

Gathering of Global Mind

by Roger Nelson

Part 1: History and Connections

There are times when we share with others a special, fully interconnected consciousness. When great music thrills us, or we are mutually inspired by an awesome sunset, or when we fall in love, we are transported temporarily into a shared world which is remarkable. This state of true intermingling is rare, for most of us, but it is experiential, and that means we know it for what it is; we feel it immediately as real and filled with meaning. When such an experience is past and we return to our normal, separated perceptions, the experience becomes a vulnerable memory, and our educated personality may reject the consciousness that knew this deeper connection. Yet, the suspicion remains that there is something of mind that is not just inside our heads. We feel interconnected with each other and the world in a profound and important way. We know at some level that we are not isolated, but interdependent, so that a subtle energy of mine can reach out and mingle with yours, allowing us to share a moment that is important to both of us. If we think of this potential extending beyond the two of us to a world full of living beings, we have the foundation for a model for global consciousness. Maybe, as Teilhard de Chardin believed,(2) the world ultimately needs that shared consciousness and is actively growing toward it.

The research described here points to subtle indications that we do live in an interconnected conscious world, in which we surely play an important role. We have shown immense capacities for both destructive and creative impact, and this implies that the future is ours to mold. It will be a desirable future in proportion to our level of consciousness, individually and globally. Fortunately, there are intriguing signs of an emerging integration of purpose and perspective in the world, though it remains fragile and as delicate as a newborn. For this integration to mature, we need great patience, and what we think of as "good luck." Perhaps by being more conscious of the possibilities, we can lessen the need for patience and increase our portion of luck.

The Global Consciousness Project

An international collaboration of researchers interested in the extraordinary potentials of consciousness did an experimental project that is asking whether some faint glimmering of a coherent global consciousness can be observed. The Global Consciousness Project (GCP), which is also called the EGG project, referring to its network of detectors, has its beginnings in a long series of coincidences that seems to manifest unusual orderliness, almost a design. Quite unlikely meetings and events have been instrumental in creating a technical structure which we think may have the capacity to register evidence of interactive connections of mind on a world-spanning scale. The project is, simply put, an effort to detect signs of a coalescing global consciousness. Coincidentally (or perhaps inevitably), this is happening at a time in history when it is just barely possible, yet seems most necessary.

The project emerges out of scientific efforts to study direct effects of consciousness on physical systems(3). The possibility that mind can be instrumental in the world is an idea with a turbulent history. Once, most of us believed that our thoughts had power, and at some level, despite the influence of a modern science that is pretty hostile to the idea of mind affecting the world, most of us still do. We only need to look at the prevalence of prayer or our foolish, but invincibly persistent willingness to gamble against the odds in casinos or at the lotto vendors. This is literally wishful thinking, and in one form or another, most of us indulge in it purposefully, despite intellectual convictions that mind cannot influence matters in the real world.

The notion of an influential mind was dealt a devastating series of blows by the successes of materialistic science. Descartes said mind was the only directly experienced truth, but that it was, on the other hand, completely and forever isolated, separate from matter. We could imagine another mind, but that mind could never register our imagination, and we must remain forever separated except for the indirect channels of sensation. Communication with each other could never be direct, but would require speech and writing and gesture. We might believe we could share with each other an identical emotion caused by music, but such beliefs about experience could never be tested, measured, quantified, and we knew from the teachings of successful scientists that nothing is real that is not objective.

Yet, at some level we are always aware of the deeper meanings and the real importance of personal experiences. We recall our childhood understanding that a stone or a tree or a river could be alive and share our experiences in a richly organic and anthropomorphic world. And we do find ourselves wondering about all the coincidences.

Meaningful Meetings

The first direct prototype of the GCP came about "by chance" when I met Jim Fournier and Juliana Balistreri in the middle of a December night in 1996 at Esalen, just as they were in the midst of promoting the globally organized Gaiamind meditation and I was thinking deeply about a network to detect glimmerings of global consciousness. They were traveling, and stopped just for an hour or two in the baths, but the sparkle in their eyes reflected the same stars as mine, and this created a moment for our paths to intersect. I went on to organize a collaboration to collect "consciousness field" data during the Gaiamind event, and it showed a significant effect.(4) This work was a prelude for our attempt to register effects of the world-wide expression of compassion at Princess Diana's funeral in September of 1997, which, coincidentally, was followed exactly a week later by the ceremonies for Mother Teresa. These were obviously prototypical global events.(5)

Shortly thereafter, forces that were to be essential to the development of the Global Consciousness Project gathered in Freiburg, Germany, in late November of 1997, but it was for another purpose, a conference I had begun planning a year earlier on psychophysiology and psi. Dick Bierman was there, and Dean Radin, and Marilyn Schlitz, and Jiri Wackermann, all in some way important to the EGG project. Indeed, the concept was vitalized when Dick and Dean and I were talking during a break about the complexities of physiological measures and the curiosities of nonlocal psi and possible

fields of group consciousness. Just a few weeks earlier, analysis of the data collected from a dozen randomness detectors in Europe and the US during Diana's funeral ceremonies had shown an anomalous effect that could only happen by chance once in 100 repetitions of the remarkable circumstances. Together with the Gaiamind results, this began to look like a truly global effect of consciousness -- like a global mind's inchoate thoughts. We were musing, and Dean whimsically put the odd bits of our casual conversation together as an image of a world EEG. That struck me as a fine metaphor, and the EGG was practically hatched. It seemed a natural extrapolation at the time, but it was both creative and very unlikely. Was this gathering of people, and the juncture of topics just a coincidence, or was there perhaps a field, an attractor, drawing together the pieces of a purposeful project?

Certainly it is hard to credit mere chance with the "coincidence" that Greg Nelson, my son, had the interest and the skills, and -- through a most unlikely combination of circumstances -- the time to create the exquisitely sophisticated framework of software for the EGG project just when the need arose. The EGG is Greg's delightful, richly metaphoric alternate name for the project, by the way. It means Electrogaiagram, a play on Electroencephalogram, and reflects similarities to the EEG technology used to record brain waves. Of course beyond this, the idea of an egg has extraordinarily diverse metaphoric linkages. Our more formal, public name, Global Consciousness Project, or GCP, came later.

The synchronistic links that ensured I would meet John Walker, the other main protagonist in the development of software for the EGG network and website, are yet more remarkable. I had, of course, some prior knowledge of the technological potentials Greg could make manifest,(6) but I hadn't the slightest notion of the important connections for the gestating EGG that would be made while I was searching the web in the Spring of 1998 for beautiful pictures of the earth to enhance the GCP website-to-be. There I accidentally met John, by re-discovering the Retrocognitive Psychokinesis experiment on his richly diverse fourmilab.ch website.(7) This was another essential link, bringing refinements and new aspects that enabled and enriched the growing EGG, and it is hard for me to think it was just a chance connection.

I could recount more such tales of coincidence apparently serving a purpose, but you know them from your own experiences, so let us now go on with the story of the GCP.

Converging Contexts

Three major threads of context were crucial in shaping the GCP. One is the history of research on consciousness and the development of measures that seem to capture direct effects of intention and group states of mind in an objective, scientific medium. Over the last few decades, technologically and scientifically sophisticated experimental work has produced incontrovertible evidence for effects of consciousness on physical systems, and evidence for anomalous interpersonal communication and acquisition of information about distant events.(8, 9) This research indicates a subtle but pervasive, nonlocal interconnection that is manifested by mind and consciousness,(10) and the findings seem consonant with the second thread, namely, ideas like those expressed so beautifully by

Teilhard de Chardin on humanity's purpose. He argued that we were to be the source and substance of a noosphere, a layer of intelligence for the earth.(2, 11)

Combining these suggestions, we are led naturally to the idea of measuring effects of a possible global consciousness, and motivated to hypothesize that there might be detectable signs of a consciousness field representing a coalescing interconnection of minds. In a sense, this represents an exaggerated but testable form of a question asked by thoughtful people in modern efforts to address consciousness in psychology and philosophy.(12) It is the hard question: is there something beyond the movement of molecules? Are mind and consciousness in a special realm that must be understood from a wider perspective than the physical which we have learned to measure so well?

The third element of contextual shaping for the EGG project is the extremely rapid emergence of our new, but already immensely powerful electronic interconnectivity via the Internet. Not only is the "web" a lively, growing, practically organic entity in itself -- with considerable similarity in many respects to Teilhard's noosphere -- it is a vehicle which, by way of some elegant software, enables real-time sampling of a possible consciousness field. The result is a unique opportunity that is only possible now in the most recent moments of our history, to "measure" the subtle effects of our hypothesized global consciousness. Teilhard warned that we should not be impatient, that his noosphere would develop over perhaps 10,000 years, but, remarkably enough, we can ask now whether there might be faint glimmerings of that integrated intelligence already beginning to show. That is the goal of the GCP/EGG project: to try to register the subtle first sparks of consciousness in a global mind.

Part 2: Research Tools and Results

Experimental Measures

Good research over a period of several decades has given a scientific expression to our experience of subtle interconnections, and it clearly shows that the human mind is not isolated within the body. There is solid empirical evidence that we do interact directly with each other and the world in the domain of consciousness, despite physical barriers and separations.(13) Repeated experiments show an effect on our instruments, not only of individual intentions, but also of group consciousness.(14, 15)

In the laboratory experiments, people sit near a device that produces random numbers, but they have no physical connection to it. They try to "commune" or "resonate" with the machine (called a random event generator, or REG) while wishing it to change its behavior to produce higher or lower scores than it should by chance. The accumulated research shows a tiny but highly significant correlation indicating that consciousness can weakly but measurably affect the physical world. What seems to happen is that the "noisiness" of the random sequence is changed very slightly. The amount of information or structure is increased and entropy or disorder is reduced. This may happen because it is relevant to our consciousness, which contains and expresses the necessary information and somehow impresses it on the environment. We apparently create a tiny bit of order in the world around us, simply by ourselves embodying structured information.

Consciousness Field

How do we jump from the lab results to "global consciousness"? Why should there be any effect of a world-wide New Years celebration, or a billion people watching a funeral ceremony, or the beginning of a war, 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 consciousness field carrying information, which may be responsible for the anomalous effects in "field" studies with REGs. These show consistent deviations of the data from randomness in situations where groups become closely integrated or focused on a compelling mutual interest. During deeply engaging meetings, concerts, rituals, etc., the data tend to have slightly increased order compared with the expected randomness, and we are able to predict this deviation, according to the type of gathering, with significant success.(16, 17)

In the GCP, exactly the same procedure is applied on a broader scale. We predict a detectable ordering in otherwise random data during world-scale events that are likely to engage the attention of large numbers of people around the globe. The prediction is tested by looking for slight, anomalous meanshifts in either direction, that is, changes in the variability of the data. The statistics for the continuous data streams registered by the EGG network have well-defined expectations based on theory and calibrations. We simply compare the empirical data with this background to see whether our hypothesis is supported. Simply put, we predict differences from expectation which are correlated with certain global events. If there is any effect of global consciousness on our detectors, we look for it to be concentrated during those special times when humanity experiences broadly shared interests, feelings, and reactions.

Operation

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. The questions we are asking are far from the mainstream, so our egg-hosts are unusual people, willing to try things off the beaten path. The network of some 40 eggs runs mostly without intervention, thanks to the sophistication of the "eggsh" program at the host sites and the "basket" program that collects and archives all the data at the main server in Princeton.(18) Even so, the sheer size and complexity of the network 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. When the electricity goes off or the Internet connection is lost for some reason, the data flow may stop for an egg. All the data are stored on the local computer, 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.

The Website

The main repository for documentation, and the primary communication interface for the project is a deep and comprehensive website at <http://noosphere.princeton.edu>. It has a professional face and facile navigation tools courtesy of Rick Berger, and it provides complete public access to all aspects of the project. The top banner buttons on the home page link to sections of the site concerned with the project's background and development, experimental methods and the prediction registry, access to the data in various forms, momentary activity reports, and information for people interested in participating in some way. There is a full history of the project, and more than most people will want to know about the technology and the network architecture. There is a complete description of the experimental design and methodology, and regularly updated displays of the accumulated experimental results. An "Egg Status" table provides current performance indicators and other information for each of the eggs, and an "Egg summary" page gives immediate access to scores and trends for every day since the beginning of the project, while the main "Results" page provides an up-to-date bottom line for the formal analyses. In addition to the automatically generated tables and graphs, the website also has some more colorful displays for the EGG, just enough to see how intriguing it can be to give aesthetic form to presentations of the data. A real-time visual display of momentary egg scores is accompanied by a heartbeat rhythm and gongs to signal large deviations, and we have movies of each day's data as the pattern changes around the world over the course of 24 hours, complete with data-driven music reminiscent of John Cage. The site also provides public access to all the data, and detailed descriptions intended to facilitate independent analyses by anybody with the interest.

Science on the Web

We set out from the beginning to have a balance of science and art in the EGG project, and that intention has helped to make the project more interesting while providing other benefits as well. The aesthetic motive keeps our broader purposes in mind, by posing the philosophically intriguing questions which are worth serious effort. The scientific aspect has a special role to play in providing useful, reliable answers. The science has to be done right, so we have given lots of attention to certain details that are in the background, but are essential if we are to learn something -- and avoid fooling ourselves. As George deBeaumont, who has done many of the formal analyses, puts it, "It is a subtle beast we are chasing." We know, for example, that the appearance of an effect is partly determined by how we look for it, so that the exact specification of the method has to be established prior to its application and before we have any knowledge of the results. Among the options, we can look at the raw, second-by-second data or we can block it first into scores for minutes or hours, etc. Somewhat surprisingly, such choices are quite important, and can determine whether a given event is regarded as significant or as showing no effect at all.

The website presents descriptions and discussions of our fundamental purposes and hypotheses, and it documents the specifications for analysis procedures. Most importantly, the GCP "Prediction Registry" maintains a detailed description of all formal predictions, including the precise identification of the data segments and the pre-planned blocking, if any. Exploration is also required, of course, to learn how best to formulate our questions, but the exploratory analyses are identified as such and maintained separately from the formal predictions. The formal predictions are explicitly identified and analyzed, and their accumulated outcome provides the statistical evidence needed for a scientific evaluation of the global consciousness hypothesis.

In response to a standing invitation, several independent observers regularly look at the GCP's procedures and results. They offer constructive critical comments and occasionally conduct independent analyses. Finally, since the original data are always available to the public for downloading, every analysis can be checked at any time by anybody who wishes to do so.

The Technology

Because they are esoteric, it is a little difficult to envision the actual measures and equipment that are at the core of the EGG project. The basic instrument is a random event generator, or REG, which is an uncommon device, although all of us are directly familiar 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 are an electronic equivalent of high speed coin-flippers.⁽¹⁹⁾ They work with measurements of "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 which 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 a "trial" from each REG device in the network, once every second. 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 1 shows the noisy trace of a sequence of actual trials from one REG device.

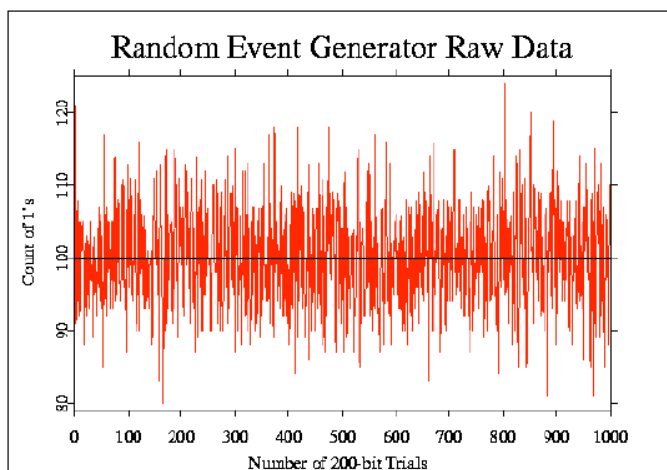


Figure 1: 1000 trials from an electronic REG. The horizontal line at 100 is the expected mean for the 200-bit trials, and the expected standard deviation is 7.071.

The result for each trial at each egg is, in fact, a varying quantity which 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. The next figure shows how closely matched the empirical and theoretical scores are, even in a sample of modest size compared with the large number of trials that enter into most of our analyses.

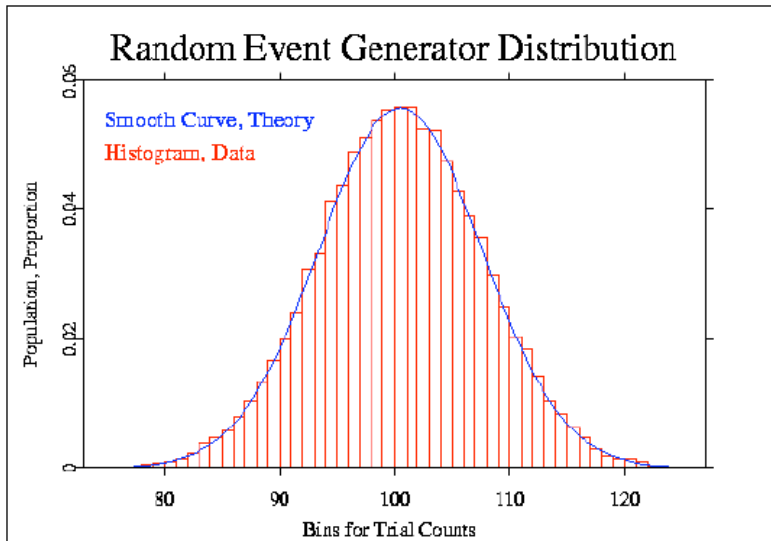


Figure 2: Histogram of raw scores, for 200-bit trials. The smooth curve is the theoretical normal expectation, approximated by the binomial distribution.

One of the best ways to visualize trends in the data is to graph the deviations of the average of the trial values from what is expected, and to display the accumulated total of the deviations. This produces a "random walk" 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.(20) The figure plots the accumulation of differences of a normalized version of the mean trial score, calculated across all the eggs for each second. This "Z-score" is squared to become a "Chisquare" quantity, which has a well-known statistical distribution. 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.

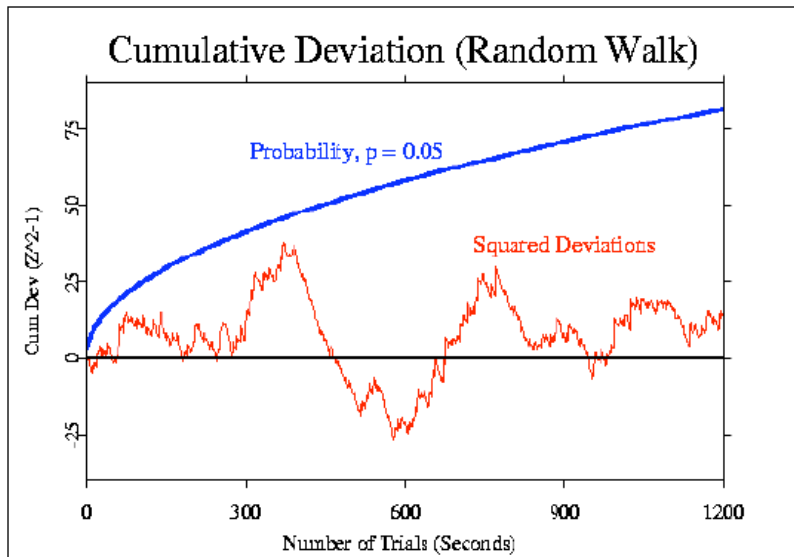


Figure 3: Trial scores are normalized (as Z-scores), then squared (yielding Chi-square-distributed values), and plotted as a cumulative deviation from their expectation. The resulting random walk is compared with a smooth curve which shows the 5% significance criterion.

Consistent departures from the expected mean value are easy to see because their cumulative deviation will have a slope or trend superimposed on the random walk. A consistent increase (or decrease) in the squared Z-score will tend to produce many steps in one direction, so that a trend will continue. Even a tiny effect will eventually yield a significant departure, with a low probability that it is a chance result. 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. We believe this measure may reflect our hypothesis that certain states of consciousness can affect the REG devices. In particular, we take departures from the normal, expected behavior as a measure of some manifestation of "consciousness," following principles derived from four decades of laboratory research which has shown that human intentions can affect the randomness of such devices in controlled experiments.

The EGG project is an application of tools and strategies tested in laboratory and field REG research on a larger scale. If we can register the influence of one mind, and see effects from a deeply engaged group, might we be able to capture effects on a broader scale? Why not ask if the whole world, at least occasionally, becomes sufficiently "resonant" to affect the same kind of technology? The question is posed by the GCP's network of continuously running detectors around the world. The data can be tested for correlation with events that may evoke a world-wide consciousness. In addition to the pre-network example Princess Diana's funeral,⁽⁵⁾ we have now a variety of cases that show departures from expectation that make sense if there is a burgeoning global consciousness. A few minutes around midnight on New Years Eve in 1998, 1999, and 2000 have shown striking results. Other cases are the first hour of NATO bombing in Yugoslavia, the August, 1999 earthquake in Turkey, the Pope's visit to the middle east in March 2000, the Kursk disaster, and the final resolution of the US presidential election. In a series of such cases

the GCP has asked whether world-scale events that engage global attention are correlated with increased structure in the data from appropriately designed instruments.

A Sampling of Results

The first actual data were taken in the working network on the 5th of August, 1998, with three eggs running, two in Princeton and one in Neuchâtel, Switzerland. The first event for which we made a prediction was the bombing of the American embassies in Africa on the 8th of August. This shocking breach of civilized practice was a focus for concern around the world, and our simple analysis showed a remarkable jump in the absolute scores at the time of the bombing, continuing for a few hours. In statistical terms, this inaugural "global event" showed one of the strongest effects we have seen, with a probability less than 1 in 1000 that it would happen merely by chance.(21)

We were off and running, but we also very quickly learned how difficult the task would be of understanding the messages presented by the EGG network. A week later, another shocking event struck the world consciousness: the Omagh bombings in Ireland. This time, in a situation that seemed terribly like the embassy event, the data showed not a glimmer of response. We settled in to the development of the growing network and to more thorough testing of our strategies for the assessment of occasional striking moments on the world stage. There were more tragedies, including airplane crashes (Swissair 111, off Nova Scotia about 20 miles from Halifax) and hurricane-induced disasters like the Casitas collapse in Nicaragua, but also some joyful moments like McGwire's record-breaking home run (admittedly a US-centered event). We looked at The World Peace Prayer at the UN on the 12th of December, 1998, the US Congress' impeachment vote, and then Christmas eve in Europe and the US. Many of these events had strongly suggestive positive data, but some leaned the other way, in the familiar mix of hits and misses that is characteristic of science at the margins of our understanding.

New Years, 1998, presented an excellent opportunity to test the essential notion that large numbers of us joining in a mutually engaging event may generate a global consciousness capable of affecting the EGG detectors. Of course New Years doesn't happen all at once, but again and again as the earth turns and brings the end of the old and the beginning of the new to each time zone. Our plan was to gather the data surrounding each of the midnights, and to compound all of the time zones into a single dataset that would represent a brief period marking the height of celebration -- everywhere. When this was done, the result was a spectacular confirmation of the prediction: data from the ten-minute period around midnight differed from what theory and calibrations predict, with a probability of three parts in 1000 that the deviation was just chance fluctuation. The scores were slightly, but consistently less random than at other times; they were more structured than they were supposed to be.

Figure 4 shows the composite trend, which steadily departs from the expectation for a typical random walk such as that shown in the previous figure for calibration data.

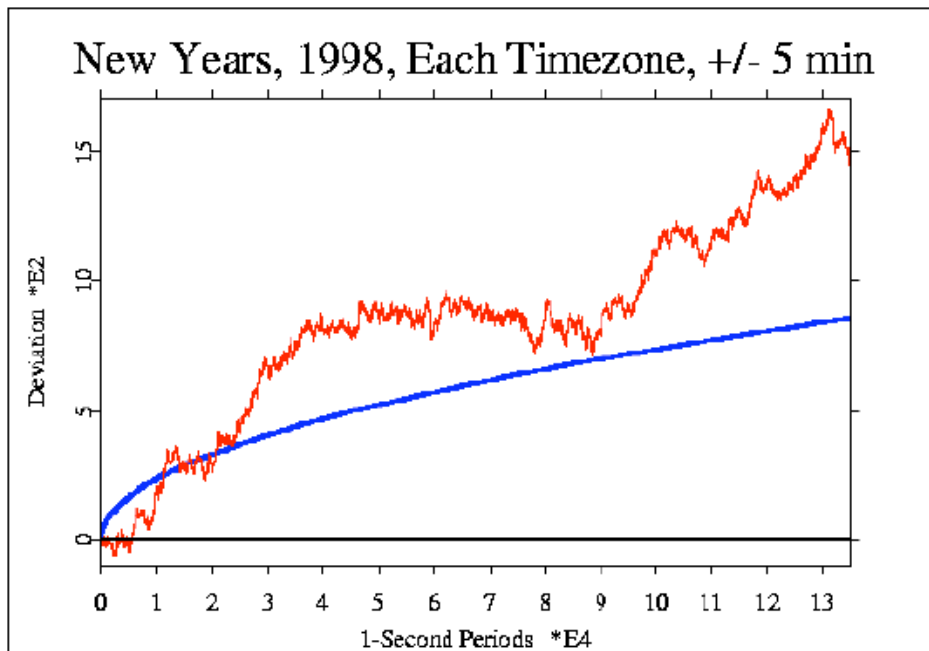


Figure 4: Composite data from all time zones, 10 minutes around midnight for the New Years eve transition, 1998-1999. The smooth curve shows the 5% significance criterion.

By this time, the network consisted of nine independent eggs in Europe and the US, and, since the data were accessible on the website, independent analysts could go to work. Richard Broughton took seriously the metaphor of a brain-like activity in the EGG network, and tested the hypothesis that the global reaction to the New Years transition would be similar to the reaction to a flash of light that evokes a response in the brain.(22) The evoked response is visualized by signal averaging, where recordings of several epochs of EEG data centered on the flash are superimposed. The random noise in such data tends to average out, allowing any consistent small signal, or response, to rise out of the noise. For the EGG data, Richard selected eight time zones where the celebrations would be maximal, and eight where few people live and hence there would be minimal celebration activity. When he did the signal averaging, the difference was striking, with a strong and steady trend away from the expected random trace for the "evoked response" in the maxi-celebrating zones, and a much weaker trend for the others.

Political events, at least those surrounding the Clinton impeachment trials and tribulations, which excited people in the US and bemused people elsewhere, don't appear to register with the global consciousness. We looked at the time around the House announcement of the impeachment, and then later when the Senate's verdict was given. Neither of these events was correlated with noteworthy deviations of the EGG data from their expected random walk. On the other hand, the beginning of the NATO bombing in Yugoslavia, March 24, 1999, was a very different matter. Here, the EGG data seemed to reflect the shock and dismay of the civilized world, with a data trace that shot upward just at the moment the bombing began. Then, two and a half months later, the EGG breathed a significant sigh of relief along with the world when Milosevic marked the end of the war and the bombing with a speech on June 10th.

On August 11th, 1999, a full Solar eclipse passed over Europe and parts of Asia, in view of large numbers of fascinated people. We predicted the event would generate a widespread coherence of attention and a correlated effect on the GCP eggs. The result was highly instructive. Overall, the deviation was not significant, but George deBeaumont separated out the seven eggs that actually were in the path of the moon's shadow, and extracted the corresponding data. For this subset the outcome was highly significant, with a chance probability of only 3 parts in 10,000.

Table of Eclipse, Eggs in path

id	location		peak			period		
			df	chi-sqr	p	df	chi-sqr	p
101	Edinburgh, Scotland	data	5042	5231.3	0.0308	9481	9687.3	0.0678
		control	5042	5023.5	0.5706	9481	9494.7	0.4585
1000	Amsterdam, Netherlands	data	4712	4812.2	0.1511	9421	9549.6	0.1743
		control	4712	4755.0	0.3269	9421	9372.6	0.6362
37	Neuchatel, Switzerland	data	4982	4930.0	0.6970	9961	9957.4	0.5083
		control	4982	4936.6	0.6735	9961	9960.2	0.5004
112	Neuchatel, Switzerland	data	4982	5082.8	0.1563	9961	10041.0	0.2843
		control	4982	4905.6	0.7772	9961	9898.0	0.6710
1022	Braunschweig, Germany	data	4742	4912.2	0.0415	9481	9588.8	0.2163
		control	4742	4529.2	0.9865	9481	9437.3	0.6229
102	Wien, Austria	data	4952	5170.1	0.0151	9901	10136.0	0.0483
		control	4952	5048.2	0.1667	9901	9987.2	0.2631
114	Madras, India	data	2372	2521.1	0.0166	4741	4843.5	0.1464
		control	2372	2379.9	0.4506	4741	4849.3	0.1334
		data	31784	32659.7	0.0003	62947	63803.6	0.0081
		control	31784	31578.0	0.7928	62947	62999.3	0.4407

Figure 5: Table of results for eggs in the path of the August, 1999 Solar eclipse. "Peak" refers to the anticipatory time leading up to the maximum shadow, while "period" refers to the total time. Control data are from the same time period a day later.

Although some other cases suggest otherwise, these eclipse results indicate that the REGs are most sensitive to relatively local influences, in apparent contradiction of one of our in-going assumptions, which says that the location of events relative to the eggs should be unimportant. If this indication is confirmed in other assessments, it means that although the anomalous interaction of minds and machines that we use for our measure is nonlocal, it isn't unboundedly so. The intensity of regard, or the concentration of attention may have an effect that is stronger on machines least distant from the people who generate the group consciousness. At the same time, we must emphasize that other evidence suggests a different relationship. We have to learn much more before drawing conclusions in this deeply complex area.

Sometimes great natural tragedies focus the attention of people all around the world. One of these was the terrible earthquake in Turkey, August 17th, 1999. The EGG data appeared to "see" the quake itself, showing a 1 in 100 deviation in the half hour exactly centered on the main tremblor. The biggest part of this deviation actually preceded the moment of the first big quake, suggesting that the EGG network might be sensitive to precursors or tensions that signal such an event. For this reason and because it was so striking, the event was examined in depth by several analysts. For example, Dick Bierman looked at the data from several perspectives, including a context of many hours of data before and after the

striking period of the event. He analyzed the data separately for eggs from different parts of the world, and found that the subsets show a common, though not unique, tendency to peak near the time of the quake. In this case, as we have seen elsewhere, the effects are dependent on the exact specification of the analysis procedure, and there is no absolute linkage of the ostensible source -- the earthquake, in this case -- to the deviations in the data.

Choices made in the prediction of the exact time period and the blocking of time within that period, are crucial to the outcome. For example, looking at the data in 10-minute blocks gives a different result from 15-minute blocks, and looking at the raw second-by-second data yields still another. Considering these observations within the context of an accumulation of successful predictions, we have to accept the possibility that some part of the apparent effect may be attributable to the experimenter or analyst choosing, albeit without any knowledge of the results, just the right time and exactly the optimal blocking of the data. Of course the result is still anomalous, but the implications and interpretations must differ. It is worth noting that the composite of US eggs shows stronger deviation than those in Europe in Dick's detailed analysis of the Turkey quake. Interestingly, the individual egg showing the largest effect was one of the most distant, in Fiji. Interpreted literally, this suggests the opposite conclusion to that of the last example with regard to nonlocality. Again, we have much to learn before reaching strong conclusions. For those interested in the details, all of the analyses and interpretations for this and other events are available on the GCP website at <http://noosphere.princeton.edu>.

Meanwhile, opportunities for conscious cooperation are enhanced in today's communication environment, and the idea of doing something about peace and the creation of a positive future has become the focus of an increasing number of organized "global" meditations or calls to prayer. The Yugoslavia war engendered a month-long "Prayer for Peace" with a specified time for people around the world to join for a few minutes in willing the war to end. A corresponding prediction was made, and the data showed a strong, though not significant trend. In October, 1999, a "Billion Person Meditation" for peace was organized, and the analysis showed a 1 in 100 probability for the corresponding EGG data. Five of seven such predictions have shown positive results, and two have been independently significant. The GCP itself sponsored one such event on January 1st, 2000, when we promoted a suggestion made by Mahadeva Srinivasan to take "Just a Minute" at noon to think about peace and the beginning of a millennium of progress for humanity. The relevant minute of data was collected from every time zone, and the one-minute epochs were superimposed and averaged. The result was a highly significant departure from expectation -- it could happen by chance, but only once in a hundred repetitions of the extraordinary conditions for this experiment.

Surely the most obvious prediction for the GCP to make was that there should be a strong effect of global consciousness at the Y2K New Years transition. People around the world had been thinking about Y2K in a crescendo of anticipation that would culminate in the most extensive celebrations ever. Indeed, the New Year and the new millennium were greeted effusively, in grand, televised spectacles all around the world, and in quiet observations with family or good friends. As a whole, we definitely were paying attention, and surely became more focused and coherent in our thoughts as midnight approached.

The main GCP prediction was similar to that for the preceding New Year, namely that there would be an accumulation of deviant EGG data during a 10 minute period around midnight. The result in this case was positive but not very impressive compared to the year before. On the other hand, a striking outcome was generated with a different analytical approach applied by Dean Radin. He predicted that the variation among the individual eggs (we had 27 running by this time) would decrease near the transition to the new year, and become very small just as everyone's focus centered on the stroke of midnight. His analysis showed a spectacular confirmation of that idea, with a highly improbable spike in the data, registering its greatest deviation just a few seconds from 12:00. The probability for this outcome was very impressive, on the order of 1 in 1000, even with an appropriate adjustment for multiple tests. As in other cases, this strong result provoked a flurry of independent analyses, and again we found that the exact definition of terms is a strong determinant of the outcome; some apparently similar approaches showed little evidence of an effect at midnight. Nevertheless, several converging analytical efforts appear to give support for the conclusion that the data around midnight going from 1999 to 2000 differ quite remarkably from the random quality they should have according to theory. In other words, the EGG data aren't random at that time, but instead show signs of having been affected by global consciousness. The following figure is my own independent look, from a similar perspective to Dean's but using a different statistic to represent the variability of the scores over the course of an hour centered on midnight. The spike in the center has a probability of 2 in 100 of being both so large and so close to midnight.

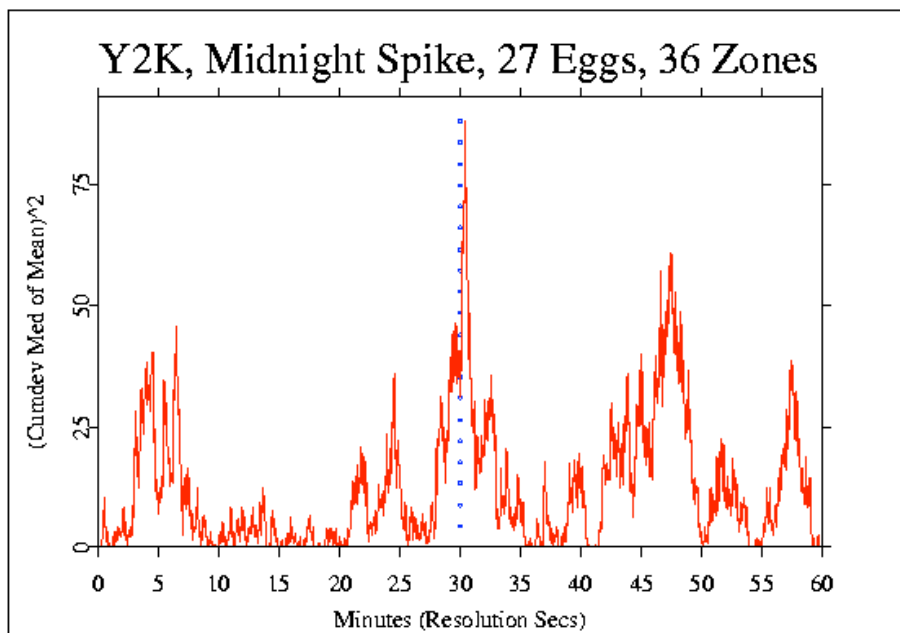
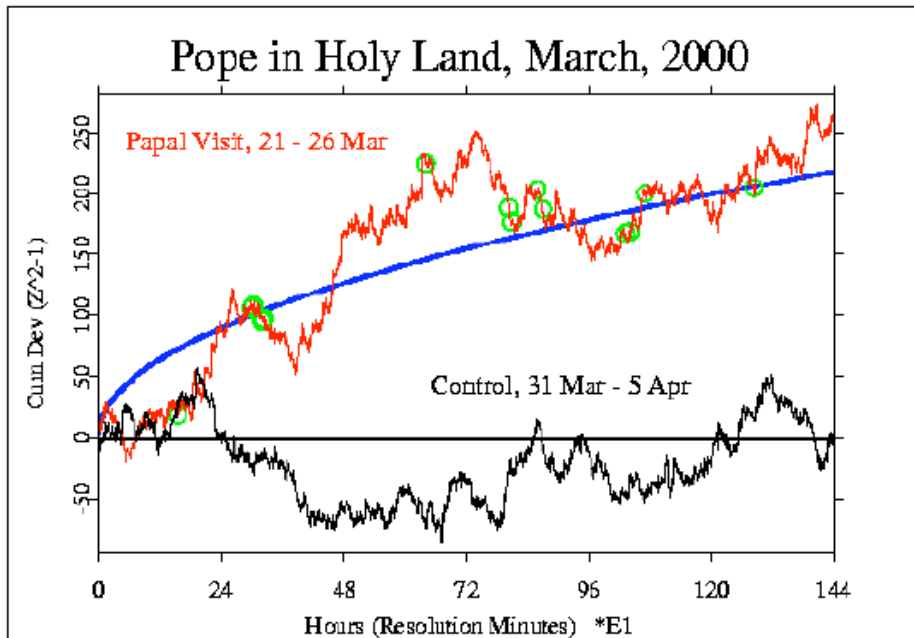


Figure 6: One hour of data surrounding midnight, Y2K. The cumulative sum of the median of the squared deviation of the mean from its empirical expectation, across 27 eggs, is plotted with all time zones superimposed.

We will end this recitation of examples with the recent historical pilgrimage of the Pope to the Holy Land in March 2000. The Papal visit was six days long, and incorporated many

individual events that might have some significance to the world. There was intense news coverage, and, though not everyone was pleased with the tour, people could be seen in the TV footage weeping for joy at the Pope's obviously heartfelt effort to lead in the right direction. For the GCP analysis, a decision was made simply to look at the accumulated deviation for the whole period, and the outcome was remarkable -- a steady trend over the six days, with a likelihood of a few parts in a hundred for such a strong effect. Such a long-continuing deviation was so unlikely that it seemed necessary to check that the EGG network and the analysis were functioning properly, so a similar sample was taken a few days after the Pope's visit ended. In this six-day sequence, there was no trend at all. Both data traces are shown in *Figure 7*.

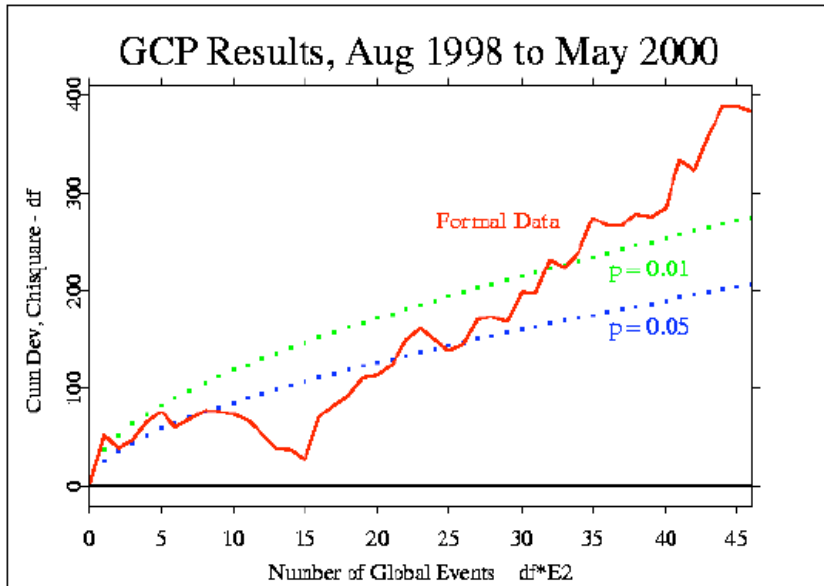


Papal Visit, March 2000

Figure 7: Six day's data recorded during the Pope's visit to Israel, March 2000, with control data beginning 10 days later. Circles mark a few important meetings and talks. The smooth curve shows the 5% significance criterion.

The Bottom Line

Over a period of some 20 months, we have made a total of 46 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 the REG data with special moments of widespread engagement of consciousness. The composite result, shown graphically in Figure 8, is a strong confirmation, and it clearly isn't just a chance fluctuation. The likelihood that this accumulated deviation from a random relationship would occur by chance is less than 1 in 1000. 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.



Overall Cumulative Deviation as of May 2000

Figure 8: Cumulative total deviation of results for 46 formal predictions. The dotted smooth curves show the 5% and 1% significance criteria.

Interpretations and Meaning

Defining a global event is a bit arbitrary, but there are some cases that most people will agree upon, and there are some adequately general ways of assessing the data to see if there is any unexpected structure. For example, Doug Mast has looked at inter-egg correlation structure for all of 1999, with results that are positive though not yet definitive (albeit apparently significant with a 1 in 50 chance probability). The main results are based on pairing specially chosen moments, usually drawn from world news headlines, with data taken at the same time by the EGG network. When we assess the correlation carefully, we find a tendency for the data to be changed from what is expected, 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 it is fair to say that the pattern of correlations shows a primary influence of the events themselves. Over all, it seems simplest to interpret the anomalous trends in the data as evidence that a global consciousness exists in a faint but detectable form.

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, which apparently are correlated with great events via what

we have called global consciousness, although these remain speculative. One of the most promising physical models for explaining the anomalies we see in this work is drawn from David Bohm's proposed theory of active information.(23) 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 global consciousness to manifest.

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 linked on a grand scale by consciousness fields. The 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. We seem to have captured a faint indication that Teilhard de Chardin's vision of our destiny may become manifest.

Global Mind?

If we read the great books and poetry, or look and listen to great art, it is clear that humanity has long since begun to exhibit its global destiny. Even though we cannot easily see it, there is an intertwining golden braid of great beauty that links our cultures. We have a poetic history, and, as Lewis Thomas said, if we want to know about consciousness, we ought to listen to music.(24) More specifically, he said listen to Bach, but each of our major cultural streams has its own Bach, and at this moment in history these streams are mingling and we are on the verge of understanding how much alike we all are. It is a small step to begin a global dance. We still need the communication channels of electronics and airplanes, but these are creating a common language and bringing us face to face with ourselves.

Perhaps the data from the far-flung EGG network ought to be viewed through an artistic lens too, and thus seen with the more perceptive heart. Though we start with a scientific attitude and maintain the clarity of purpose necessary for objective evaluation, it seems very important to open up the field of view to another, more creative eye, that of the subjective mind. After all, we wish to touch this new possibility of mind: an awesome, albeit immature, gathering of potential lying gossamer across the world. So, for a deeper understanding, we ought to make music with the numbers, and allow harmonies that might be hidden in the correlations sound out. And we should paint pictures and weave webs of meaning from the not-quite-random values sent by local eggs in Europe, and Africa, and Asia, and the South pacific, and the Americas. We want to mix these as sounds and colors, and combine them with the poetic insights that frame and sketch the design of an imagined global consciousness, just waking. In the meantime, science, with its highly

developed objective methods, succeeds in drawing some elegantly instructive pictures as graphs which turn the data into insights, and give a high perspective on the question. These have their beauty too, and they show structures where there ought not to be any, unless it is created there by some faint stirring of a global consciousness.

Is there an earth consciousness, a Gaiamind? Can we better understand our own place in the world? Can we create new meaning and give shape to the future of the earth? Can we record and play back the beauty of the most subtle aspects of the world? These are questions we wish to ask, and it appears that the answer to most or all of them probably is yes. As always when approaching the most subtle matters, however, we must accept that although there may be a deep simplicity, even a grand unity in the world, the manifestations we are able to examine may be very complicated indeed.

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