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# Biologic Architecture

## Buildings Inspired by Nature

by *Michael Rice*

Michael Rice

“When we rediscover the structure, nature and essence of life and what conditions optimize its emergence and expression, we can apply this understanding in the creation of truly sustainable and beautiful environments.”

Over the millennia, there have been countless design and building styles from simple earth huts to classic timber cabins to modern, so-called “intelligent” structures. No doubt, there will be many more as our technology continues to provide a platform for our apparently insatiable and, indeed, appropriate desire to express and create. We are in a constant dance with the elements of our environment and, as we transform it, it transforms us. What we construct and inhabit literally informs not only our biology but our psychology and our resulting behavior. We experience an alliterative continuum of building, biology and biography. The much used expression “You are what you eat” poetically encapsulates the reality that what we consume and how we consume it forms the basis of our physical, mental and emotional makeup. The same is true with how and where we live.

In recent years, there has been a growing awareness of an increasingly prevalent health condition known as Sick Building Syndrome (SBS). It manifests in many ways depending on the individual and the specifics of their environment, but symptoms include lack of energy, headaches, irritable bowel, skin irritation, nausea, insomnia, restlessness and many other debilitating physical and psychological reactions. Being in “sick buildings” leads to a literal breakdown in the integrity of the immune system of the occupants, which in turn affects every other aspect of their lives. There is a plethora of conflicting conclusions and beliefs as to what may be causing this, ranging from chemical off-gassing, poor air quality, lack of adequate ventilation, negative effects of some human-made electro-magnetic fields to the adverse influence of just plain bad design.

Most of us have spent some time in buildings that may feel as if they are, indeed, sick and we may have felt a deep survival-based desire to escape the toxicity of the environment. There is a literal stress on our bodies that when left unchecked can lead to disease or slow disintegration of biological function. It has been said that biology invented pain as a way to show us where to place our attention. I like this concept and it does, of course, make sense – when our finger touches something hot, a sensation of pain triggers an almost instantaneous physical response, which affects the rapid removal of the digit from danger. This is a simple and obvious example of the continuous biofeedback we engage in with our environments.

Our bodies wish to be healthy and vital, representing a strong natural desire rooted in the genetic imperative to remain biologically viable. Each cell in our body is independently able to detect and respond appropriately to both positive and negative influences in our environments. In simple terms, a cell will move towards any source of food and energy, and away from any source of toxins or danger. When all the cells in the multi-cellular communities we call our bodies (approximately fifty to seventy trillion cells) get together, the effect is massively amplified, resulting in a remarkable innate ability to detect sources of energy and information that will support the community, as well as afford the awareness to detect toxins or danger. In effect, we have the skills in our bodies to know when a space is good or bad for us. However, sometimes the negative stresses we experience are more subtle and less obvious to us, affecting us over time, making awareness and perception less likely to kick in.

Modern society does not actively support or encourage the idea that we are completely energetically integrated with our built environments. It could be said that to do so would ultimately lead to its destruction, as people became more aware of the adverse effects and stresses bombarding us everywhere we go. So, to some extent, there is an opportunity to take greater personal responsibility for our own education, our own health and our own built environments.

It is worth saying at this point that I know we are capable of so much beauty and life supporting expression. When we operate from a place of awareness, integrity and open creativity, we discover ways to manifest timelessly beautiful spaces that support our bodies, uplift our minds and nurture our spirit. Rather than focus on the many ways we do not do this, evidenced by the structures most of us live and work in, I concentrate on developing the awareness and the skill base necessary to design and build with more beauty in more sustainable equilibrium with our

environment. The information in this article is for everyone – not just architects – since we all play a part in the creation and maintenance of our built biology.

To paraphrase Albert Einstein: We cannot solve the problem with the same mind that created it. We could benefit from a new language, a new understanding and a new philosophy that is based as closely as possible on the pure principles of natural emergent living design. The opportunity now exists to really study and emulate how Nature creates and expresses sustainably, with ease and elegance.

I am not advocating just surface level bio-mimicry, or inducing pseudo organic forms just for the sake of it, or the myopic and ultimately limiting focus of some “green” architects and designers. As an exercise in expanding our minds, it is worth considering that the green color of plants is perceived by us because it is the very color that living organisms “spit” back or reflect, in other words, the one color of visible light that plants “reject” is green – the color that we use as a phrase and metaphor for all things living!



Michael Rice

I am suggesting a pure principle set of natural rules or algorithms based on those observed at every level of natural expression. When we rediscover the structure, nature and essence of life and what conditions optimize its emergence and expression, we can apply this understanding in the creation of truly sustainable and beautiful environments. I am not claiming that I or my associates have the final cornerstone of truth on this vast subject – far from it. We continue to learn, practice, assess and express and, as we do so, our understanding and awareness increases – this is the very underlying principle at work in all emergent life systems.

We call this design philosophy and practice Biologic Architecture. The great philosopher Winnie the Pooh provides me with a good basis from which to begin to describe the underlying principles of Bio Architecture. He simply said, “Simplest is Bestest.” Without this natural Pooh Protocol, we can easily become bogged down with abstract concepts, unfamiliar language and ultimately useless, opinion-based information. It can also be very beneficial here to incorporate the added wisdom of another great philosopher William Occam, the 14th century English logician and Franciscan friar, who formulated the often used principle that has become known as Occam’s Razor: “The solution or answer with the least number of assumptions is the one most likely to be right.”

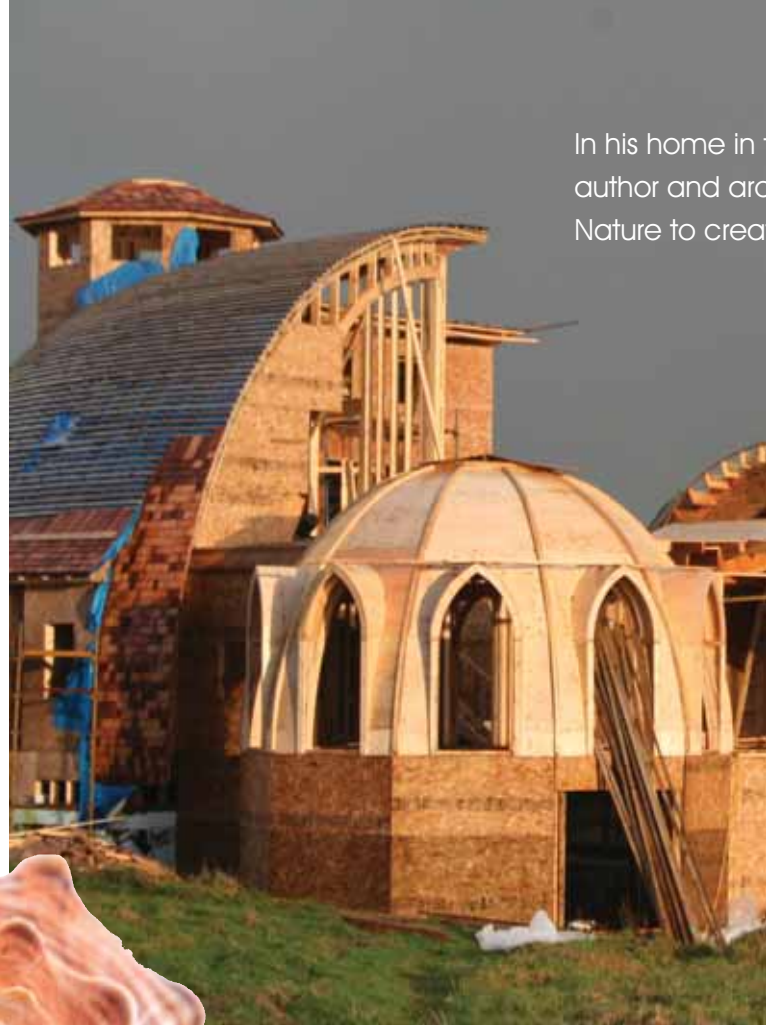
In combining both philosophies, it becomes possible to share some timeless design principles with some very practical applications. I am actively seeking to minimize the inherent as-

assumptions on which this article is based, but freely admit to one assumption: I believe we all share a common desire to come into balance in our environments and to express ourselves in what we think and say – in how we look and in how we create our worlds. This desire fuels an ongoing, albeit sometimes subtle, search for information, knowledge and wisdom that will allow us to grow and thrive. If you find yourself reading this, then know that this basic drive is at work, helping you in ways that would astound you.

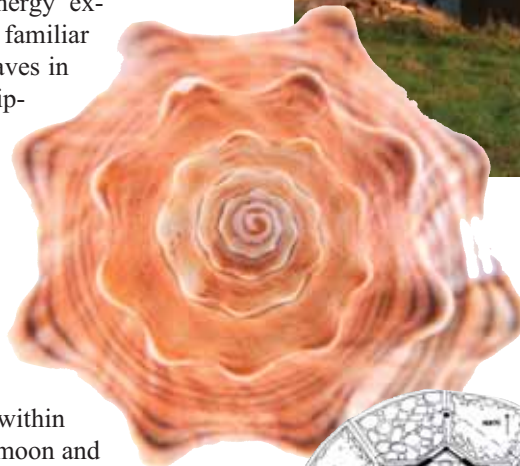
Science has, in some ways, caught up with ancient wisdom, most notably in the now fully accepted understanding that everything in the Universe is “made” of energy. Atoms, once thought to be solid things forming the basic building blocks of matter, are now considered to be more accurately defined as constantly vibrating patterns of energy. One physicist bemusedly noted that the more he studied the quantum realm, the more he began to see atoms less as things and more as thoughts! In essence, we can usefully describe the most fundamental nature of Creation as the energetic interplay of different vibrational frequencies.

This is where Winnie and William may frown at my choice of words; after all, I did commit to keeping this simple! So simply put: Everything is energy and energy expresses itself as a wave. A wave is a familiar pattern to us, as we can see and feel waves in our everyday lives, from raindrops rippling in a puddle and crashing waves at the seaside to the rising and falling harmonics of music and the up and down motion of a boat. If we extend this understanding a little further, we begin to see that every aspect of our existence consists of waves waving! Our thoughts are waves, our breath is a wave, our heartbeat is a wave and our sleep wake cycle is a wave, all nesting within the larger wave cycles of the earth, the moon and the sun and beyond. Bringing this concept back into focus, we can appreciate that if everything is energy expressing itself as a wave, then it makes sense to develop some basic understanding of how waves interact with each other, in order that we can apply this knowledge to the creation of spaces that support us on every level.

To illustrate how waves meet, we can begin by holding our hands out in front of us, with our elbows bent, palms facing down and our fingers facing each other. Increase the distance between both hands as much as possible and then begin to move them together slowly, tracing a wave-like movement. You will notice that, as your hands move towards each other, they trace out a wave in the air with your fingers leading – known as the “wave front.” You can see that the waves have an up and a down, a crest and a trough, and a rising and falling pathway between the two. When your fingers meet and the wave fronts touch, they begin to interfere with each other. It may be that the fingers of the right hand are moving downwards just as the fingers of the left hand are rising, in which case we say that one wave cancels or destructively interferes with the other, and the result is that both waves meet their end, so to speak. If your fin-



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gers meet when both are on an upward (or downward) movement, then the interference is known to be constructive, and the resulting wave pattern is the sum of the two parent waves.

This can be seen beautifully if you drop two pebbles into a pond or a lake. The impact of the stones when they hit the water creates a circular wave front pattern, which radiates and extends out as a series of growing concentric circles.

And when these two impact wave fronts meet, there is a lovely interference pattern, consisting of little peaks and valleys. There is no good or bad interference; there is just interference! But in the creation of matter, form and life itself, Nature likes it when waves meet and greet constructively, as this affords the possibility of the emergence of more complex living systems. This is where we begin to see the same natural patterns, symmetries and shapes being manifested and expressed at all levels, from atoms, molecules and cells, to landscapes, planets and galaxies.

So to recap: Everything is energy expressing in waves, these waves are constantly moving, meeting and interfering, and the resulting patterns give rise to everything we see and feel around us. When we observe and study living systems and healthy envi-

the Bloom Mountains in the heartland of Ireland, architect Michael Rice has used the language of nature to create a healthy, inspiring, energy efficient living space.



Michael Rice

continue to emerge regardless of the scale or magnification of the form. We can see fractality at work when we cut open a cabbage and marvel at the fantastic spiralic forms, all moving towards the centre like water cascading down a plug hole. We see fractality at work in the opening of a rose, or the seed arrangements on a sunflower, or on a pine cone or pineapple. And, of course, we see it when we look again at our tree.

There appears to be a basic structure, anchored in the Earth, which continues to branch and divide in order to maximize expression, stability, distribution of food and energy, access to light, all with a minimum use of materials (a good example of sustainable development!). Our friendly waves are effortlessly interfering at all levels, utilizing the same geometric symmetries to create such beautiful life forms. It is again worth noting at this point that it is not necessary to have or be able to express the apparently complex mathematics that gives rise to these forms; it is more than enough to be able to see and recognize them at play in the world both within and without us.

Ultimately, one specific number, expressing itself as a ratio, continues to emerge at every level. This number is called The Golden Ratio or Golden Number or – perhaps more sustainably – as Phi, pronounced “fie.” This number is taken from the Greek alphabet and depicted as a circle with a line through it. Numerically, it is expressed as 1.618 and, as a ratio, this number would be expressed as being relative to another. Visualize a rectangle, with a height of 1 unit and a length of 1.618 times this and you can see this relationship in a very graphic and attractive way. This rectangle and the spiralic pathway that self-generates within it has been used as a literal definition of beauty and perfection in nature, art and architecture. In fact, Phi is observed to be the primary shaker and mover in virtually all natural processes and emergent forms. It is considered the most beautiful ratio in Nature, and the very bond that holds everything together through resonance and self-similar harmony at all levels of expression (called Fractality).

Countless cultures over thousands of years have used this shape and its geometric derivatives as the primary generator of form in their artistic and built environments; from jewelry, pottery and buildings to huge stone and earth landscape formations that mirror and project the cycles of the earth as it spirals through the heavens. From the atom, DNA, cells, plants, animals and humans to weather patterns, solar structures, sacred structures and the harmonics of the heart, the Golden Ratio is in everything. Our ability to perceive and make fundamental sense of our world is entirely based on this geometry. ▷

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environments, we see certain geometries and harmonies being expressed with a beauty and precision that is quite breathtaking. The word “geometry” means the study and measurement of the earth and the sometimes used expression Sacred Geometry (an older name for Biological Architecture), means the truly sustainable underlying natural wave symmetries and organic patterns that give rise to life.

In school, most of us would have had some exposure to basic geometry, learning about circles, triangles and squares. Much of this subject may have been presented to us in a rather sterile way, lacking real life context, and so it is no surprise that we may still harbor some resistance or even distaste for the subject. Knowing the math behind the parabolic path trajectory of a spherical object is not a requirement when we play football! It is all about context and natural application. By becoming open to revisiting some of the principles at work in how our world is shaped, and by supporting and upgrading our natural instincts and inherent knowing with this information, we can develop wonderful new ways to express life and create sustainably.

When we observe a tree, we do not see a triangle or a circle sitting on a thin cylinder. Rather, we observe a complex sequence of growth patterns that seem, with keen eyes, to follow some basic geometric harmony. This geometry, referred to as Fractal Geometry, was first popularized in the 1980s, when computer technology afforded us the chance to see some stunningly beautiful natural patterns emerge on-screen when we inputted certain mathematical equations that were derived from studying Nature. Fractal Geometry displays shapes that con-



Michael Rice

Building material, like food, can more effectively carry life force if it retains a Nature state as close to its living condition as possible. For instance, wood is a better conductor of biological charge than steel, and hardwoods are better than softwoods.

When we consider the previous discussion concerning waves and how they come together, we discover that the Golden Ratio creates an essential biologic and perhaps even a spiritual principle. This harmonic pathway allows waves of energy to literally turn around and re-enter themselves, which creates the perfect compression that is a requirement of the perfect distribution of energy. (Winnie the Pooh is politely stepping in here and reminding me to stay on point!) Suffice it to say that the Golden Ratio, expressing itself as a wave relationship, allows the energy of the Universe to anchor and express itself as a living matrix of creation. Fractal Geometry, based on the Golden Ratio, is the means and the result of this quest for emergence.

In essence, Life occurs when biological structures learn how to gather electrical charge in enough different wavelengths to cause them to compress (implode). When two or more waves gather in one place in the harmonic ratio of Phi, they literally begin to suck in an infinite number of other waves non-destructively, which, again, is the very definition of life.

Applying this pure principle to architecture and design, we find that we now have a set of natural algorithms that can be applied to all aspects of our design education and manifestation. Although it is understandable that all of this knowledge and information may appear a little too complicated or indeed intellectually contrived at first, in reality it is a verifiable, valuable and very accessible tool for natural and healthy design protocols.

In Chinese and Indian traditions, healers would only be paid if their patients maintained health or got well again after being treated. Can you imagine such a scenario in our modern world? Picture our top doctors, architects and engineers relying totally on a healthy outcome as dictating whether or not they got paid and therefore stayed in business. Imagine the ready availability of a simple hand-held device that could scientifically measure the capacitive charge density (life force) of a new building, with

the designer's fee being a proportional projection of this reading. Imagine such a device being expanded to demonstrate what a truly healthy space is, and how hospitals or schools may not be the best places to go to for healing or learning.

Such a scenario is not far off and, as I write, the technology is currently being developed that will produce such tools of detection within a few short years. Our biology already knows when a place or space does not feel right, and the principles of Biologic Architecture may, I believe, point us in a new direction to remember and incorporate the knowledge and the means to know why.

As a practical design philosophy for life, Biologic Architecture presents and puts into practice the rules and pathways by which buildings become Fractal. The Golden Ratio/Phi-based harmonics optimize fractality because this unique geometry allows

all biological memory to be stored, distributed and radiated efficiently, which is the true meaning of sustainability. This geometry can be meaningfully described as the "electric flower shape" of perfect self organization, which gives rise to all growth, healing, awareness and attention – the basic attributes of any living system. Fractality concentrates the life force, and this invokes a profound feeling of our senses becoming alive.

I fully appreciate that this may all still sound a little contrived, but I ask you: How often have you had the opportunity to stand still in a truly sacred space? To just be and to feel what it is like to bathe in an infinite series of charge fields of energy all agreeing to center themselves in your very biology? We may have come close to this feeling whilst standing in an ancient stone circle or nested calmly in a grove of old growth oak trees, but seldom in a modern building.

Herein lies the solution to designing healthy, sustainable buildings. Compare how you feel in pristine Nature with how you feel in an electro-smog trapped building made of steel and aluminum – an environment which measurably inhibits all growth and attention. Life requires the opposite field effect and environment and so these spaces literally create death and disease. The feeling quality of such a space is distorted and lacks biological coherence. When the shapes of the land, the building itself, the spaces within, the elements and energy flows all become fractal in form, and the materials used are able to hold a living integrated charge field, then we have a sustainable "sacred" space.

By definition, the design of a living space must be exactly that – a space that is electrically alive, both in terms of shape and form and the materials used – a space where charge can breathe efficiently and achieve distributed resonance, which is fractal connectivity. Fractality creates the necessary energetic matrix that nourishes all biology.

Many of our modern squarish metal-based structures and spaces do the very opposite, in effect creating a fractionating electric field, which eventually disrupts and destroys biological function, including the human immune system. This happens because the very molecules of matter which make up the materials of these enclosures were not fused in wave phase or alignment with biology and, as such, cannot contribute to the desire of all living systems to share and distribute memory and information.

In essence, every time a particle, atom or molecule wishes to join the fractal fun club called living material, it must happily agree to become electrically rearranged into a fractal pattern, much like a rose opening. The tingling feeling of ecstasy, enthusiasm and inspiration we feel in a “sacred space” is actually the very efficient distribution of biological charge – a prerequisite for a healthy, sustainable life.

Building material, like food, can more effectively carry life force if it retains a Nature state as close to its living condition as possible. For instance, wood is a better conductor of biological charge than steel, and hardwoods are better than softwoods.

In terms of practical application, a designer can begin by developing a basic understanding of the underlying geometry of the Golden Ratio and its many generative forms and expressions and, indeed, how to do this by hand. I am not a Luddite, but I understand that there is a profound difference between actually drawing these geometries by hand on paper, using a compass, straight edge and pencil, and merely clicking a few buttons on a keyboard. The actual feeling and process of working by hand induces understanding in a way simply not possible using external technological means. It is also very useful to explore how Nature uses this magical ratio in the creation of living systems and how wisdom traditions in the past utilized it in the creation of magnificent spaces that support biological function.

Ultimately, the main thrust of this knowledge, science and art is a response to our innate desire to maximize expression of beauty and harmony whilst maintaining perfect and sustainable equilibrium with our environment.

*Michael Rice is an award winning architect and member of the Royal Institute of Architects of Ireland. He studied at the School of Architecture in University College Dublin. He set up his own practice in 1998 based in the Slieve Bloom Mountains in the heart of Ireland, specializing in Sacred Design and Living. He is kept wonderfully busy designing beautiful homes all over the world. He teaches “Sacred Geometry and Coherent Emotion” internationally and has gained a reputation as a dynamic and playfully enthusiastic presenter. He has travelled extensively and studied Architecture/Natural Design, Martial Arts, Science and Philosophy for over 25 years, bringing this understanding and practical experience to both his design work and his teachings. He lives with Heather and five amazing home educated kids, currently in the midst of finishing their new home “Dreamfield,” photos of which accompany this article and appear on the cover of this issue of Natural Life Magazine. - NL -*

## Five Reasons to Build A Bio Architecture House

1. Great Value for Money: Generally no more expensive (and in some cases cheaper) than a “normal” house of comparable footage. For instance, a curved wall uses less material and is structurally stronger than a straight wall, as well as providing wonderful opportunities for the exploration of new and in many cases cheaper finishes.

2. Healthy and Life Supporting: The forms, shapes and geometries used in a sacred geometry house, in association with good choices in siting, orientation, natural materials and building services, create environments which measurably support and enhance biological function – or in simple terms – support life, in terms of body, mind and spirit. These homes are a joy to live in, as testified to by numerous owners, many of whom no longer feel the need to get away on a holiday, preferring to stay at home in happy, healthy, light-filled sanctuary.

3. Energy Efficient: The design emphasis on maximizing solar alignments and minimizing leakage of energy, the effortless provision for smooth movement of people, light and heat, in addition to high levels of insulation, create homes that are easy to heat (and cool), efficient and flexible to run, and easy to maintain.

4. Timelessly Beautiful: My designs fully incorporate and integrate the pure geometric forms, proportions and patterns effortlessly expressed by Nature at every level. Our ability to behold, perceive and experience beauty and harmony arises from this primary creative impulse. As a result, these buildings are attractive, nest comfortably into their environments, and maintain an excellent resale value.

5. Flexible Design Potential: There are a multitude of design options and possibilities, from elegant and well proportioned rectangular homes, to homes that look as if they just landed from another world, or rose up and emerged from this one! Each design is complete and integral within its generating geometric matrix but, like any living organism, contains and maintains abundant opportunities for change and alteration to suit specific needs or environmental conditions. In addition, the hard and soft landscaping in and around the home can be directly informed by this same matrix, affording greater personal and individual creativity.



Author and architect Michael Rice

Heather Rice

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