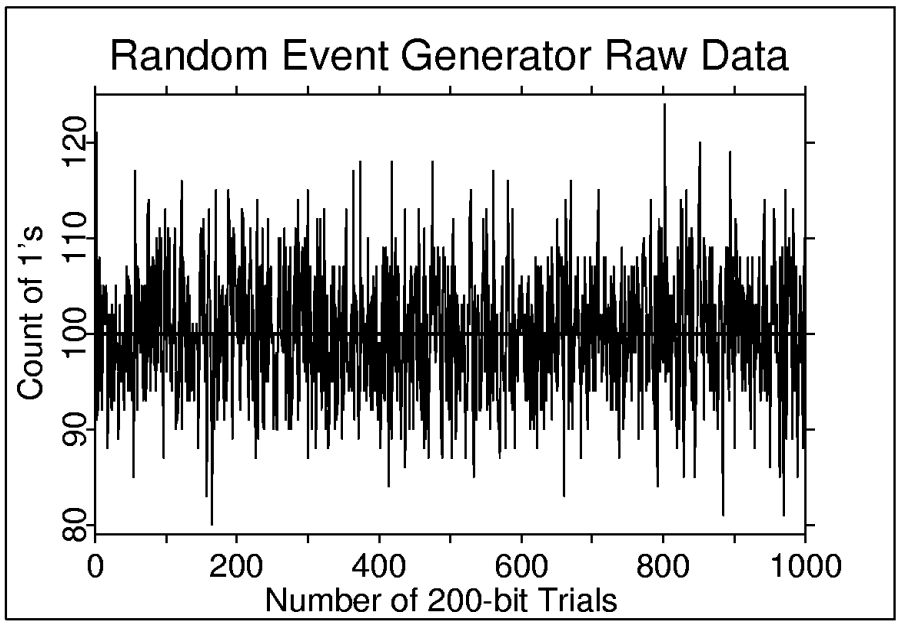

Figure 2: 1000 trials from an electronic REG. The horizontal line at 100 is the expected mean for the 200-bit trials, and the expected standard deviation is 7.071.

The result for each trial at each egg is, in fact, a varying quantity that depends on chance fluctuations, but over a large number of such trials we see a close approximation to the normal distribution, or bell curve. Most of the values are near 100, tapering off to rare scores as far from the mean as 70 or 130. One of the best ways to visualize trends in the data is to graph the deviations of the sequence of trial values from what is expected, and to display the accumulating total deviation. That is, we subtract 100 from whatever the present trial value is, and then just add up the sequence of positive and negative numbers, one step at a time. This produces a random walk (think of a “drunkard’s walk” with unpredictable steps) like that shown in Figure 3, which wanders above and below the expected deviation of zero, but in normal calibration data shows no persistent trend. On the other hand, if there is a consistent change in the data, this figure will show the difference as a trend away from the expected horizontal progression. For the GCP data, which consists of many parallel sequences of random numbers, we calculate a mean trial score across all the eggs for each second. We calculate a normalized "*Z*-score" to represent the mean deviation, and process it a further step by squaring it to produce a "Chi-squared" quantity. The Chi-square has a statistical distribution with the important quality of being additive, meaning that we can easily combine data from different eggs or locations or interesting subsets of events for statistical evaluation. The squaring also eliminates any distinction of positive and negative raw scores, and

represents our hypothesis that there will be consistent departures from expectation without regard for the direction during special moments in time.

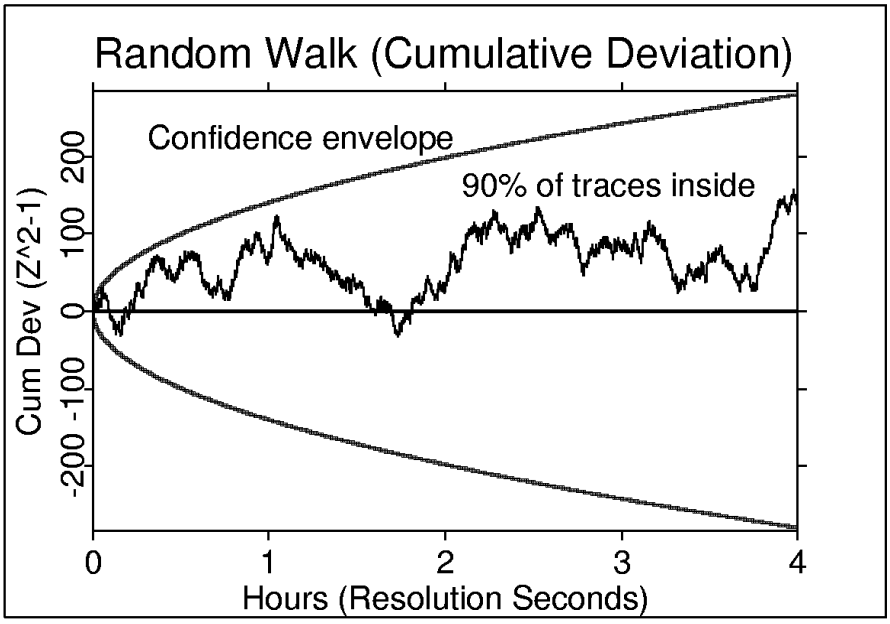

Figure 3: Trial scores are normalized (as *Z*-scores), then squared and plotted as a cumulative deviation from their expectation. The resulting random walk is compared with a smooth curve that shows the 5% significance criterion.

Consistent departures from the expected mean value are easy to see because their cumulative deviation will show as a slope or trend superimposed on the random walk, as we will see in subsequent examples. A consistent increase (or decrease) in the squared *Z*-score will tend to produce many steps in one direction, and even a tiny effect will eventually yield a significant departure, indicating it is not just a chance fluctuation. Thus, to see whether there is a correlation of the data with global events, we examine the scale and the consistency of the trial score variations during those events. Non-random patterns in the data provide support for the hypothesis that engaging events or our reactions to them can affect the REG devices. We interpret significant departures from the expected behavior in the GCP data as a measure of something related to consciousness, following principles derived from four decades of laboratory research showing that human intentions and special states of consciousness can affect the randomness of such devices in controlled experiments.

Picturing Outcomes

Before proceeding to examples of the formal analyses, we will look at a special case drawn from the exploratory work we do to provide context for the formal hypothesis testing. It shows with unusual clarity how graphs of the data can show the correlations we are interested in, and how these rather dry representations of statistics can take on meaning.

Tragedy focuses our minds and emotions. Even when it is expected and inevitable, the death of someone important or close to us is unique, and there are few aspects of life that have so reliable and predictable an effect on our attention and emotions. Mostly we don't think about death, but when it happens in our circle, there is a moment of recognition and participation that is profound. When I got word in May, 2000, that one of my colleagues in the GCP network had died, I felt it would be important to see what the data might tell us. I worried a little over the proprieties, but I knew that Barry Fenn would have laughed at such concerns. Barry was a friend I never met. We had known each other for almost two years. A funny and lively guy, he had discovered the Global Consciousness Project early and wanted to host one of the eggs in Auckland, New Zealand. He brought along two friends, Bryan Roberts, his business partner and the technical wizard whose skills quickly brought the egg online, and Sze Tan, a professor of physics at the University of Auckland, who was host to the second of the GCP's New Zealand eggs.

The traces from the egg connected to Barry Fenn's computer around this time are anything but random, and it is a good bet that is because consciousness, his, his family's, his friends', maybe even mine, from thousands of miles away, somehow touched the data. Here, in Figure 4, is the picture drawn by two "random" devices during Barry's last hours. Number 111, which created the upper trace, is Barry's, running at his office, and the other, number 1024, is at the University of Auckland, hosted by his physicist friend, Sze Tan. The black vertical line marks the time Barry died.

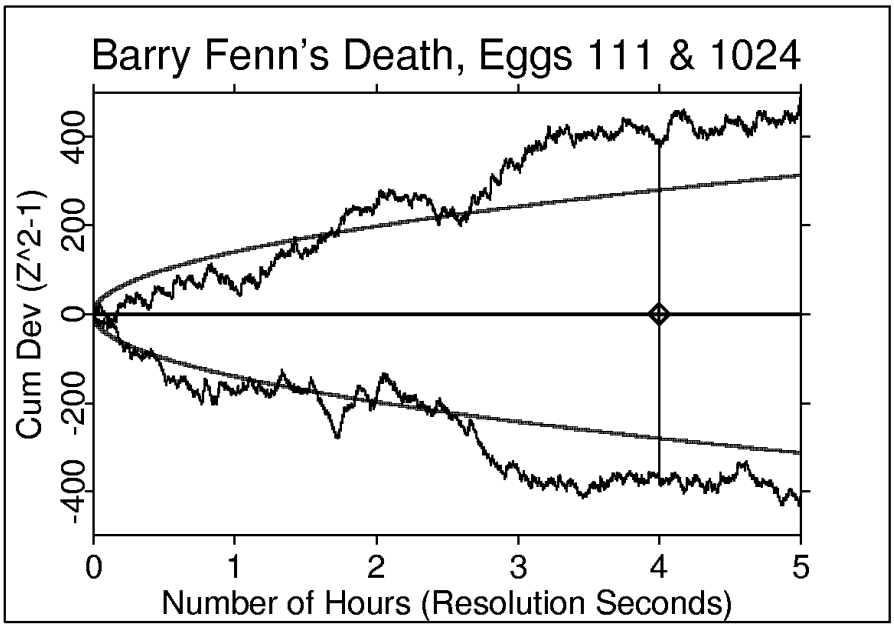

Figure 4: Barry Fenn's last hours, with friends and relatives at the hospital.

Even without knowing anything about the data or the details of the calculations that go into the graph, it is plain that we are not looking at an unstructured, random walk. This is a strong symmetrical pattern, and it has a beauty about it that seems to require that we pay attention. It isn't to say that we have a way of understanding the process of dying, that we suddenly have a source of spiritual wisdom, but it reflects a persuasion that consciousness may have dimensions and

capacities that are truly surprising, at least to people used to having scientific explanations for whatever happens in the world. Of course the world is a bit more complex than science can say, and mystery will be with us for a while.

People often respond to graphs and tables with distress. I hope this example shows that they are actually just pictures that tell part of the story. We need many of them to replace the 10,000 words, and to diminish the abstractions that are a necessary part of scientific discourse. This picture was created by random machines, without any wires or antennae to connect them to Barry or anybody else, and yet, the picture seems full of meaning. We might be able to ignore it or say that after all, if we look long enough we must find an occasional remarkable pattern in random fields, but as we will see, patterns appear in the random data more often than they should, in correlation with meaningful events. Though we have more work to do, the case is strong for these correlations to be material from which we may derive insights into the far-reaching capabilities of consciousness.

Celebrations and Tragedies

We have now a variety of cases that show departures from expectation that make sense if there is a burgeoning global consciousness. (It is important to acknowledge there may be other causes or explanations, such as an effect of the experimenters' strong interest, but we are sure at this point there is no mistake – the data show real anomalies.) To give an idea of the scale and nature of the effects, we will look at a sampling of events that did appear to register detectable structure where there should be none in our data. The first example is a six hour period centered on the beginning of NATO bombing in Kosovo, which was judged by the Western nations and the US in particular to be the only choice available to stop the ethnic war in Yugoslavia (Figure 5). It was a shock to the world, even though it was not unexpected. The GCP data appear to be markedly different before and after the beginning of the bombing, and, during the first hour of bombing, which was the period specified in the formal prediction, the departure from expectation was significant, with a chance probability of 0.045. For the three-hour period leading up to the first explosion, the trace is a classic random walk, with no noticeable trend. Then, beginning abruptly at that time, the trace changes; the next three hours no longer look random. This is, of course, an interpretation of a picture of statistical quantities, and as a single instance, does not answer the question. But it is not alone. It turns out that about two thirds of our formal tests have a positive trend supporting the hypothesis, and some 20 % are statistically significant at the canonical 5% level. These results begin to add up to a persuasive case after all, even though the effects we seek to capture are subtle.

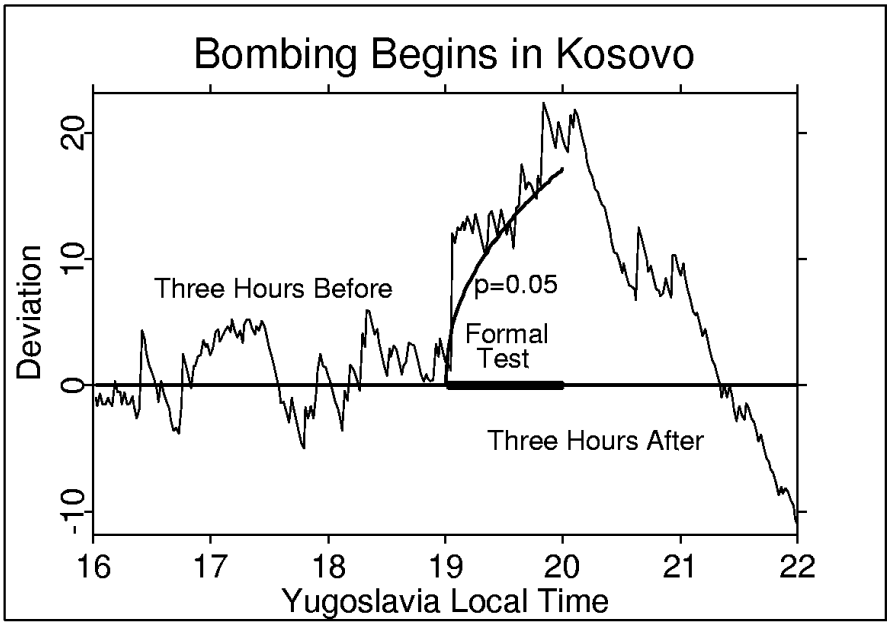

Figure 5: Three hours preceding and three hours following the beginning of bombing in Yugoslavia. Adapted from a figure by George deBeaumont.

Several other cases of violent disruptions of the social fabric have been assessed, and most, though not all of them show substantial effects. The clearest of these cases was the terrorist attack of September 11 2001, in which we see extraordinary departures of the data from expectation, to match the intensity of this event for world consciousness. Because this was an extreme instance of what we call a global event, it was processed through an unusually extensive array of tests, detailed in several publications (Nelson, et al., 2002; Nelson, 2002; Radin, 2002). Figure 6 gives one sample of the stark evidence that the data were affected. This figure traces the variance across the 37 REG devices (representing the average size of departures from normal scores) on September 10, 11, and 12. Early in the morning of the 11th, the eggs began showing consistently large variance, and that tendency continued until about 11:00 or a bit later. Then the variance of the scores compressed, and remained smaller than usual on average until early evening. This is a remarkable figure in many ways. The peak departure on September 11 has odds of less than one in a thousand, and is essentially unique; no other day in the four-year database shows such a large deviation. And if we read the graph directly, there is a perhaps more startling note: the EGG network began to react well before the first plane hit the World Trade Center towers. There may be a more mundane explanation (chance fluctuation is possible, though unlikely) but this looks like our global consciousness somehow registered a precognition, or a presentiment of the terrible events to come (Bierman & Radin, 1997).

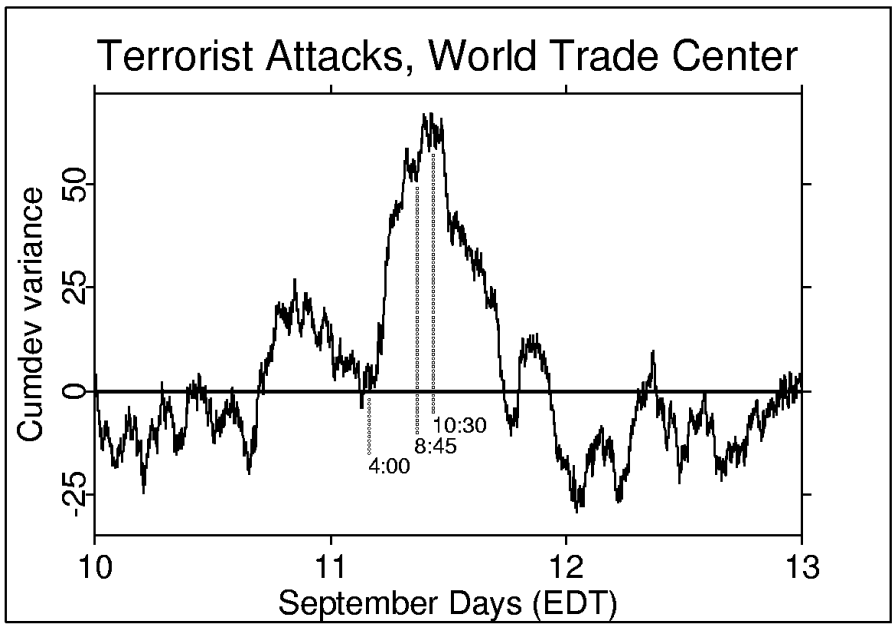

Figure 6: The variance data for three days, September 10 - 12, 2001, shown as the cumulative deviation of variance from its mean value. The beginning of the major change is about 04:00, the first plane hit the towers at 08:45, and the second tower collapsed at about 10:30.

Tragic accidents with some unique quality that gathers worldwide attention, such as major air crashes and shipwrecks, also have shown correlations with the GCP data. For example, Figure 7 is a four-hour period following the Concorde disaster in Paris. Other cases include the Kursk submarine tragedy, and the huge train-crash in India in August 1999. Somewhat surprisingly, major natural disasters often don't create a detectable effect on our network, even when they are powerfully moving. There are exceptions, however, such as the terrible earthquake in Turkey in August, 1999, where extreme geological or meteorological events do correlate with significant deviations in our data. Over time, we expect that repeated, careful observations of different categories of global events will help us to understand the variables that affect the EGG network.

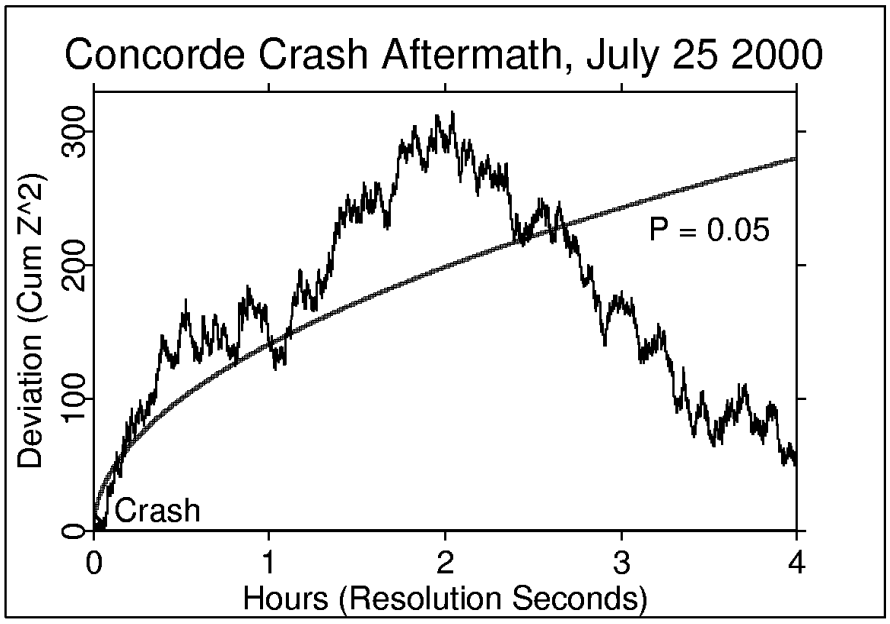

Figure 7: The crash of the Concorde affected only a small number of people directly, but it captured worldwide attention

There are many events that grab our attention on a grand scale. The spectrum is as wide as human experience. Some major global events evoke sadness and sympathy; others are celebrations, like New Years, expressing our shared interests in a new start for the future, and in simply having a joyful party. Recently, with the growth of the Internet, deliberately organized simultaneous meditations and peace vigils have proliferated, providing an opportunity to ask whether a small part of the world's people with an especially clear focus might produce a detectable variation in the fluctuating fabric of our data, and by implication, in the subtle matrix of global consciousness. There is no shortage of special moments in a large and complex world; life affords endless occasions to learn.

The intuition that there is a real sharing of emotion during big events on the world stage underlies our quest to see whether this shared consciousness state might have actual manifestations in objective data. An event that attracted a great deal of media attention and was followed with positive regard was the week-long pilgrimage of Pope John to the Middle East to sites that are regarded as the sacred origins of three of the world's major religions. The data, displayed in Figure 8, certainly do not look random. The sustained departure over six days was so striking that I felt compelled to extract and process a special "control" dataset to be sure there was no mistake.

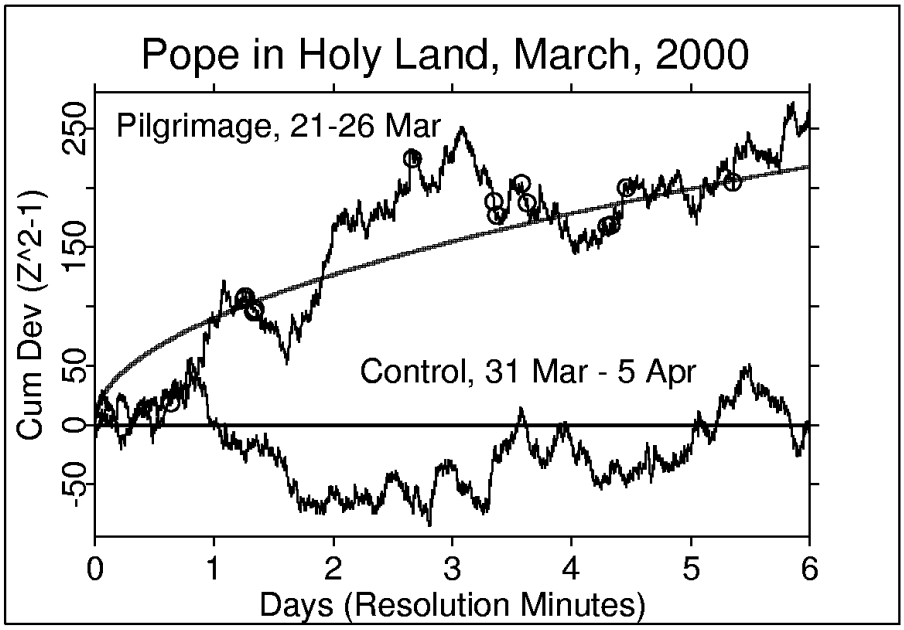

Figure 8: The Pope's pilgrimage to the Middle East was the center of news focus because it was a sign of hope for resolution of the unending strife. Small circles mark special visits and presentations by the Pope. The smooth curve shows a 0.05 confidence envelope. The lower trace is "control" data taken 10 days later.

An obvious global event for which widespread engagement can be predicted is the celebration at New Years, in which there always is great interest and participation practically everywhere in the world. One of the first items entered in the GCP Prediction Registry was for non-random patterns in the data collected during a period of 10 minutes surrounding the midnight transition to the New Year. The entry in the registry reads, in part: "RDN, pred. late August, 1998: New Year Celebrations: Expect peak deviation at midnight ± 5 minutes. Expect correlation structure to proceed through the 24-hour period." In other words, we predicted that there would be changes corresponding to midnight in each time zone, requiring an analysis that would sum the results for the whole 24-hour period. As a side note, my understanding of time zones was at that time unsophisticated, and the analysis used just 24 time zones rather than the 37 or so that actually exist because several countries use a half-hour offset for their local time. In any case the combination of all the celebrations in 1998, as the New Year arrived in place after place around the world turned out to be highly significant. The GCP data showed a persistent trend across the 24 periods, culminating in a chance probability of only about 3 parts in 1000.

Beginning with the 1999–2000 New Years, the famously awaited Y2K, we added a second type of analysis based on Dean Radin's prediction that the variance (variability among the eggs) would be reduced around midnight. That year and the two subsequent New Years confirmed this prediction. Figure 9 shows the data from New Years 2001–2002. The analysis looks at all 37 primary time zones, including several with half-hour offsets, and uses what is called signal averaging by superimposing the data around midnight for all time zones, and averaging down through the stack. This allows us to see a remarkable drop off of variance surrounding midnight that is not only visually compelling; in this case it has a probability of less than 1 in 250 of being just a chance

fluctuation (based on a permutation analysis, where the data are randomly re-arranged many times to see how often such a pattern will occur by chance).

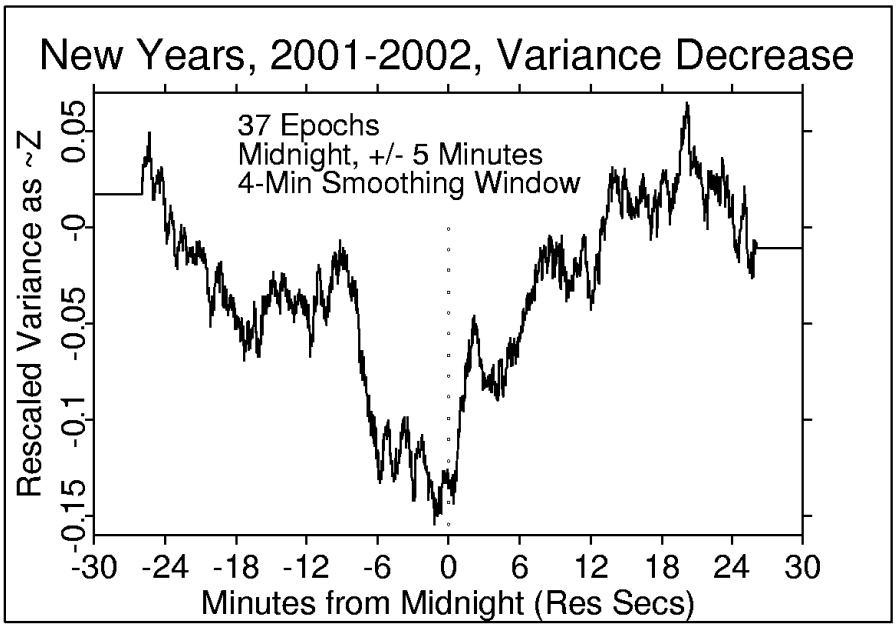

Figure 9: Signal averaged variance of 44 eggs distributed around the world. All data are extracted for the hour around midnight for each time zone, then averaged to produced a summary variance estimate for each second, centered on midnight.

The Bottom Line

In the first four years of the GCP, we have found two or three major events every month, ideal for testing the notion that we may be able to detect the presence of a shared field of consciousness, or alternatively, an equally remarkable effect of mere observation on the corresponding data. Some results are as striking as the picture of the New Year celebrations, while others have no suggestion at all of a departures from expectation. Over a period of four years, we have made more than 120 formal predictions from which it is possible to generate a bottom line assessment of the project's basic hypothesis that there will be a correlation of patterns in the REG data with special moments of widespread engagement of consciousness. The composite result, shown graphically in Figure 10, is a strong confirmation, and it clearly isn't just a chance fluctuation. The odds that this accumulated deviation from a random relationship would occur by chance is on the order of a million to one. Despite the subtleties inherent in the question we are addressing, these results give unequivocal evidence that some combination of factors has produced an anomalous effect associated with those special moments we have identified as global events.

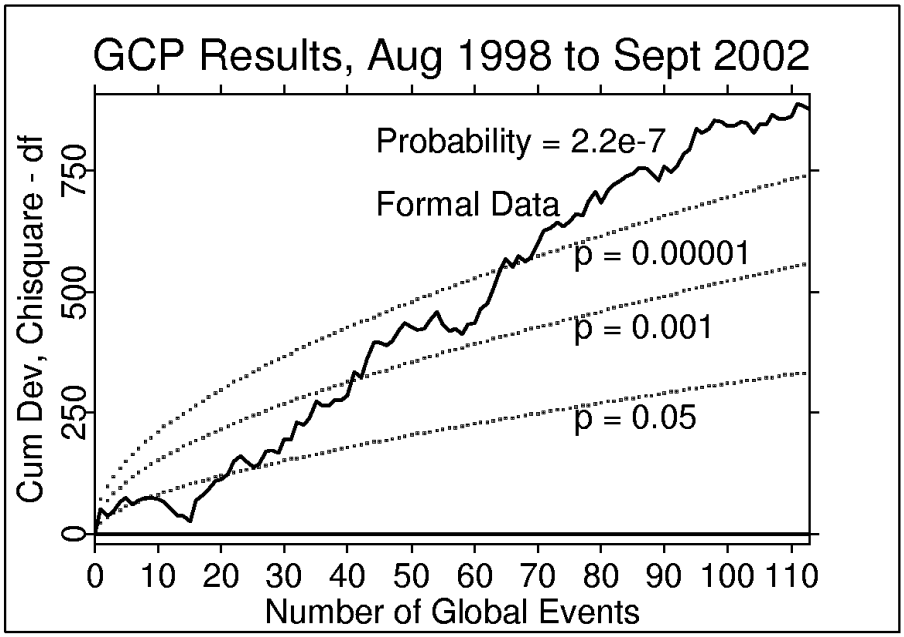

Figure 10: Cumulative total deviation of results for 105 formal predictions. The dotted smooth curves show the 5%, 0.1%, and 0.001% significance criteria.

Defining a global event is necessarily somewhat arbitrary, but there are some cases that most people will agree upon, and there are general ways of assessing the data to see if there is any unexpected structure. The main results are based on correlating specially chosen moments, usually drawn from world news headlines, with data taken at the same time by the EGG network. When we assess the correlations carefully, we find a tendency for the data to be different from what is expected of random data, leaving only a few possibilities to consider. It may be that the interest and desires of the people in the EGG project produce what is called an "experimenter effect" which is registered by the detectors. It may also be that the nature of the question we ask somehow shapes the outcome, and there may be subtle contributions from other sources. The results are remarkable in any case, but I think it is fair to say that the pattern of correlations shows a primary influence linked with the events themselves. While we cannot at this point claim that "global consciousness" is the responsible agent, my detailed experience with the complete database leads me to believe it is a good candidate for a major role. That is, I think the deviations are most clearly and most strongly related to the important world events and human reactions to them as the main source of the effect. We have found, for example, that correlations among the eggs are strongest when a completely independent measure of "news intensity" is high (Radin, 2002). This means that the experimenters don't need to identify the events specifically, or even to know about them; a correlation exists in any case. Over all, it is arguably simplest to interpret the anomalous trends in the data as evidence that something like our hypothesized global consciousness exists in a faint but detectable form. But there remains a lot of work to do before drawing that conclusion as a final interpretive model.

We can be quite sure these results represent a genuine anomaly, but at this point, it is not possible to offer a definitive explanation. There are suggestive interpretations that might begin to explain

these effects, although these remain speculative. One of the most promising physical models is drawn from David Bohm's theory of active information (Bohm, 1980). In his terms, information (and concomitant meaning) can be nonlocal, extending indefinitely throughout space and time. Active information may be envisioned as a potential field interacting in the development of manifestations in the physical world. Thus, active information is virtual, but when a "need" for it exists, the need actualizes the information by creating a repository for it. In such a model, the question we ask in the EGG project plays the role of the need for information, making it possible for the inchoate meaning of a major event resonating in global consciousness to manifest as subtle changes in the behavior of our detectors.

Suggestions like those made in many intellectual and cultural traditions, that there is an Earth consciousness, appear to have a modicum of scientific support in the GCP results. Similarly, the idea of a large-scale group consciousness, potentially engaging whole populations, gains some credence. At the very least, these results are consistent with the idea that a subtle linkage can exist between widely separated people, and that we may be interconnected on a grand scale by consciousness fields. A sequence of unlikely "chance" events leading to the EGG project has brought us the means to examine questions like this by looking for distortions of chance itself, apparently wrought by consciousness reaching out to connect our minds and to touch the material world.

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