

THE ORGANIC VIEW

The book of nature is written in mathematical language.

—Galileo Galilei

Biological science has, until recently, presumed that each item and event in the universe can be separated from the others and studied in isolation. It has been assumed that solutions to any isolated part have meaning for the whole. Study peptides and genes, and there will be one-to-one, cause-and-effect outcomes that can be detached and understood; but seldom have these conclusions been brought into more complex experiments that would have established their interactions on a holistic basis. For example, individual insecticides have been tested for toxicity in foods, but almost never in combination. We know that each of the dozen or more chemicals that come into contact with milk from the farm to the bottle are used in safe quantities, but where are the tests on when these chemicals have been amalgamated, or heated together, or altered in any other combination?

Over 20,000 new chemicals are considered to pose no risk to health in regulated individual doses, but no one understands the long-term consequences of taking them together. Is there one that when combined with another triggers some of those conditions that are now on the increase, such as fatigue, declining sperm count, asthma, and so on? Science is skilled at testing each one in isolation, but has developed few mechanisms for assessing the whole. We can build an airplane, but have no idea why the atoms in its wings stay where they are.

It has been hard to come to a holistic view as long as it has been thought that biological interactions could occur only through physical contact, rather than through fields of energy. This shortcoming applies to all the allied sciences, to the medical drug culture, to surgery, and to psychology. This chapter presents some of the new evidence that signals, often bearing complex information, may be transmitted between and within organisms of all sizes, holistically and virtually instantaneously. Though fresh concepts are hurtling into view after the consternation that followed the “unsatisfactory” completion of the Genome Project, the giant sea-change that is now seeping through the biological sciences really began fifty years ago with monkeys.

The Hundredth Monkey

Science must provide a mechanism for the universe to come into being.

—John Wheeler

Most of us have heard the possibly apocryphal story of the hundredth monkey.⁹ What is seldom remembered is what followed. In 1952 a number of tribes of monkeys in Japan, all of one species but on different islands, were provided with sweet potatoes dipped in sand. They liked the potatoes, but not the grit on them. After some months one monkey on the island of Koshima discovered she could wash off the sand in the stream. Over the next six years a few friends and siblings learned the skill. The other adults kept eating the dirty potatoes. Then there came a moment when a certain critical number was reached, and suddenly every monkey in the group was washing their potatoes.

However, this was only a small part of the story. As soon as the monkeys on Koshima took up washing, the monkeys on the other islands, which were physically out of contact with the first group, began to spontaneously wash their own potatoes. The monkey field had been augmented to the level where it was able to move into a larger group consciousness that could be spread to the whole species, no matter where they were. When a certain critical number achieved awareness, this awareness was, without any direct contact,

communicated by some means other than speech or example, and was done precisely and instantaneously.

Without a verifiable connection between one tribe and another there was no scientific way to explain the phenomenon, and as no scientifically acceptable theory was available, the observations were ignored. The tantalizing questions opened by the Koshima monkeys have been dismissed as “mere correlations” or even “passion at a distance” — whatever that might mean — but no attempt has been made until recently to go further than that. Many scientists and doctors remain uncomfortable with the unanswered issues the experiment raised.

It was about the same time that Carl Jung proposed the concept of synchronicity to explain how connections could be made without direct contact, so that “coincidences” which lacked any true relational cause could sit within some theoretical framework.¹⁰ Almost forty years later Rupert Sheldrake expanded this hypothesis to provide a universal medium of communication that he called morphic fields. These include the simplest on-off signals, as in protein receptors, as well as the more complex fields of information in emotions and reproduction.

The argument that follows sets out to establish that events may be connected even when there is no apparent causal connection. It is the holistic premise that all organisms partake in a universe of information, that molecules carry signals that may include feelings and thoughts, that genes are part of the same global empire of signals as cells and proteins, and that every living thing is capable of adapting to every other. Together these ideas show that the vast complex of information being ceaselessly traded throughout all things, especially demonstrated in the human body, is not fully explicable through the conventional notions of biology. It is my purpose to offer another approach.

Morphic fields and synchronicity

The conditions in our universe seem to be uniquely suitable for life forms like ourselves.

—John Gribbin

Sheldrake defined morphic fields as precisely as he could — though the greatest precision is not always the easiest to understand — as “non-material regions of influence extending in space and continuing in time. They are localized within and around the systems they organize...and contain the memory of their previous physical existences.”¹¹ He postulated that these fields were as physically real as gravitation or electromagnetism and not “a bland background abstraction [but] a structure, which actively shapes and includes everything that exists or happens within the physical universe.”¹² He showed that non-material vibrations had the same capacity to affect matter as any solid object, and that it could do so without direct contact.

By providing a coherent theory for the concept of communication at a distance, he opened the gate for a widespread search for fields, for signals, and for memories, and intelligence within fields. One aspect of the theory was quite startling, especially for the 1980s: It was that “memory within morphic fields is cumulative, and that is why all sorts of things become increasingly habitual through repetition. When this repetition has occurred on an astronomical scale over billions of years, as it has in the case of atoms, molecules, and crystals, the nature of these things has become so deeply habitual that it is effectively changeless, or seemingly eternal.”¹³

This extraordinary yet simple statement opens up an entirely new attitude to the laws of nature. Sheldrake proposed that the laws are not necessarily permanent or immutable. Laws, in this theory, were determined by the sheer numbers of events and their repetition over eons of time, and remained permanent out of inertia. Lacking anything as huge or as ancient that could in any way alter them, they have spent the past 12 billion years getting used to each other. In fact, the most recent developments in optical clocks using a single strontium ion is suggesting that “the fundamental physical

constants — numbers that help define the laws of physics, such as Newton's constant of gravitation — may change over infinitesimally short times," suggesting that Sheldrake is right, and that usage modifies the laws, if only by amounts that are so small that they are only now capable of being traced.¹⁴

The resulting complexity is beyond any simplistic understanding, as fields would overlap and merge into each other without end. A single bee has its own field, which partakes of the field of all bees creating the resonance of bee-ness. This in turn is part of the morphic resonance of all insects, and so on *ad infinitum*. So field overlaps field, each existing within other fields that are themselves vibrating within greater ones while having an effect on all those smaller ones that are in tune with it.

The major aspect of Sheldrake's thesis was to define fields as "the medium of 'action at a distance,' and that through them objects can affect each other even though they are not in material contact."¹⁵ Though this provided the theoretical foundation required for understanding the action at a distance that occurred in the Koshima monkey experiment, it is an astounding notion. It seriously conflicts with our common sense view that there is a gap between subjective and objective reality. Yet in the past dozen years there has been a gradual shift in views, and the idea no longer seems so outrageous.

An example (see page 30) of connections that have no apparent significance, but are utterly fascinating when they occur and bring awareness to the possibilities for powerful correlations in our own lives can be seen with Abraham Lincoln and John F. Kennedy.

In another cogent story, there was a Russian experiment with eight little rabbits. It showed that when one of the baby rabbits was killed at random in Leningrad, the mother rabbit that was traveling in a submarine thousands of miles away reacted in a measurable way. Being on an atomic submarine that spent months under water without coming to the surface, there was no way the experimenters in Leningrad could have known where the mother rabbit was. Upon the submarine's return, instruments attached to the mother showed that it had registered a unique response to her babies' deaths. Though her behavior did not alter — she continued to

Abraham Lincoln and John F. Kennedy

President Lincoln was elected in 1860, Kennedy in 1960.

Their successors were both named Johnson.

Andrew Johnson was born in 1808. Lyndon Johnson was born in 1908.

John Wilkes Booth, Lincoln's killer, was born in 1839; Lee Harvey Oswald in 1939.

Both killers were assassinated before their trials.

Both assassins were known by their three names. Both names are composed of fifteen letters.

Lincoln's secretary, whose name was Kennedy, advised him not to go to the theater.

Kennedy's secretary, whose name was Lincoln, advised him not to go to Dallas.

Lincoln was shot at the Ford Theater, Kennedy was shot in a Lincoln made by Ford.

A week before Lincoln was shot, he was in Monroe, Maryland.

A week before Kennedy was shot, he was with Marilyn Monroe.

John Wilkes Booth shot Lincoln in a theater and ran into a warehouse.

Oswald shot Kennedy from a warehouse and ran to the local theater.

The funeral cortege for both presidents was pulled by seven grey horses, the only times in American history.

President Lincoln, it is reported, dreamed of his death a week before it happened. Had Kennedy? We do not know.

nibble and sleep — there were changes in her brain wave patterns that coincided exactly with the time of her little bunnies' execution.

The theory of morphic fields also applies to issues inherited from our ancestors. One of my clients came from Texas. She described her life as living behind a skin that shielded her from feeling anything deeply. In process she felt this skin clinging to her, wet and cold, and on inquiry recognized that it was fastened down her back with straps. The memory returned of being an Aztec priest putting on the skin of a man she had ritually killed so she could wear it to pluck the hearts out of a long line of prisoners. She carried the imprint of that religious killing in her skin. When she energetically 'took off' the skin, she found she was freed from the constrictive feeling. It later turned out that a remote ancestor had been Mexican, and the extreme trauma of slaying hundreds dressed in a clammy skin may have been passed down through the centuries.

Since Sheldrake has opened the door by providing a theoretical context, people have discovered a wide range of events that are connected without any apparent cause. It is like being given permission to think differently when a lot of effort has been put into saying it was impossible. When Roger Bannister ran the first under four-minute mile in 1954 he broke a belief that had prevented hundreds of people who came to within seconds of getting there from achieving the goal. It was a cathartic moment that I remember well. We had waited for years for this breakthrough, with runners coming to within parts of a second of crossing this barrier without doing so.

Discussion in the papers had concentrated on the 'obvious' physical impossibility of going beyond this limit, arbitrary as that limit was. And as everyone believed it, so it was. The resistance became so hardened that two Olympic games came and went in which the winners were just seconds from achieving this goal before Bannister did it. Then within weeks of him doing so the Australian John Landy had also broken the same psychological barrier. There may have been other factors, such as better lace-up shoes and so on. But the fact remains that runners hesitated for years and years before an unseen arbitrary resistance before breaking through.

Opening the door to a resistance can be very liberating. Over the past fifteen years it has become common to see the world as being filled with signals of information that influence our lives. Many people quite automatically see daily events as 'reflections' of their

moods. A common example is the car with a run-down battery, of which the owner will say, "I suppose it is telling me that I am really tired." As with the monkeys in Japan, when an unconventional idea is accepted by enough people it has a rippling effect and is more readily accepted by the majority. This is the stage that Sheldrake's morphic fields theory has reached after twenty-five years.

Scientists prefer physical contact

Verification depends on intelligence and not vice-versa.

—Isaiah Berlin

It has been understood for years that cells are gatherers of information. Their surfaces are covered in receptors waiting to garner signals from their surroundings. This is awareness at the root biological level. I was taught that cells are the mere building blocks of an organic system, organized like the troops in an army. It has turned out that they are among the most complex and well-organized miniature creations on earth.

Bruce Lipton has described it this way: "The cell is a carbon-based 'computer chip' that reads the environment. Its 'keyboard' is comprised of receptors. Environmental information is entered via its protein 'keys.' The data is transduced into biological behavior by effector proteins...that serve as switches that regulate cell functions and gene expression. The nucleus represents a 'hard disk' with DNA-coded software. Recent advances in molecular biology emphasize the read/write nature of this hard drive."¹⁶ It could be said that each cell represents a self-powered micro-processor.

Cellular activity has turned out to be far more intricate than was expected. Each cell takes part in many thousands of chemical reactions each *second*, and this is occurring in every cell in the body. Billions of signals and reactions are occurring all the time. They can read not only chemical signals (the conventional view) but also vibrational energy such as light, sound, and radio. Further, as the environment resonates with the receptors it will alter the protein's electric charge, and this causes the receptors to change shape, and hence their function.¹⁷

How do they keep in step? What directs this enormous activity toward harmony and survival, without wobbling out of control? There are feedback loops within the system that are too precise and too all encompassing and, more significantly, too rapid to be described purely as the action of molecules bumping into one another. Is there another way they could be acting?



Fig. 1 — The swirl and movement in vast galactic clusters is a massive expression of pure energy.

Conventional biomedical sciences hold that environmental information can *only* be passed on through direct contact, and has little time for synchronicity or morphic fields.¹⁸ According to this notion, receptors only recognize signals that *physically* complement their surface features, which is when their structures match and one bit contacts and fits into another. From the physicality of this notion comes the belief that signals can only be transferred chemically and only when objects actually touch. It is called the key-lock interaction because the physical form in one has to match the physical shape of the receptor in the other. It is a model of the interaction between separate entities. In other words, there can only be a reac-

tion after there has been contact. Signals at a distance, it is argued, can only be accepted when it is called gravity or electromagnetism, as in radios and mobile phones.

A world restricted to physical contact offers a lonely, if intellectually satisfying, picture of interacting bits and pieces without any feelings. This Newtonian world may be clearly defined and full of hopeful intentions for the betterment of mankind, but it nevertheless leads one to an arid, if not desolate, place. As Daniel Dennett so charmingly described this reductionist philosophy: "We are merely organic robots created by a research and development process called natural selection."¹⁹

Thus every effect needs a cause, and on the whole scientists are happiest when all the extraneous inputs can be eliminated so that there is only one measurable cause for each outcome. This paradigm is by now so well entrenched in the training of students at school and university that it takes a courageous mental shift to dislodge it.

Defenders of the prevailing attitude may develop a great deal of emotional heat when attacking the more fluid views to be described here. Words like "bunkum" and "complete nonsense" are used as arguments in scholarly journals, and the proponents may even be referred to as "'scoundrels."²⁰ There were cases where men with scientific training have employed conjurers and magicians as "experts" to disprove theories of fields and holographs.²¹ Can we take hope from the impression that such invective has the flavor of a rearguard action?

From personal experience in my medieval studies I know how such paradigms drive the academic world. One cause is that basic beliefs are seldom subject to re-examination once adopted, and the other, as Susanne Langer wrote, is that most human beings are afraid "of a collapse into chaos should our ideas fail us."²² They are also, once we reach the mortgage belt, the foundation for the way we make a living. One can understand how entrenched beliefs come to be maintained in the face of overwhelming evidence to the contrary.

"The central problem with the current theory is that it is too dependent on chance and requires a good deal of time. It can't

begin to account for the speed of biological processes. [But when] the vibration of one body is reinforced by another at or near its frequency, [they create] in Jacques Benveniste's words, a 'cascade' of electromagnetic impulses traveling at the speed of light. This, rather than accidental collision, would better explain how you initiate a virtually instantaneous chain reaction in biochemistry."²³ As Fritz-Albert Popp has argued, molecules speak to each other in a field that is nonlocal and virtually instantaneous,²⁴ which describes a world that communicates beyond anything that could be envisioned in a Newtonian system.

This is where the issues are being most strenuously fought. The most important questions on which gradual progress is being made are how does thinking occur; what is knowing and consciousness; why do cells replicate as they do; how is it possible for molecular processes to occur instantaneously; and how does the fetus organize some cells into becoming arms and others into legs even though they have the same genes and proteins? What is missing is some sense of an underlying organizing principle, such as an architect brings to the design for a building without which the pile of timber and bricks gets nowhere.

How we observe determines what we observe. If our only tool is a hammer, then everything looks like a nail. Mechanistic biology is like a hammer, so everything looks dead as nails. However, were we to observe with the holistic sensitivity of organisms, we might see organisms.²⁵

A universe of signals: nothing is ever alone

Reality is merely an illusion, albeit a very persistent one.

— Albert Einstein

The workings at every scale of the universe, from our bodies to individual molecules and photons, are bathed in a sea of signals. Everything is sending and receiving in a constant stream. Space, if we can call it that, is awash with more information than there is matter. Every bit sends out messages and receives them and, when congruent, acts on them. Ours is an information universe. There is nothing — not even granite — that can be called truly inert.

The cell is now being seen as an element of intelligence. This is a powerful word, yet how else can we describe something that is not only able to accept and reject signals, but to change behavior in response to these signals, and to alter its own maintenance system so that it can redesign itself and its offspring into new shapes and functions.

Every cell has the potential to be a completely autonomous system within an intelligent community of fellow systems able to adapt and animate themselves toward a communicable goal. In short, one might call each cell a small-scale version of any individual in human society — maybe less complex or powerful because it is smaller, yet still more than a relatively passive unit. This is why our bodies may be conceived as social communities with similar interactions between its members as a society presents between people.

Cells are largely made up of water, as are our bodies. The quality of our lives is intimately connected to the nature of water. There are 10,000 water molecules in the human body for every molecule of protein. When Lipton wrote “biological awareness is a measurable property,”²⁶ he was thinking of the experiments of French scientist Jacques Benveniste. In some impeccable yet controversial experiments he made it clear that molecules of water are “able to record previous contact with other kinds of molecules.”²⁷ This means that molecules of water, which are the basic building blocks of nature, can hold a memory without in any way changing their nature. Water remains water, even when it is carrying a message.²⁸ If a molecule can carry a signal-cum-message, how can it do so without leaving any evidence that the message has in any way modified the molecule itself? What is it *in the molecule* that is the carrier of that message?²⁹

“Information resides in molecules, cells, tissues, and the environment, often allowing these entities to recognize, select, and instruct each other, to construct each other and themselves, to regulate, control, induce, direct, and determine events of all kinds.”³⁰ This is a description of an interactive universe at every level of existence from the smallest photon packets of light to the largest galaxy. In this universe none of us are immune from influence and counterinfluence of and from every molecule in our vicinity.

In tests Benveniste has shown that electromagnetic signals are as powerful as the chemical that produced them, and that they acted in exactly the same way as the chemicals would have.³¹ Without any direct contact between the original substance and the organ, the organ still responded. This is the basis for homeopathy that is one form of vibrational medicine that is being successfully used every day by countless numbers of people. It works purely by resonance, for the original ingredients have been so diluted that they have left no measurable molecules in the medium. After their substance had been extracted all that remained was a 'memory' that had the power to affect our bodies.

In homeopathy vibration modifies structure in much the same way as an army marching in step will affect and ultimately modify a bridge.³² Unlike the tramp across the bridge, molecular vibrations seem to leave a permanent record. This record remains even after the molecules themselves that were the initial source of the vibration have been removed. It is as if the bridge would 'remember' the marchers for years after they had gone, and that we could connect with that memory to find out whom they were.

Benveniste received a great deal of criticism from many scientists as well as the pharmaceutical industry. The opposition was not always disinterested, for an editorial in one of the most prestigious medical journals, *The Lancet*, rejected his experimental evidence with the words: "What could be more absurd than the notion that a substance is therapeutically active in dilutions so great that the patient is unlikely to receive a single molecule of it."³³

To deal with the opposition, he arranged for his work to be tested in five independent laboratories in four countries. It involved some thirteen senior scientists, all of whom replicated his earlier results. For the next four years they continued to collaborate and jointly published their results showing that if solutions of antibodies were repeatedly diluted in the homeopathic way until the solution no longer contained any physical trace of the antibody, they would still get a response from the immune cells. They concluded that "specific information must have been transmitted during the dilution/shaking process" without the transfer of any material substance.³⁴ They are implying the core subject of this book: that fields

of energy remain after dilution, and that this energy has a measurable impact on material things.

Benveniste established that a signal could take the place of a chemical. The vibration in the signal is the transferable signature of the molecule. Not contact, but resonance, is the music of the molecule. In fact, his most recent work has concentrated on showing that the messages contained in molecules may be recorded on digital tape as if they were sound waves, and transmitted across the world by e-mail so accurately that the molecule can be analyzed in any other place. Carrying actual samples to laboratories is no longer necessary. He writes, "we are confident in our belief that we have elucidated the physical nature of the molecular signal. The principle is as simple as exploding a mixture of air and gasoline, but the consequences are more enormous."³⁵

This, and many other experiments that followed, have shown that modern pharmaceutical medicine is not the only way to approach healing. The core of the issue for those of us who have experienced the effectiveness of homeopathy and who have read even a little of the literature, is that signals, resonance, and memory are essential characteristics of matter. These are present whether the matter is the simplest particle or the most complex brain, and are retained without in any way changing the matter that holds them.

Chemical information can be transferred without having to connect to or pass through anything. Chemicals transmit independently, like a thought. The connection is not being made in the material realm, but in the other realm of fields.

There has been considerable opposition to this concept, in part because "what disturbs scientists is a [perceived] threat to their own image of themselves and to their relationship to knowledge, [for] the revolution would not simply be scientific, it could also become cultural, and homoeopathic doctors and their clients who use such 'folk remedies' would be vindicated and the scientific authorities who have frequently discounted them would look a little foolish. The idea of so disastrous a situation is enough to make scientists shudder."³⁶

This is where the work of Masaru Emoto is having an impact.³⁷ He has illustrated the way that water can be affected by thought and has what we can only call a memory to retain that effect after the thought has passed. Water is not a trivial substance; it is the very foundation of life.

His work exhibits Benveniste's experimental work. It shows that human vibrational energy in thoughts, words, ideas, and music can affect the crystalline structure of water. He recorded the crystals that formed when water was frozen. Water from clear springs show brilliant, complex, and colorful snowflake patterns, while polluted water forms incomplete, asymmetrical patterns with dull colors. When exposed to negative thoughts, such as 'I hate you,' the crystalline structure broke down completely, while the same water exposed to loving words reformed in perfection. This work has never been repeated in double-blind experiments, and the choice of photos he presents is more aesthetic than rigorous. Nevertheless, the general idea is so appealing that his work became an instant success.

It contradicts the cultural belief that change only happens when objects impact on other objects, and that if there is interaction it only occurs on the chemical level. Signals have no substance, yet Emoto's photographs show that a substance may redesign itself when in the presence of the nonsubstantial. That is, water changes with message, and can absorb and hold human feelings and emotions. As water is able to imprint and store information from molecules, this enlarges our "understanding of molecules and how they 'talk' to one another in our bodies."³⁸ Since every cell in the human body has 10,000 molecules of water to each protein, the ability of the signals in water to affect proteins skyrockets.

Water held in the hands of a depressed man will restrict the growth of plants and even diminish the germination of seeds, the opposite of what we call green thumbs. Over forty years ago experiments confirmed that energy radiating from the body could affect the health of plants.³⁹ Day to day practical farming experience tells us of the influence plants have on one another.⁴⁰ Called companion planting, there are subtle symbiotic connections that are carried

between plants, often underground, so that were we to place carrots next to tomatoes, both will grow better.⁴¹

It is the same with people. More is being discovered every day about how we radiate an influence far beyond our physical structure. Many health professionals subscribe to the notion that attitudes, especially around self-worth, can be triggers for disease. It makes sense that constant feelings of, say, unworthiness, would disorient our own cells, even to the point of mutation.

By defining learning as ‘acquired characteristics’ and signals as ‘information’ our whole worldview could be examined from a fresh point of view.⁴² It means that information transcends the material realm. Unlike matter and energy, which the First Law of Thermodynamics assures us can be neither increased nor decreased, the amount of information in the universe is rapidly increasing.⁴³ It is not kept in books nor hard disks, but in the signal senders and receivers themselves. So the question is: how and where is all this information held?

In 1984 Francis Schmitt was one of the first to call chemicals *information substances*. The word ‘information’ implies intelligence. Intelligence therefore resides not only in the mind and the nervous system, but also throughout the body to include every cell and every molecule. “It is not a matter of energy acting on matter to create behavior, but intelligence in the form of information running all the systems and creating behavior.”⁴⁴ It is not mind that rules the body, but mind and body as parts of the team that *become* the dynamic network of information that maintains and activates us.

Signals interact at all levels with each other, affecting moods and feelings, joy and sorrow. As the same chemicals are produced everywhere in the body, and these same chemicals control and are affected by mood, we can see that positive moods and thoughts rest at the core to our ability to heal ourselves. This is why emotional therapy lies at the heart of so many body-healing processes. In 1984 Candace Pert and Michael Ruff confirmed that “the same peptides found in the brain were also to be found in the immune system,”⁴⁵ and that “the immune system has memory and the capacity to learn...Thus intelligence is located not only in the brain but in the cells that are distributed throughout the body...The traditional

separation of mental processes, including emotions, from the body is no longer valid.”⁴⁶ In short, molecules, cells, and the messengers between have ways of acquiring and holding new information and passing it on to anything that is able to listen.

Information exchange is instantaneous

Mastery over the senses is brought about through concentrated meditation upon their nature.

—Patanjali Sutra

In biological systems signals are sent and received in both *physical and energetic* ways that initiate a tumble of cellular processes and changes.⁴⁷ Through a process known as electro-conformational coupling, vibrational energy fields can alter the charge in a protein, and may do so over great distances.⁴⁸

For instance, our responses to stress have been exquisitely honed over millennia of evolution. ‘Fight-or-flight’ reactions to life-threatening situations include shunting blood away from the gut to serve the large muscles of our extremities in order to provide greater strength in combat or speed to get away from peril. This includes increased blood flow to the brain to improve decision-making, dilation of the pupils to provide better vision, quicker clotting of the blood to reduce loss from lacerations or internal hemorrhage, and a host of other reactions that occur not only automatically, but also instantaneously. These responses are too immediate from one end of the body to another, and too varied to be explicable in the usual way.

The usual explanation is that a protein is created by the appropriate gene in a chosen cell, which then moves off, carrying the key to unlock the required response in another cell. As a model of communication involving at least four sets of instructions and quite a bit of physical movement throughout the body’s nervous and tubular systems, it would be far from the virtually instantaneous reaction we experience. Remember how quickly we pull back, shift on our toes and concentrate our attention when surprised. The time taken to make a thought is measurable, while the body responses are too instantaneous to measure. It is not like being

given even a well-known puzzle and having to 'think' our way through to the answer.

In the 1940s it was discovered that signals move along the nerves as quantum impulses at an extremely high speed. The impulse is a fixed shape, a little like a standing wave, and is not generated until a certain critical mass of information is reached. Then there is a sudden change and the signal moves in a nonlinear way that integrates with everything in its path for rapid delivery. These impulses are called solitons, and some have called them the 'elementary particles of thought.' Together impulse and pathway form a collective operation, a holistic system along which the wave front moves.

In most cases we would now call these nonlinear events. A linear system obeys very specific rules that are sequential, such as addition and multiplication. The laws of electromagnetism, which describe electric and magnetic fields and the behavior of light, are linear to a very high degree. Linear systems cannot be chaotic and unlike, say, the weather, and are not sensitive to small external disturbances.⁴⁹ The behavior of these systems is determined entirely by the forces and influences that emerge in its immediate vicinity. There are also nonlinear discontinuous events like explosions, cyclonic winds, and earthquakes. "Calculations indicate [that in nonlinear systems] there is a sort of 'memory' not possessed in any linear counterpart. It shows that the nonlinear world is holistic; it's a world where everything is interconnected, so there must always be a subtle order present."⁵⁰ In short, it is in the nonlinear realm that information can move through a system instantaneously.

A new paradigm of energetic communication occurring within the body at the atomic and quantum levels has emerged — one which is compatible with numerous observed phenomena that could not be adequately explained within the framework of the chemical/molecular model. The concept of fields as principles of organization, and from it the possibilities of holistic causes and action at a distance are transforming our view of the world.

The role of genes: a willing tool waiting for an instructor

How can the universe be some sort of perpetuum mobile, a self-existing, self-supporting, self-explaining magnitude, wholly complete in itself and thus imprisoned within a pointless circularity of inescapable necessities?

—Thomas Torrance

One of the most fundamental beliefs in biology, taught in textbooks and lectures, is that the characteristics of organisms are controlled by their genes. The concept underlying this is called genetic determinacy. The genes are supposed to control life by being able to ‘turn themselves on and off.’ From this it was once argued that the complexity of an organism would be proportional to the number of genes it possessed.

Many scientists are now concluding that this Darwinian concept that has held sway over our thinking for the past two centuries should be abandoned. Bruce Lipton wrote, “Single cells are capable of learning through environmental experiences and are able to create cellular memories, which they pass on to their offspring.”⁵¹

When a fetus is evolving in the womb each new cell carries every bit of our genetic code in its chromosomes, and somehow ‘knows’ what to do next and which part of the body it is to form. Each cell seems to know how many more like it will be needed, and where to go, and needs to know about its neighbors so together they will fit into the overall scheme. This sophisticated communication has to be present in the fetus from the very beginning, and then has to continue for the rest of our lives. Science still has no conception of how this works, how it is possible for the original cells to contain so much information and to pass it on so rapidly with so few errors.

This leads to one of the core issues in our understanding of life on earth: the issue of *how is our creation orchestrated*. The lack of any answer is so embarrassing that biochemists will almost never address the question. Twenty years ago Sheldrake pointed out that genetic theory does not explain how a developing system can self-regulate and still grow normally if some part of the system is removed, nor how we regenerate or repair damage and disease.⁵² Today this essential matter still remains unexplained. One wonders whether we have been looking in the wrong direction.

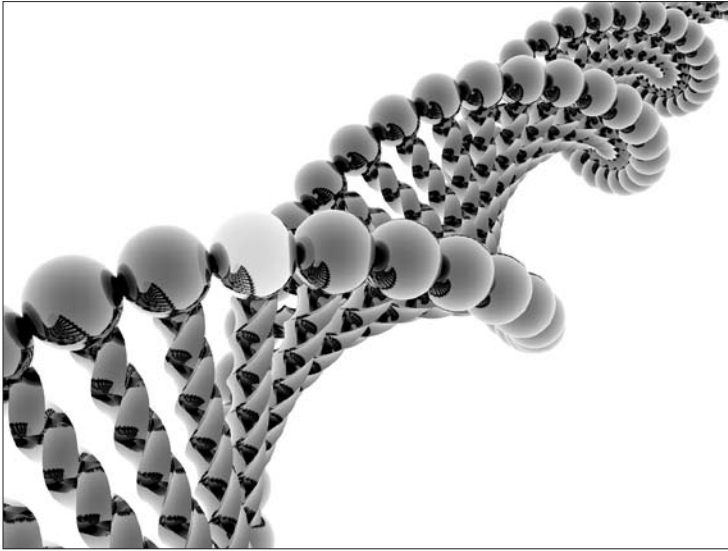


Fig. 2—Model of the DNA of two helical strands joined by chains of amino acids.

The Human Genome Project was designed, in part, to answer this question. Before it was completed in 2003, scientists had estimated that humans would need in excess of 120,000 genes to explain all its functions. As genes are primarily codes for creating the chemical structure of proteins, it was thought that there would be one gene for each of the 70,000 to 90,000 proteins that make up our bodies. And in addition to these protein-coding genes, others were needed to determine the complex physical patterns of specific anatomies, to distinguish each cell type (muscle from bone), to determine each organism (a chimp from a human), and that even more were needed to control behavior.

However, these ideas were dust-binned by the results of the Project. This enormously expensive operation revealed that there are only 23,688 genes in the human genome — less than a quarter of the calculated minimum!⁵³ How now to account for the complexity of a genetically controlled human when there are not enough genes to code even half the proteins? This has fostered fresh approaches to the issue and has added considerable complexity to our understanding of how genes function. It is argued that genetic interaction is far more dynamic than was once thought, and that individual

genes can have a number of functions, one of which may be to hide the potential function of another, a process called epistasis.

As research continued, this phenomenon became increasingly complex, suggesting there may be multiple reactions from a number of blocking or enhancing genes that can alter the behavior of their fellows. This represents a departure from the concept of genetic independence — the old idea of one gene, one function — to something that appears to be holographic.

The arguments about genes are much more fluid than they used to be, even to such ‘heresies’ as showing that genes do not wither without the nucleus. Lipton has extracted the DNA genetic code from cells and shown that they continue to function perfectly well without it — perfectly, that is, apart from reproduction. “Cells can live for two or three months without a nucleus,” he writes.⁵⁴ So, if the DNA in the nucleus does not tell the cell how to operate, what does?

Another conundrum is that the most primitive organisms have huge DNAs compared to their size and complexity. They carry more than half the number of genes required for an enormously intricate higher mammal. As Lipton wrote, “The 50+ trillion-celled human body has a genome with only 15,000 more genes than the lowly, spineless, microscopic roundworm. Obviously, the complexity of organisms is not reflected in the complexity of its genes.”⁵⁵ David Baltimore, a prominent geneticist and Nobel Prize winner, wrote, “it is clear that we do not gain our undoubted complexity over worms and plants by using more genes.”⁵⁶

Compared to chimpanzees, humans have only 450 genes that are uniquely ours, and we share the other 23,238. So what differentiates a man from a monkey? Though scientists are trying to find answers, when one reads between the lines, recent literature is full of phrases like “bound to be...” and “unlikely not to show...” and “could conceivably...,” all of which indicate a distinct loss of certainty.⁵⁷

None would deny that inherited genes have an important role. It is apparent, for example, in transplants of fetal eggs in humans and animals in which the baby comes out looking like the parent, not the surrogate mother, and identical twins separated at birth and

brought up in very different households, who show major similarities of behavior.

Matt Ridley has suggested that “just thirty-three genes would be enough to make every human being in the world unique, [as there are] more than 10 billion combinations that could come from flipping a coin thirty-three times.”⁵⁸ What Ridley did not say is that for this combinatorial concept to work scientists would have to admit that the underlying organization would need to be holographic.

There is a vast mass of DNA in all creatures that has remained unchanged for 400 million years. It is huge and has been dismissed as ‘junk DNA.’ Yet these same standardized bits in the helix of all creatures created the enormous variety of worms and dinosaurs and people. Does it provide “the hidden layer of information required to specify the precise placement of cells” in all the living organisms that have ever existed?⁵⁹

It was thought that genes had fixed functions that would never change, but recent work is revealing that the information that actually controls biological reproduction starts with the external environmental signals that trigger regulatory proteins that then influence and even change the gene, which then creates our proteins.⁶⁰ This is called the epigenetic mechanism. In other words, the DNA content is not fixed from birth onward, but can be modified during life. This work is little more than a decade old. In one experiment it was found that obesity in mice that came from diet could be passed on to the offspring, even if they were given a lean diet.⁶¹ This is literally food for thought considering our national health problems.

There is also the astounding evidence that organisms can share their individual genes with other species. In this way gene evolution can be speeded up as ‘learned’ experiences from one species can be acquired by another through gene transfer.⁶² As Lipton wrote, there is then “no wall between species,”⁶³ so one wonders what will now happen to our distinctions between species, or do we have to look on nature as a holographic whole?

Lipton goes on to write, “the sharing of information is not an accident. It is nature’s method of enhancing the survival of the biosphere.” Equally, through genetic engineering, it is man’s method for altering our own biosphere. However, this is happening in ways

we cannot foresee, as we have no holographic understanding. It has been found that laboratory genes in crops can, when eaten, alter the bacteria in the human intestine, as well as creating super weeds around trial crops.⁶⁴ These are dangerous trends, for through not understanding that everything is a part of everything else, we are threatening our continued existence on this planet.

The possible holographic model for genetic interaction would quite naturally include the proteins, and opens the possibility that the protein that throws the switch to turn on a particular gene may be more important in creating some characteristics than the gene. The differences between species may lie in the process whereby almost identical bundles of genes may be used to create most of the organic world depending purely on holistic interaction. The moment we raise this specter we sideline mechanics in favor of flow. Maybe we should start accepting the growing evidence that there is some other form-creation factor outside the genetic double helix. Maybe the physical sciences can show the way.