

“Man is a sign of himself” C. S. Peirce

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Our lead article is by Chris Wilson, a psychotherapist who first worked with Kenneth Walker and John Bennett. He is currently working in a permaculture community and has been all his life a carpenter. He has studied the Gurdjieff laws of three and seven but also engaged with the methods of Eugene Gendlin (see left), a remarkable psychologist and philosopher, inventor of Focusing and Thinking at the Edge, concerned with making therapy effective and generating theory from ‘felt-sense’. In his essay, first written in 2004 but now updated, Chris brings the various strands together in a cogent and illuminating way. This is followed by Josph Azize’s article on the connection between blood and one of Gurdjieff’s remarkable inner exercises sometimes called ‘The Four Prophets’ and even ‘Conscious Stealing’. We proud to publish the main part of an article by acoustic engineer Dermot Furlong of Trinity College Dublin. This concerns the spatial phenomenology of sound, in particular music. Psycho-acoustics is a

new discipline. We conclude with some speculations by a scientist from Kazakhstan on the possibility that alien intelligence coded our DNA. The coincidence that this idea is based on the number 37 was too much to ignore!

## GENDLIN AND THE ENNEAGRAM

**Chris Wilson**

### *Introduction*

**Focusing** is a practice developed by American philosopher Gene Gendlin in the late 60’s as a result of his studies into the link between *experiencing* and the creation of *meaning*. I started learning about it 15 years ago, initially with Lesley Wilson who is a Biospiritual teacher in the U.K. and subsequently with Barbara McGavin. I have had several hundred 1-to-1 sessions with many different Focusing partners, and I used it as a key part of my practise as a psychotherapist. It made a profound impression on me as a way of exploring inner relationships, both for myself and for my clients.

In common with many Focusers, I see it as partly therapeutic, and partly a kind of spiritual practice. It has its feet on the ground, in our ordinary, mundane reality, but it also reaches deep inside to our innermost heart. The ‘spiritual dimension’ of Focusing has been emphasised by many writers, such as John Welwood, Neil Friedman, and by Ed McMahon and Peter Campbell, the founders of Biospirituality. I used to meet regularly with Dom Sebastian Moore at Downside Abbey, and in our talks we constantly returned to Focusing as a key link between the practice of contemplative prayer, or meditation, and our experience of ourselves as vulnerable and emotionally wounded human beings.

All this made me wonder whether the practice of Focusing could be described from the point of view of the intriguing psycho-spiritual symbol known as the Enneagram, and if so, whether we could learn anything new from it.

**The Enneagram** has become widely known as the symbol behind the nine-fold classification of psychological types, developed originally by Ichazo and Naranjo and popularised by Helen Palmer. Readers of Palmer's book will know that it first appeared in the West in Ouspensky's accounts of the "system" of G. I. Gurdjieff, where it was described as "an ancient Sufi symbol". My interest is not so much in Naranjo's typology as in the original purpose of the symbol. I worked for several years with J G Bennett, the most independent and penetrating interpreter of Gurdjieff's "system", so I was familiar with many of the basic ideas. But I hadn't worked directly with the Enneagram before, and I hadn't realized that it demands a completely different way of thinking. Our normal, manipulative, logical thought won't work with it. I had to resist the temptation to reduce the symbol to something more familiar. I had to suspend judgement, to plunge into the heart of it *and stay there* until it acquired enough "body" to live its own life through my thinking.

In this important respect, working with the Enneagram is similar to what Focusers call 'Thinking at the Edge'. In other respects, it is very different. The Enneagram is part of a long tradition of esoteric ideas, handed down by spiritual teachers whose students do not, on the whole, question their authority. My own experience of the Gurdjieff groups in London nearly 50 years ago was about effort, discipline and hierarchy. Gurdjieff's work is theoretically dense, esoteric, and complicated. The aim is to acquire a deep understanding of the Universal Process, but experience is used on the whole more to validate theory than to generate it. Gurdjieff and Bennett developed their ideas in the context of groups of people who dedicated themselves to what they called "The Work", and I need to start by giving a little background on both of these men.

### ***Gurdjieff and Bennett***

G. I. Gurdjieff set up his 'Institute for the Harmonious Development of Man' in France in the 1920s. He was born in the Turkish city of Kars in 1866, and died in Paris in 1949. He was an enigmatic and forceful man whose ideas, although far from the Western mainstream, influenced many people and anticipated by half a century some of the psychological and ecological ideas current today. He didn't actually say very much about the Enneagram, because he judged that people would just become excited about it and use it as a talking-shop. Instead, he developed a whole corpus of complicated "temple dances" based upon it, and insisted that his students spend long hours learning and perfecting them, on the grounds that the Enneagram had to be experienced in the body and the feelings before it could be thought about in the head.

The Enneagram is the key to his spiritual psychology, but it was so far from the main stream of Western thought that people had to be "freed up" before they could really take it in. He made various radical assertions about human behaviour, mostly negative ones, and insisted that his students test these assertions by rigorous and unremitting self-observation. During his lifetime there was no "gentle" way of helping people to gain some direct experience of their inner dynamics. There was no technique comparable to Focusing, because the conditions for it didn't yet exist. His solution was to make impossible demands on his students, in effect forcing them to break through their conditioning. Some had the courage and tenacity to succeed, but many of them suffered dreadfully in the process, and there was a tendency for some of them to develop a quasi-religious fundamentalism, taking his negative assertions too literally and developing a very harsh 'Inner Critic'. Some people (for example, Anthony Storr in *Feet of Clay*) are convinced that

he was a dangerous charlatan. I'm convinced that he wasn't a charlatan, although at times he did make people feel intensely uncomfortable.

For the purposes of this study, I will be drawing particular attention to two of the ideas that he introduced in his writings. One is the "Law of Three", which states that every transformative process in the Universe has to have three independent sources. For example, 'understanding' is not just a mental process but depends equally on thinking, feeling, and sensing. The other is the "Law of Seven", which states that every process of transformation takes seven separate and distinct stages (or sub-processes) to be brought to completion. More on this later.

There are numerous websites devoted in one way or another to Gurdjieff's ideas, where more information can be obtained. There are also many books, some of which are listed at the end.

J. G. Bennett (d.1974) was one of Gurdjieff's foremost students, who developed the science of Structure which he called Systematics. Bennett was a very different man from Gurdjieff, and he wasn't a typical 'disciple' either. The teachers I knew in the early 60s at the Gurdjieff Institute in London thought he was a maverick, because he didn't stick to the accepted script. Instead, he made links with many other traditions, including Sufi groups in Turkey who, I found out later, still regard him as an important teacher. He paid particular attention to the Enneagram; in fact he designed and built a large study-house in the grounds of his Institute in Kingston, England, whose geometry was based on it. I worked with him for about 10 years, 5 of them as part of a team which was researching ways of using Systematics in the production of educational text books. We wanted to design study units which could communicate ambiguous and difficult material in a way that helped the students to make their own judgements, rather than learning it like parrots so that they could regurgitate the stuff for their exams.

One of my former colleagues in the Kingston group has since written a comprehensive account of the Enneagram (*The Intelligent Enneagram* by A. G. E. Blake, Shambhala, 1996) which makes it much more available for study than it has been hitherto. So far as I know, this account is unique. Millions of words have been written about the Enneagram of psychological types, but no-one else has published an account of the symbol itself in such depth. I have relied heavily on his work in doing this study, so I want to start by acknowledging my indebtedness to him. (There is more information about Blake, and the organisation called the DuVersity which he co-founded, on [www.duversity.org](http://www.duversity.org).)

The Enneagram is an extraordinarily versatile and powerful tool for understanding any *process of transformation*, from something as simple as drinking a glass of water to something as complex as the evolution of the biosphere. However, as I said earlier, it demands a very different way of thinking. It demands that we "think" *with the whole of ourselves* – not just our heads, but our bodies and feelings as well. Moreover, the Enneagram needs to be understood *from the point of view of the whole*, rather than piece by piece as if it were a kind of algorithm. I found that I needed to take time to *savour* the ideas – to let go of my urgent need for 'instant understanding'. I found that my worst enemy is my constant need to feel that I'm in control. Perhaps this is the fatal flaw with what we call "common sense". It wants to reduce this beautiful, awesomely complex, dangerous world to something which we can – at least in theory – bring "under control".

### ***Three key attributes of Focusing***

For the purposes of this study, I would like to draw attention to three key attributes of Focusing as a process:

(1) It is **intentional**; that is, it is initiated and "held together" by the will of the Focuser (and if he or she wants it, the help of the Companion). We don't do it frivolously, because we trust that

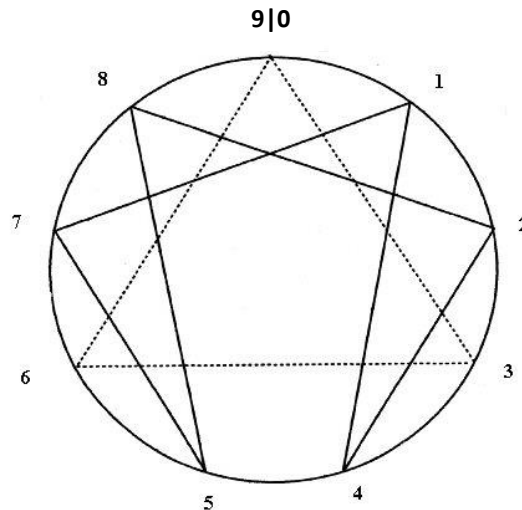
it might teach us something valuable about ourselves and our situation. We trust the process, and respect what it reveals to us.

(2) It is **transformative**; that is, it starts with a state of "pregnant chaos", it allows the felt sense to unfold itself and metamorphose as it will, and it proceeds until the intelligence enfolded within the felt sense is made available in a recognisable or usable form. We could say that when we do some Focusing, we end up in a higher state of *order* than when we started. After a good Focusing session, we may feel this as a deep sense of relief, a new understanding of ourselves, or an expanded view of our world.

(3) It is **iterative**; that is, the small steps of the process are not linear, but rely on a "forwards and backwards" movement between *felt sense* and *meaning*, during which the outcome is progressively re-shaped and refined. These iterations allow us to **bring together** two entirely different worlds – the irrational, intricate, personal world of the felt sense, and the rational, ordered, shared world of Meaning – and allow each to penetrate the other in such a way that new understandings can be created.

These key attributes embody all the main features of the Enneagram, and they show that Focusing can in principle be "mapped" directly onto the symbol, which is the purpose of this study.

**The Enneagram**



The dynamic of the Enneagram is based on the mutual interaction of three structures. The first is the circle, which goes right around the outside. The second is based on the number 3, which appears as the *triad* joining points 3, 6 and 9 (see diagram). The third is based on the number 7, which appears in the *hexad* 1 - 4 - 2 - 8 - 5 - 7. How are these 6 points associated with the number 7? Because this sequence of six numbers, in the same order, appears in the recurring decimals for any *seventh part*. Thus 1/7 is 0.142857142.....

2/7 is	0.285714285.....
3/7 is	0.428571428.....
4/7 is	0.571428571.....
5/7 is	0.714285714.....
and 6/7 is	0.857142857....

**The Circle**

The circle represents wholeness, completion, the monad, what Gendlin calls "that whole thing".

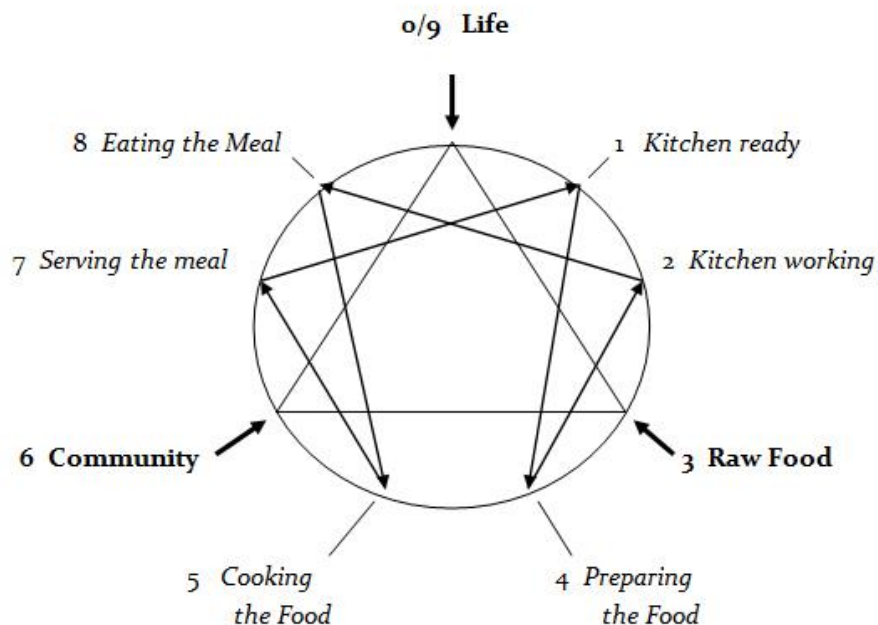
Broadly speaking, when "that whole thing" goes through a process of transformation, what we see happening *from the outside* follows the number sequence on the outside of the circle, from 0 to 9. Thus, the circle can also represent the "outsider's view" of the whole process, the view of the person who keeps a diary of events in the order they happened. He doesn't have to understand how the process is put together; he just sees one step following from another. An often-quoted example of a complete process on the Enneagram, which J G Bennett used in Vol 3 of his masterwork, *The Dramatic Universe*, is given by the sequence of events in a restaurant (see diagram below). The outside observer would see the whole process begin when the kitchen staff come in for work (point 1), and he could follow it through until the last satisfied customer went home (point 9).

### *The 6 Inner Lines*

For the kitchen staff themselves, what they experience "on the inside" may be quite different. The outside observer can't see what's actually going on in their heads as they work – that is, he can't always see the inner logic of it. But the staff, on the inside, have to continually adjust the process and adapt it as they go along. It doesn't just go by itself, automatically. The process is both causal (ie. built on the past) and purposive (ie. pulled into the future.) The causal part means that what they're doing now has to rest on what they've done already. For example, before they cook vegetables, they have to prepare them. On the other hand, they don't just prepare any old vegetables at random. Their preparation is *informed* by how they want the meal to turn out eventually. They have to keep "consulting the future", comparing what they're doing now to what they want to achieve several steps down the line. So those who are engaged in the process experience it both as a sequence of linear steps, and also as a sequence of forwards-and-backwards *iterations* as they make all the necessary judgements about how to do the work. The inner logic of these iterations is represented in the Enneagram by the hexad 1-4-2-8-5-7.

The next diagram is similar to that used by J G Bennett to show how the complete workings of a community kitchen can be mapped onto the Enneagram. (*Enneagram Studies*, 1983 edition, chapter 8). In this case, the steps all correspond to observable situations or actions, so they are relatively easy to understand. In the case of a Focusing session, the internal logic is much less apparent, but it will help us to get to grips with it later if we first take a look at something more clearly differentiated.

The form of the Focusing process is also iterative. We spend some time attending to a felt sense, then we seek some kind of symbol for it (usually in words and/or images), then we refer back to the felt sense again to see if our symbol really 'resonates' with it. If the symbol doesn't fit very well, there is usually some indication of what might be closer, and the process starts over. When the symbol finally "fits", it's fairly obvious, because the felt sense 'moves forward', as if the symbolisation enabled it to unfold. Now the new felt sense calls for a new symbol.... And so on, until we reach a point where it feels like we've done enough for now. So there are iterations, as is the case with any process that moves forward towards a greater degree of order.



Some may object that in Focusing we don't have a clear aim in mind, like we do when we're doing something practical like cooking a meal. It seems to me that this is only partly true. We certainly don't know what the *content* will turn out to be. As Gendlin says, we may be able to follow it logically backwards, after the event, but we don't know it in advance. On the other hand, we do have the *intention* of working towards a greater clarity of understanding. Our overall aim is towards wholeness. We are engaged in "soul-making", which is perhaps the most significant activity we can undertake as human beings.

The actual process of studying the Enneagram itself relies on iteration. There is no way it can be understood in a linear way, by breaking it down into pieces and understanding the pieces one by one. It only ever makes sense as a whole, even though when we start out, the 'whole' that we see may be a bit sketchy. Fortunately, this doesn't matter, because whatever route we take, the 'whole' we arrive at can be (in fact, must be) broken down and re-apprehended over and over again. This only became clear to me after I had been trying for months to make sense of it in the usual way, by logical steps. In this respect, studying the Enneagram is like studying that old favourite, the 'meaning of Life'. In the end we find that there is no single, correct understanding of it. What we find instead is an irreducibly complex wholeness with which each of us can only engage according to our own irreducibly complex individuality. Before I took up Focusing, I might have found this idea quite worrisome, but for some reason I now find it very satisfying.

The number seven represents an ancient system which combines *completeness* with *progression*. It is demonstrated (for example) in the scale of the octave in music, which undergoes seven steps from the lower "Do" (on the traditional do-re-mi-fa system) to the upper "Do", and then starts over at double the frequency. The Periodic Table of the Elements in chemistry is another example. The seven traditional colours of the spectrum, the seven days of the week, and the seven pre-Uranian planets of traditional astrology are all related to the same system.

However, this doesn't always translate into an exact match, like the match between an equation and a phenomenon in Physics. For example, there are many ways of dividing up the musical octave to obtain the 7 intermediate notes, and you can even do it with 6 (as in the whole

tone scale often used by the French composer Debussy) or 12 (as in atonal music). The number 7 points to a structure which lies behind the phenomena we observe, which is not the same as saying that there are always just seven observable steps in a process. We may only be able to distinguish three, or we may find 17, or 70, but the enneagram is saying that if we're looking at a complete process, we will find hidden behind these observable steps a definite inner "sevenfoldness", which will be exemplified to some degree in the actual steps we see.

Now we can take some time to explore in more depth the central figure of the Enneagram, which is the triad.

### ***Threefoldness***

The triad is perhaps the most subtle part of the symbol to understand. In one sense, it is the "structure of intentionality" that holds the whole Enneagram together. In another sense, it represents the three separate and independent sources which are needed to initiate the process of the Enneagram, to keep it on track, and finally to bring it to fruition. In itself, the triad is a symbol for what we might call "the threefoldness of every process". We'll approach this in a direct, experiential way somewhat further down the line, but first I would like to introduce it in terms of J G Bennett's 'Triad of Experience'. This is a fundamental philosophical construct, not unlike the ancient Chinese triad of *yin*, *yang* and *Tao*.

Bennett's core philosophy, which owes a great deal to Gurdjieff but re-casts the ideas in a form which is more acceptable to Western philosophical thought, is contained in his cosmological treatise *The Dramatic Universe*, published in four volumes between 1956 and 1966. The Triad of Experience is first introduced in Volume 1, pp 54-68:

"Experience itself is not homogenous: it has elements differing in their essential nature – namely, the elements of **function**, of **being**, and of **will**. All three elements must enter into any possible experience...." (This is equivalent to saying that Bennett's phenomenology of experiencing has 3 fundamental or irreducible terms).

"We can define the term function as 'the knowable element in experience' ... it is concerned with what goes on in time and space." Key words for Function include concepts like fact, causality, logic, separateness, body, touch. Science thinks almost exclusively in terms of function.

"Being ... is equally pervasive with function but entirely distinct. ... Being concerns the **status** of our experience ..." We may speak of 'gradations of Being'; for example, a stone has less Being than a bug, a bug has less than a cat, and we might say that a cat has less than an angel. Bennett defined Being as "Intensity of Inner-Togetherness". A state of creative activity has more Being in it than a state of sleep. A higher state of Being has available to it more degrees of freedom than a lower state. It is also associated with a different kind of Time, which Bennett called 'Eternity'. People who have experienced 'timeless' states, for example in meditation or while listening to sacred music, will have some idea what this means. Key words for Being include concepts like value, complexity, togetherness, wholeness.

Will is very difficult to characterise in words. For example, Bennett wrote of "will as the urge inherent in everything towards its self-realization", but what we would call "urge" or "motivation" is only one aspect of it. Will is present in the way we try to influence events towards a preferred outcome, but it's also present in the way a crystal forms out of a supersaturated solution. It's present in autopoiesis, the word coined by Varela for the tendency of biological systems to become more complex "all by themselves". It's also present in the wish of the Christian contemplative for union with Christ, which he is absolutely powerless to bring about himself. He can only have faith in God's grace and try to get his own ego out of the way.

Here is another excerpt from Bennett's writing which gives a different angle on function, being and will. This is also from *Enneagram Studies*:

"Man has three different natures to be complete: there is his *bodily* nature" [this is equivalent to Function], "there is his *will* or spiritual nature and there is his *being* or soul nature. ... In the true Man, body, soul and spirit are present together like the three parts of cooking a meal. The body compares with the kitchen, the soul compares with the meal, the spirit or will compares with the people who do the cooking... I use the words will and spirit as meaning the same thing." In this excerpt, Bennett shows how his Triad of Experience translates into a complete picture of a three-fold human nature. Broadly speaking, Gurdjieff and Bennett saw human beings as complete in body and spirit, but lacking in the 'soul' as the essential link between them. The purpose of our lives, they said, is to *make our own soul* by effort, study, service to others, and contemplation or prayer. Soul then becomes the vehicle for Spirit, or the intermediary between Spirit and Body.

The subject of three-ness on this kind of philosophical level could obviously take up a lot of our time, but I wanted to just give a flavour of it here, to show how it isn't just an arbitrary idea. But I also want to avoid getting too concept-heavy, so I'll start down the trail where we all start, which is with our ordinary everyday experience.

### ***Thinking in Twos***

Our normal "common sense thinking" is based on a 2-term logic. We assign things (or concepts, which are a kind of mental "thing") into categories, so that we can distinguish between like and unlike, inside and outside, "A" and "Not-A", etc. We might call this an 'either-or' logic. It is also the logic of linear time – before and after, cause and effect, action and reaction. Such binary pairs fit very well with the form of our subject-predicate language. They belong to what Bennett called the world of Function.

The whole of Classical Physics is based on this binary logic. For example, the standard image for helping us to understand Newton's Laws of Motion is of an innocent billiard ball rolling along, minding its own business, until another one collides with it and they both fly off in different directions. The collision is treated as a simple case of action and reaction, which can be fully described by a set of mathematical equations. To relate these equations to reality, various assumptions have to be made – the balls are perfectly elastic, there is no friction, etc. Such a binary logic sees reality 'from the outside', and always in an idealised way. Classical Physics is replete with images of spherical objects interacting with each other in a curiously genteel and predictable manner on every scale, from the atomic to the galactic.

What would a 3-term logic be like? Bennett called it the logic of **relatedness**. This can be seen more clearly when we look at a process as if we were experiencing it *from the inside*. To some extent, we have to BE it instead of just thinking it. For a rigorous 2-term logic, this might look dangerously subjective, because it can't be reduced to an algorithm. So why bother with it? One answer is, because it gives us a more organic sense of a situation, and it leads to a more holistic kind of understanding. Through the eyes of this logic, we can begin to appreciate the paradox by which free will can operate in a world that science, at the same time, understands as thoroughly deterministic. Through the eyes of this logic, the world looks hazardous and uncertain, always in flux, never fixed. Other, much more significant advantages follow, as I hope to show.

As an opener, we might ask how two colliding billiard balls might relate to each other in 3-term logic. This is a rather trivial example, and doesn't show its full potential, but it is interesting to ask the question anyhow and see what comes up. The answer must involve the 'between'



rather than the 'before' and 'after'. What happens *between* them? Looking at such a collision "from the inside", we find that it is much more complex and subtle than the classical formula supposes. High speed photography would show that it takes a finite time for the energies to be transferred, for elastic distortions to happen, for the balls to change their speed and direction, and so on. We could then argue that there is an unseen 'third force', hidden in the geometry of the setup and the internal structure of the billiard balls themselves. This is the 'third term' in the logic, without which the event would not be able to happen. It constitutes everything that *mediates* the process.

The fact that both classical science and "common sense" see phenomena in terms of twos rather than threes is a result of the way we think about them, not of the phenomena themselves. A 2-term logic is reliable, mechanical, and closed, and for most predictive purposes, it works. It *reduces the world* to manageable proportions. As soon as we introduce a third term, there is a degree of uncertainty and we have to start looking at phenomena in depth, qualitatively. The Focusing-related practice known as Thinking at the Edge (TAE) does the same thing, by taking a paradox and 'bending' it until pathways between the opposites can be found and explored. It does this in the same way, too, by 'staying with' the paradox and subjecting it to a different kind of (non-logical, feeling/sensing) process.

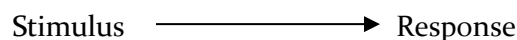
It's perhaps not surprising that any '3rd term' should be ignored in the formulae of classical mechanics, because the mathematics of it would be fiendishly difficult to work out, and for most practical purposes, would make no difference anyway. A triadic analysis of a simple mechanical event such as a billiard-ball collision adds very little of significance to our normal dyadic understanding of the event. With human events, the triadic analysis acquires much more significance. Let us now look at human interactions as seen in these two different ways.

### ***Human psychology as a 2-term logic***

2-term logic tells us that like any other living thing, we are beings who *react to stimuli*. Of course, this isn't all that we are, but it's often how we behave, especially when we're just reacting by habit to situations where we know what usually happens. The science of behaviourism, which was the "only show in town" in American psychology for several decades, tried unsuccessfully to cram everything into this rather mean little box.

Our habitual routines can be quite sophisticated, so that we can handle complex tasks, like driving in heavy traffic – as long as we recognise the situation as being familiar. This tendency to reduce everything to the level of a habit is deeply embedded in the neurological structure of the brain. It saves us an enormous amount of energy and time in the business of living.

Stimulus and Response are the same as Action and Reaction in Physics. Reacting to a stimulus can be seen, from the outside, as a process based on the number 2.



When we react to a situation, Focusers would say that we are coming from an *implicit body sense*. Normally, we don't need to give it the space or the time to unfold into awareness. Instead, it moves forward directly into action. We are aware of it only from the outside. To get a feel for this, you could picture yourself driving along the main road. A pedestrian steps out into the road some way ahead of you, and your foot moves automatically to the brake. You don't think "Ah! A pedestrian. I must apply the brake." You may be unaware of any internal process at all. But your

body knows instantly what to do (Stimulus – Response). If the pedestrian steps out without warning just in front of you, there may be a very strong reaction in which a lot of energy is discharged, but what it *comes down to* can still be seen as Stimulus – Response.

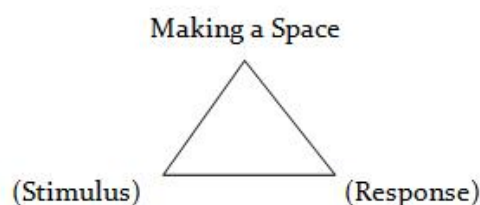
### ***Human psychology as 3-term logic: Self-awareness***

We can be self-aware. But our self-awareness isn't automatic. It isn't a response to a stimulus, as classically understood. Beyond a certain point, we have to *cultivate* self-awareness, which means we have to provide the right conditions for it to grow. Cultivating self-awareness is not the same as learning 'Life Skills', which may help us to become highly aware in some specialised way, but not necessarily in a balanced, body-based, grounded way.... *As I write these words, I become aware of myself, and realise that my entire functioning is trapped in some kind of abstract word-space. I take a moment to sit back and come into my body....* It's a gloomy, damp Sunday afternoon in November. My neck is stiff, my eyes hurt, and my belly is full of lunch. I hear the sound of words running around in my head like frantic mice trapped in a maze. The task ahead is daunting. I have a sense of 'daunting' in my neck and shoulders.... Now it eases a little, and I notice the amazing, vibrant magenta flowers on the Christmas cactus over there on the window sill.

Gurdjieff often observed that we "average human beings" spend most of our "waking life" in a state which isn't far off sleep. Sometimes a difficult challenge will "wake us up", but in a situation where we feel threatened it's more likely that our self-awareness will just disappear altogether. We "freeze" inside, our habits take over, and we get behind our defences so fast that we don't realize what we've done until afterwards. A psychologist might say that we react 'unconsciously', or that we are 'ruled by the unconscious'. A neurophysiologist might say that the perceived threat triggers the autonomic nervous system into a 'fight-or-flight' response which immediately focuses the awareness on that alone, and closes every other system down.

I can get a body sense of this by calling to mind some recent event where I had a strong reaction to another person's behaviour. Suppose I Focus on that situation which upset me yesterday.... As I go inside, I represent the situation imaginatively, and I *notice what happens in my body*. Maybe I sense something in a particular place. Then I *make a space for it to unfold....* This allows yesterday's strong reaction to 'be there' in the larger context of a deliberately cultivated self-awareness.

This 'coming into oneself', this 'making a space', is what it feels like to go from the '2' to the '3'. I stop tapping feverishly at the keyboard, sit back, and make a space. If I merely *think about* the upsetting event that happened yesterday, as if I were looking at myself in a movie, I'm still in the '2'. As soon as I place myself "inside" the experience, holding it in my awareness, I've moved into the '3'. It's as if I took the line between "Stimulus" and "Response" and added a third point, making a triangle, which has some space inside it.



It's worth dwelling on this for a few moments, to savour the difference between the two. This isn't a mental trick, it can be fully experienced in our bodies. We distinguish the '3' from the '2' because it feels qualitatively different. In the '2', there is no space – just reaction. In the '3', we

slow down, make a space, and begin to inhabit ourselves properly. It's as if we have introduced some kind of 'third force' into an equation which normally only has 2 terms. Some Focusers call this *being in Presence*.

### ***A Mediating Space***

Mediation is a common role for a 'third force'. A clear example of this is the peace process in a major dispute. The mediator has a neutral role. He or she can help each of the disputants to see the situation from the others' point of view. He makes a space for them, and this makes it possible for each of them to make a space for the other. When they were combatants, there was no option but for one of them to win, or they got into a stalemate where nothing could change. When they accepted mediation, they moved from being combatants to parties in a negotiation.

Mediation can take place internally as well as externally. For example, suppose I receive an insult, to which I react by getting angry and shouting back. In the heat of the moment, I don't notice the feeling of hurt which probably lies underneath the anger. I don't notice the inner habit by which this hurt is picked up by another part of myself, which immediately throws it back again in an effort to damage the person who insulted me, and to get rid of the bad stuff inside. What I "see", what I represent to myself, is a picture of him (we'll assume it's a 'him') as being rude or insensitive, a "bad person". If he is a bad person, then it follows that he wants to do me harm, so therefore I must either become a victim, or a strong person who won't allow himself to be beaten. That's my "blind" 2-term logic speaking. I have simply identified myself with one or other of my "inner figures". Later, if I Focus on the incident, the inner dynamic might unfold for me so that I get to see how my response was mediated. I might begin to explore the hurt part and allow it some space inside. I might see how the angry part needs to destroy the other person in imagination, because it "thinks" that this will somehow protect me from further damage. In my Focusing *experience* of all this, I am going from the '2' to the '3'. As with Newton's billiard balls, the third force was always present, but it was "hidden". When we simply react, we just aren't conscious enough to see what's going on inside. But when we make a space for it, the hidden '3' can become conscious, which allows our frozen process to unfold and move on a little.

Mediation can take place during the insult, instead of afterwards. Suppose you receive an insult, but manage to remain *in Presence*. (By "in Presence", I mean that you remain grounded in the present moment through a substantial bodily awareness). You might still feel some hurt and anger inside, but instead of being pulled into it and reacting, you might just notice it and make an assessment. This gives you many more options than the automatic reaction, which is always highly stereotyped because it's based on habit, not judgement. Also, the energies in your body don't need to re-balance themselves automatically by throwing the insult back at the insulter. Instead of shouting back at him, you might say (for example) that you appreciate how something you've done might have made him angry, but that you didn't do it with that intention. In other words, you can *consciously* take in (make a space for) the anger and the hurt on both sides, which helps both of you to transform them into some kind of mutual understanding. You have your own internal mediator, at least for now. The key to this seems to lie in being able to maintain a substantial bodily awareness. For most of us, this isn't an easy option.

### ***Gurdjieff's "Law of Three"***

Gurdjieff's psycho-spiritual ideas rely a great deal on what he called the Law of Three. He said that any process of transformation requires three independent forces (inputs, sources, terms), which can be designated by such words as active, passive and neutral, or affirming, denying and

reconciling. We have talked about a 3-term logic in terms of 'relatedness', but Transformation is a much stronger idea. It implies a relationship, but it also implies a direction and a result.

The simplest expression of Gurdjieff's Law of Three is something like "The higher acts on the lower to produce the middle". Earlier I mentioned Bennett's triad of Body, Soul and Spirit. In this case we would say something like "Spirit acts on Body to produce Soul". Or we could say "Body calls on Spirit to help it produce Soul", which is what may happen in Focusing.

Lets' see how it looks if we apply this to the process of writing this essay. The 'higher' comes from my engagement with these original ideas. They are the real source of order here, so my *wish* to engage with them might be the 'active' term in the triad. The 'lower' is what I bring to the task, including whatever intelligence, experience and verbal skills I can muster. Psychologically speaking, this is the 'material to be ordered', the 'receptive' term in the triad. The 'middle' will be the essay itself as an instrument for communication, and hopefully, the beginning of further work. Here, doing the essay mediates the task of engaging seriously with the ideas, and is also a 'result' in its own right. It acts as the 'reconciling' or 'third force', which makes the task holistic rather than linear, giving it 'presence' enough to make an impression in the body and the feelings rather than just the head.

As a concept, the triad is surprisingly slippery and difficult to nail down. Each term is only what it is through its relationship with the other two. If we take each one separately, as if it was a *thing* which we were putting together with two other *things*, we lose the essential nature of the triad as a symbol of relatedness. For example, the Family (Father – Mother – Child) is often cited as an example of a Triad. In the archetypal family triad, we have Father in 'active' or 1st place, Mother in 'receptive' or 2nd, and Child in 'reconciling' or 3rd. But there are many situations in which the roles are different. For example, in baby care the mother may occupy the 'active' role and the father the 'reconciling' role (that is, if he's involved at all.) And in many situations, the three of them don't have enough 'inner togetherness' to act as a proper triad. In its operation the triad is fluid rather than fixed, depending on the actual situation and the particular process under examination. There are what you might call "Cosmic Triads", like Bennett's Triad of Experience mentioned earlier, but the triad itself isn't confined to archetypal situations or fixed values.

Going back to the triad of writing this essay, there are different ways of specifying this also. For example, when I'm editing the work, I encourage the essay itself to occupy 1st place. This is like putting myself in the position of the 'innocent reader', and it helps me to see where the writing is a bit clunky, or fails to communicate the subject matter (but not always, alas, how to do it better).

I have mentioned the "Law of Three" in human beings with respect to two situations so far: Focusing, and writing this essay. These have quite a lot in common, because I constantly find myself checking with my body to see if the words really convey my sense of the experiences to which I'm referring. But if there is a Law of Three, what do we mean? Three of what? I mentioned earlier how Bennett translated his Triad of Experience into the image of a three-part human nature. Is there anything similar here, or just an abstract principle of three-ness?

### ***"Three-brained beings"***

Gurdjieff's reply might be, a bit of both. Throughout his 3-volume cosmological work, *All and Everything: Beelzebub's Tales to his Grandson* (Gurdjieff, 1950) he refers to humans as "Three-brained beings", as if we possessed a separate head-brain, body-brain and "feeling brain". By "head-brain" he meant our capacity to think, that is, to make mental representations and generate meaningful patterns, either in images or words. By "body-brain" he meant our capacity to act,

including all our sensory-motor responses. By "feeling brain" he meant, broadly speaking, our capacity to evaluate, to see or sense what is significant for us – and above all to mediate, tolerate, or bear psychic strain.

This triad of "brains" is related to, but not identical with, Bennett's triad of human natures which I mentioned earlier (spirit, soul and body). The head brain is obviously not the same as the spirit, and the feeling brain is not the same as the soul. But there is a sense in which the head brain can represent Spirit – not in our everyday cogitations, but more in the higher functions which Rudolf Steiner called 'Imagination' and 'Inspiration'. Likewise, the feeling brain can represent Soul – not in its emotional reactions, but in its capacity to bear psychic pain, to contain opposites, and to 'feel out' what is most true and valuable in our lives.

The triad of "brains" is not based on a physiologically watertight division. The three different capacities arise out of the same nervous and endocrine system. The head brain is continuous with the "body brain" through the brain stem and the spinal cord, and with the "feeling brain" through the autonomic nervous system. (see Damasio, *Descartes's Error*, 2000). Each "brain" uses the same mechanisms – the same nerve pathways, and the same neurotransmitters, for example. When Gurdjieff spoke about them, more than 50 years ago, very little was known about the science of neurobiology. He was pointing to the faculties we live through rather than the organs which make these faculties possible.

How does this apply to Focusing? I see it like this:

*"Body Brain"*: When we Focus, we could say that we are using the "body brain" in a receptive rather than active mode. Our capacity to *sense* a situation has evolved over millions of years. The human body is an exquisitely balanced adaptive mechanism, intensely alive to every nuance of its environment. Neurological studies have shown that if we imagine ourselves into a situation, the brain can produce much the same patterns as if we were actually, physically there. These patterns include a definite set of sensory-motor expectations, which prime us to respond as if our body is already in the situation, ready for action. In Focusing, we take this intricate, evaluative body response and use it as the basis for a period of sustained attention. By "body response" I don't mean the same as "felt sense", but I'm suggesting that the felt sense is grounded in (arises out of, depends upon) this kind of bodily response.

*"Feeling Brain"*: Normally we might not notice the felt sense, or we might suppress it because something else in us thinks it's a nuisance, or we might react unconsciously to it in some other way. In Focusing, we first of all *notice* the felt sense and then, suspending all action, we let it "be there", attending to it in a kind of interested, caring way. *This is where the "feeling brain" is fully engaged*, in its developed mode of "feeling-into" rather than reacting, circling rather than aiming, "being with" rather than interrogating. Perhaps this way of 'holding' the felt sense is best expressed by the word compassion ('feeling-with'). In the Biospiritual tradition, this way of understanding the process is made more explicit. This also says something about the link between Feeling and Soul.

*"Head Brain"*: Supported by this compassionate attention, we are alert for a word or an image from the "head brain" which will resonate with this specific but not-yet-articulated sense of things. When it comes, this will suddenly bring it into focus and give it existential depth. At this moment of resonating, we move into a "three-in-one mode" of consciousness. There is a living harmony between what we are sensing, what we are feeling, and what we are thinking or imagining. The moment expands, taking on meaning and significance. We move on, but we are also subtly changed.

We could picture the resonant word or image as coming from the direction of Spirit or Will, through our mental capacity to verbalise or visualise. We become that little bit more "joined up", in other words, more *whole*. Gurdjieff would have said that "wholeness" has a character of being "one-in-three". To become One, we have to develop a kind of harmonious Three-ness.

### ***What are "feelings" anyway?***

An interesting aspect of this analysis is that it shows the "feeling brain" as working in two ways at once. There are feelings present as part of the felt sense ('something in me feels tired, fed up, miserable', etc.). But the feeling function is also working in its developed or active sense in the 'compassionate observer', which has a definite Soul quality (as in 'keeping it company'). This is explicitly acknowledged in the McMahon-Campbell approach, in which difficult or unwanted feelings are embraced by what they call "Caring Feeling Presence". Other teachers prefer a Presence which is less 'Caring Feeling' and more like 'bare attention'. This makes it look more like mindfulness meditation, which isn't quite the same thing (see Welwood, *Towards a Psychology of Awakening*, 2000).

We saw earlier that the three "brains" are not divided from each other by hard-and-fast physiological boundaries. A different, and in some respects more useful, way of talking about these "brains" is to say, as Bennett did, that there are three different *kinds of energy* involved. This puts the emphasis more on our actual experience than on a quasi-physiological fiction.

The Focusing world has adopted a slightly different viewpoint about feelings. There is an unclear edge between 'feeling' and 'sensing', but both of these are clearly distinguished from 'thinking'. For example Welwood (1983), in his essay *Befriending Emotion*, describes a scale or "spectrum of felt energy" with *basic aliveness* at the bottom, then *felt senses*, then *feelings* and finally *emotions* at the top. At one end of the spectrum, "All our feelings ... grow out of [our] basic aliveness". At the other end, "Emotions are more intense forms of feelings" (p.80).

There is no generally agreed way of defining the words 'emotion' and 'feeling'. Personally I would prefer to use 'emotions' to refer to those feelings which, because they are strong enough to be noticed, are also culturally recognised and therefore named, like fear and anger. They can be named because they are "close to thought", that is, we can categorise them, which means we can put them into some kind of logical (causal) framework. Psychotherapists find that people become very anxious if they can't see an obvious cause for their feelings, eg. if they suffer from a kind of "nameless dread". One of the strengths of a psychoanalytic way of working is that it helps people to see how some event or set of conditions in their childhood may have "caused" their emotional difficulties.

I would argue that Welwood's "spectrum of felt energy" is really part of a triadic structure, which he has simplified by placing it on a linear scale. Feelings certainly *look as if* they grow out of 'basic aliveness' at one end of the scale, and they can also be "close to thought" at the other. But feelings, in themselves, are neither sensations nor thoughts. I think it's more useful to see them as simply a different kind of energy, one which can *mediate between* sensation and thought. Thus on the one hand, they are blended with sensation in what we call felt senses, or "sensations with added significance", and on the other hand, they blend with thought to produce a powerful image or idea. This "dual" nature of the feelings allows them to play the role of mediator, catalyst, or attunement medium. In fact, I think we can see them as the "hidden" third force in us, which is maybe why they are so elusive and difficult to pin down. But it's also why feeling tones are so important in Focusing. "There's a kind of aching in my shoulders" is one thing. "They feel really tired and despondent" is quite another.

## ***A Triad of Focusing***

The triad of "brains" or energies gives us a general picture of psychic functioning, but this isn't specific to the activity of Focusing. How can we use it to generate something which corresponds more closely to what we actually do when we Focus? To examine this in detail, I would like to start with an example which Eugene Gendlin gave us in his book, *Focusing Oriented Psychotherapy*. It's in Chapter 4, pages 25-40.

I'll condense it down to the bare essentials here. The client has a low opinion of herself, and she gives examples of how she "holds back", "gets jittery" and "pulls away" from situations where she would be tested, like going out with a man or doing well in an exam. She talks about this for a while, then the therapist invites her to imagine "going ahead" with something (meeting a man, for example) and sense into what it is that holds her back. She has a few goes at this, then she stays with it long enough to touch the actual sense of "scared" which lies underneath the "pulling back". Next to the fear, she also senses something that wants to pull her into "apathy", which is a kind of self-deadening. Then, after a long period of going inside, she comes out with something entirely new: "This is an all-good part of me, but it would rather be dead than come out to ... um ... being tromped on." Gendlin comments: "Now the shift has taken place. Something new has opened, and it turns out that this is an "all good" part of her that pulls back ... she senses this part of her that seems much more significant than simply being the reason for the pulling back. ... Rather than being negative, 'what pulls back' has turned out to be a good and loving part of her."

The sequence has three distinct phases. The phases are separated by what we might call "critical thresholds", when *something unexpected* comes along. In phase one, she is aware of a difficulty which seems to make her feel bad about herself, and she wishes to understand it better. This is what Gendlin often calls "that whole thing". It's a "something" that we can talk about in terms of behaviours or results, but we remain unclear about what it really *is* or how it works in us. So in phase one, she invites a felt sense of "that whole thing" to form itself in her body. The first critical threshold comes when she finds herself in touch with something she calls "the pulling back". Now "that whole thing" has given rise to a definite felt sense. The felt sense didn't come from thinking, but from inviting it and then being sensitive for what "came along". She didn't make it happen. It revealed itself to her because she stopped pushing (i.e. wishing it were different) and just let it be there.

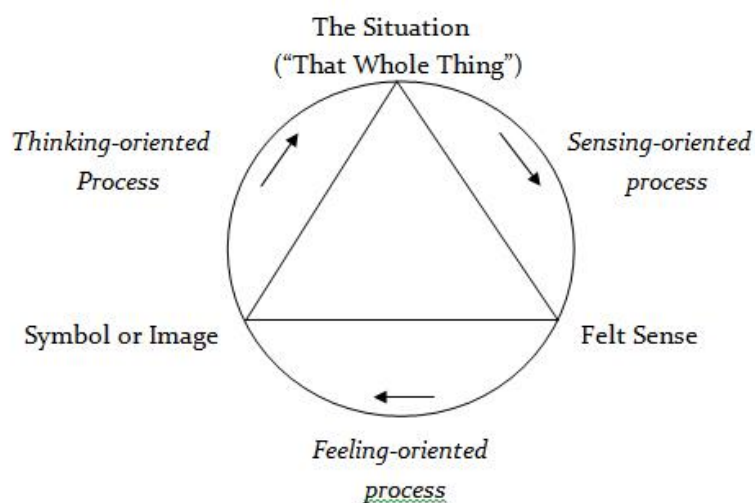
Phase Two consists of what you might call "cooking" the felt sense, refining it, using words or images to resonate with it, searching for the essence of it, and so on. Once there is a definite sense of "something there", the Focuser, or their companion, or the therapist, might question it: What's the worst of this? What's it scared might happen? What does it want? The woman in Gendlin's account spends three minutes (which seems a long time, in a therapy session) standing next to it, as if she's saying to it: "It's OK, you can talk to me, I'm not going to hurt you." Here she is inviting the second critical threshold in the process, which will come when she finds an image or a verbal symbol which encapsulates the *meaning* enfolded in the felt sense.

She passes this threshold when she gives expression to "something inside" that says "I'm an all good part of you, but I'm really scared I'll get tromped on." This is accompanied by what Gendlin calls a "felt shift", which can be quite small - marked by a slight easing and a 'moving forward' of the felt sense - or it can be larger and more significant, as in this case, when her "whole thing" re-presents itself in a new and unexpected guise.

She now understands her behaviour (and therefore, the situation itself) in a new way. If she were to verbalise her understanding, she might say: "I'm not a 'bad person' because I pull back! I

pull back because I need to protect something really precious in myself." Thus after the second critical threshold, we enter Phase Three – staying with it long enough to allow the full significance of the discovery to register. This is the more “thinking” part of the process, which might give her a clue as to what to do now, or how to take the process further. If she does take it further, she still won't be magically transformed by just one Focusing session, but she now has a very different perspective on "I'm a bad person", if she chooses to pursue that trail<sup>1</sup>. She has opened a door which leads into a different state of wholeness.

Note that finding the felt sense is a body-oriented process, finding the appropriate symbol appears mainly as a "feeling" experience, while the new understanding that comes if we assimilate it properly belongs more to the world of “thinking”. This isn't always clear during a Focusing session, and in any case Focusers tend to see sensation and feeling as combined (as they are in the term “felt sense”) and to privilege both of these above thinking. Nevertheless there is a sense in which this threefold division throws light on the integrity of the process, as shown in the following diagram, which represents it as a triadic structure:



Now we can explore the internal structure of these processes in more detail.

### ***The Inner Hexad***

In the account of the Focusing process which we used to explore the triad above, there was much that was assumed or elided, which now needs to be made explicit so that we can tease out the details of the inner hexad 1-4-2-8-5-7. This is by no means easy, as there is very little apparently happening during a Focusing session, so the different stages of the process are not particularly well differentiated from the point of view of the external observer. Besides, every individual Focuser is encouraged to understand the process in their own way, rather than following a fixed set of guidelines. Focusing is a very internal process, so most Focusing teachers adapt what they teach to each individual student in the hope that they will somehow “get it”.

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<sup>1</sup> I should mention that this feeling of being a “bad person” represents something very pervasive in our culture, which psychotherapists recognise as one of the most pernicious aspects of the “developed” Western psyche: that is, our tendency to be crippled by self-hatred, which leads to negative projections on a massive scale and stops us from reaching our potential in every field.



For example, many Focusers don't start with an explicit situation (corresponding to "that whole thing") that they want to explore, but just sense inside for "what's there". Usually this works well; occasionally it just leads to a mush. Often they start with no particular situation in mind, but then it becomes clear that what's coming up does refer to a specific situation. Gendlin's original method included as its first step, a review of all current situations that seemed "difficult" to the Focuser in some way, so I will assume for the sake of clarity that this is a normal part of the Focusing process.

It has to be remembered, also, that every "difficult" situation has numerous isomorphic precedents; indeed, most of our interpersonal difficulties arise from situations way back in our childhoods when we weren't given enough support, so we had to develop coping strategies which, in the course of time, became deeply-ingrained habits, often quite dysfunctional. Hence any situation is liable to have historical resonances, which often appear as part of the Focusing process, and impart to it a certain repetitiveness.

To begin with, then, the Focuser sits in a comfortable position, usually with a companion, in a place where he or she won't be disturbed, and brings their attention into their body. I will call this "preparing to Focus" and assign to it the number 1.

Next (in the classic Gendlin method) the Focuser does what's called "Clearing a space", which means he or she brings to mind all the situations that "come between [them] and a sense of well-being", i.e. all the situations that cause them some kind of difficulty. Then they wait and see which of these situations "wants their attention". I will call this "Identifying the situation", but I think we need to give it the number 4 rather than 2, for reasons that will become clear.

Next, the Focuser "takes the situation inside" and looks for the Felt Sense that corresponds to it. Focusers often call this "Inviting what comes" and we will place it on the number 2. When Focusers leave out 4 and go straight to 2, they are implicitly taking "the situation" to mean "any or all of my situations", but then what often happens is that they find they are responding to one situation that's particularly salient for them, which means that they still go forward to 4 and then back again to 2.

Within the 4-2 interval, they find the Felt Sense at 3. This "comes to them" in a way that can't be predicted – that is, as it were, "from outside". This is what we would expect in the context of the Enneagram.

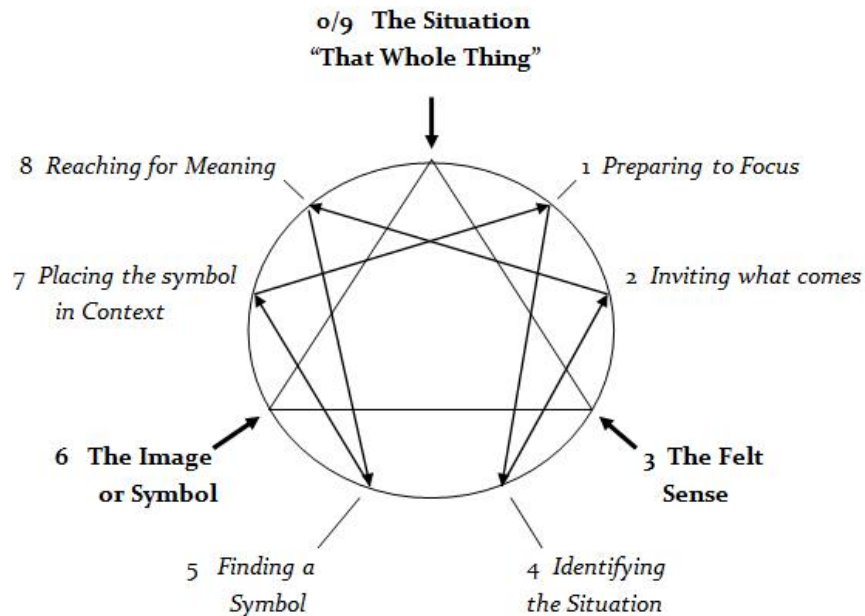
When a felt sense has formed, there is a powerful pull towards the number 8, which I will call "Reaching for meaning". Experienced Focusers don't always immediately respond to this by going down the 8-5 pathway, because there is often more to be explored across the 4-2 interval by looking more closely at the felt sense.

What happens at 8? Here they are looking for some kind of symbolisation for the felt sense. This again, like the felt sense itself, can't be manufactured by some logical process, but simply arises in the Focuser on its own. Sometimes the Focuser tries unconsciously to manipulate the symbolisation process according to the agenda of one of their internal "parts" (what Gurdjieff would call one of their many I's), but it's not difficult for an experienced Focuser to sense when this is happening. So the "fitting image or symbol" comes in at point 6, and is then subjected to what Focusers call "resonating" – that is, bringing the symbol into contact with the felt sense to see how it "fits". To illustrate this, I call point 5 "Finding a symbol", and point 7 "Placing the symbol in context". The word "context" here refers to the situation *as experienced in the felt sense*, against which the symbol (image or words) has to be tested.

We now have a version of the complete hexad 1-4-2-8-5-7. In most sessions, the Focuser will go round this circuit not once but many times, which is perhaps why the separate stages become

somewhat indistinguishable in practice. And then, of course, point 9 will often present “that whole thing” in a very different light than it first appeared when it was point Zero. This is not only because the situation has now been experienced in some depth, but also because the essence of the situation may be found to be substantially different in nature from the way in which it was initially formulated.

If we add the triadic structure, represented above, to the hexad which we have just explored, we can construct a complete Enneagram of the Focusing process, which looks like this:



## Conclusion

There’s no doubt that the Focusing process maps quite well onto the Enneagram. But does this teach us anything?

I think it does, especially in the sequence 7-8-9, where the process opens out into a kind of digestive mode (by analogy with the Enneagram for the community kitchen, which we looked at earlier).

Here, for example, is an abbreviated account of a session as I remembered it afterwards, taken from my 2003 journal. The session happens just four days after my wife Jane has been told that she is probably suffering from bone cancer:

*There’s a lonely place inside, with a long history. It feels bereft, abandoned. It feels empty, but also full. Some sort of liquid seeps in, but there’s never enough of it. It’s a hungry baby – but the baby is also wise – and he’s full of sorrow. The sorrow is for my mother, and also for Jane (I am crying now)... There’s a piece of the puzzle that’s been missing all these years, and now is an opportunity to replace it, to give something back for my mother. My stomach is churning noisily, but my heart is full of hope. My heart is like a point of light which stays constant while everything else is wrenched apart and churned up. The point of light isn’t static, it’s about meeting life from moment to moment.*

Some of this, near the beginning, is a description of what is experienced at point 3. Some of it is about the imagery that comes in at point 6. Much of it is about what happens between points 7

and 8, and becomes the “understanding” that I take away and digest at point 9. It’s at point 7 that the imagery is *contextualised* so that it opens out into my life *history* as well as into the *values* towards which I wish to orient myself. This then becomes a source of strength and meaning for me in the journey through my wife’s terminal illness.

Thus one might place questions in front of oneself at point 8, either explicitly or implicitly, such as (for example) “What significance does this insight have for my personal journey?” or “Is there some way I can think about/use/incorporate this insight in a practical sense?” Such questioning is not particularly encouraged by Focusing teachers, as there is a tendency to give the sensing/feeling process a kind of mystical status, so that the felt shift itself *is* the change, and any attempt to *actively digest* what comes up in the session will merely interfere with its work. But questions like this do in fact occur to us, and my present Focusing partner and I often discuss them afterwards, because we find it useful as a way of assimilating what has been “shown” during the session.

As she, like me, also has a background in psychotherapy and in the Gurdjieff Work, this works well for us. At the time when I was having all those discussions with Dom Sebastian that I referred to earlier, our mutual interest was in Christian mysticism, so this provided the framework within which we contextualised our Focusing experience, and that also worked well for us.

Finally, I would like to say something about how I see the practice of Focusing fitting in with the practical side of the Gurdjieff Work, because in my experience they complement each other remarkably well. The crux of it is in the Work practice of *self remembering*, which is a fundamental part of the Work but one which I always found incredibly difficult to put into practice. It needs a complementary practice alongside it which helps people, against the basic direction of our Western cultural history, to *consciously inhabit their bodies* instead of spending the whole time “up in their heads”. One way of achieving this is by practising what we used to call “the Movements” and Gurdjieff referred to as his “Temple Dances”. However this depends on the availability of a good teacher, and such teachers are in very short supply. Another way would be to practice Focusing, which depends much less on the availability of a good teacher (once the student has “got it”) and is then always available as an aid to one’s own psycho-spiritual journey. The disadvantage is that Focusing doesn’t have any of Gurdjieff’s cosmology built into it, as the Movements did; but the advantage is that it’s uncomplicated, and it helps people to deal with the psychological damage that is often caused by their own inner critic, which the Gurdjieff Work manifestly fails to do. For myself, I found that after a few years of Focusing practice, I actually managed to begin to understand some of the fundamental aphorisms that Gurdjieff used, such as “Man cannot do”, “Man is asleep”, and “Man has not one ‘I’, but many”. And I found that I now understood them not as accusations which I couldn’t deal with and which therefore made me feel inadequate, but as interesting observations which motivated me to explore them further.

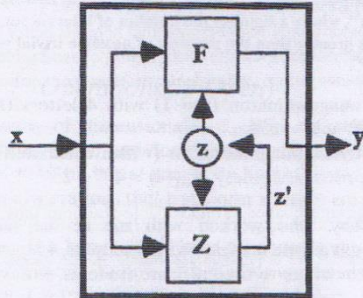
I am currently developing a course of psycho-spiritual work at a land-based learning centre at Embercombe in Devon, where some of the 4th Way practices adapted from J G Bennett’s work will be introduced alongside some of those derived from Focusing. For further information, please contact [chriswilson@phoncoop.coop](mailto:chriswilson@phoncoop.coop).

# ARE WE A NON-TRIVIAL MACHINE?

Figure 1: Foerster's Drawing of a Trivial Machine (Foerster, 2001)



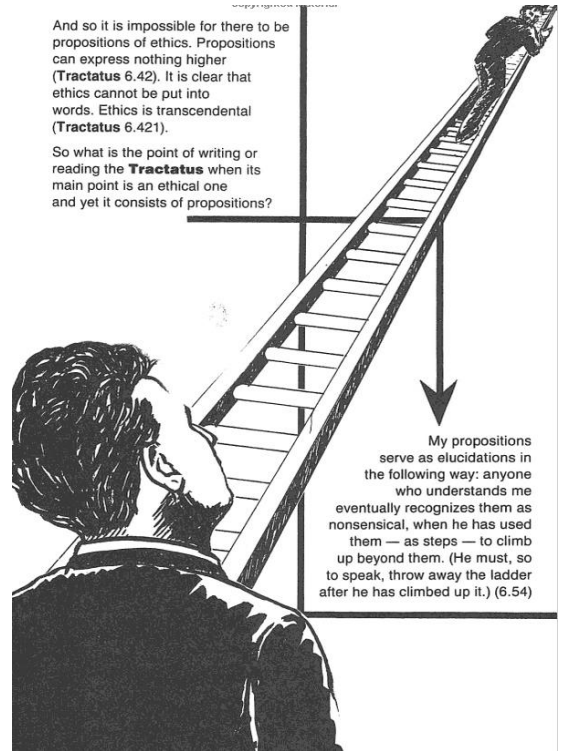
Figure 2: Foerster's Drawing of a Non-trivial Machine (Foerster, 2001)



The behaviour of a non-trivial machine is interesting because it is unpredictable. The non-trivial machine embodies Wittgenstein's critique of history, that there is no causal connection between past and future events. The non-trivial machine creates surprise.

8. The term *trivial* has caused some consternation. Alfred Inselberg (2010), a PhD student of Foerster's in the 1960s, dislikes what he sees as the silliness of the term and claims it does not provide suitable credibility and gravitas. Inselberg argues that, as a result, many do not take Foerster's idea seriously. I like the term *trivial* because, as I understand Foerster, he is, in effect, talking about variation and learning.

And so it is impossible for there to be propositions of ethics. Propositions can express nothing higher (Tractatus 6.42). It is clear that ethics cannot be put into words. Ethics is transcendental (Tractatus 6.421).  
So what is the point of writing or reading the **Tractatus** when its main point is an ethical one and yet it consists of propositions?



My propositions serve as elucidations in the following way: anyone who understands me eventually recognizes them as nonsensical, when he has used them — as steps — to climb up beyond them. (He must, so to speak, throw away the ladder after he has climbed up it.) (6.54)

- Ax. 1.  $\{P(\varphi) \wedge \Box \forall x[\varphi(x) \rightarrow \psi(x)]\} \rightarrow P(\psi)$
- Ax. 2.  $P(\neg\varphi) \leftrightarrow \neg P(\varphi)$
- Th. 1.  $P(\varphi) \rightarrow \Diamond \exists x[\varphi(x)]$
- Df. 1.  $G(x) \iff \forall \varphi[P(\varphi) \rightarrow \varphi(x)]$
- Ax. 3.  $P(G)$
- Th. 2.  $\Diamond \exists x G(x)$
- Df. 2.  $\varphi \text{ ess } x \iff \varphi(x) \wedge \forall \psi \{\psi(x) \rightarrow \Box \forall y[\varphi(y) \rightarrow \psi(y)]\}$
- Ax. 4.  $P(\varphi) \rightarrow \Box P(\varphi)$
- Th. 3.  $G(x) \rightarrow G \text{ ess } x$
- Df. 3.  $E(x) \iff \forall \varphi[\varphi \text{ ess } x \rightarrow \Box \exists y \varphi(y)]$
- Ax. 5.  $P(E)$
- Th. 4.  $\Box \exists x G(x)$

## Gödel's Mathematical Proof of God's Existence

- Axiom 1.** (Dichotomy) A property is positive if and only if its negation is negative.
- Axiom 2.** (Closure) A property is positive if it necessarily contains a positive property.
- Theorem 1** A positive property is logically consistent (i.e., possibly it has some instance.)
- Definition.** Something is God-like if and only if it possesses all positive properties.
- Axiom 3.** Being God-like is a positive property.
- Axiom 4.** Being a positive property is (logical, hence) necessary.
- Definition.** A property  $P$  is the essence of  $x$  if and only if  $x$  has  $P$  and  $P$  is necessarily minimal.
- Theorem 2** If  $x$  is God-like, then being God-like is the essence of  $x$ .
- Definition.**  $NE(x)$ :  $x$  necessarily exists if it has an essential property.
- Axiom 5.** Being  $NE$  is God-like.
- Theorem 3.** Necessarily there is some  $x$  such that  $x$  is God-like.

## THE “FOUR IDEALS” EXERCISE AND THE FOUR LIMBS

Joseph Azize



It was my privilege to make, Gurdjieff’s “Four Ideals Exercise” publicly available in an article ““The Four Ideals”: A Contemplative Exercise by Gurdjieff”, published in *ARIES: Journal for the Study of Western Esotericism*, 2013, vol. 13, pp. 173–203. I will offer here, a few comments relating that exercise to the movement of the blood. Throughout, I assume a familiarity with Ouspensky’s *In Search of the Miraculous*.

The “Four Ideals” was taught by Gurdjieff to George Adie on 1 October 1948, and under his tuition, Adie persevered with it for five months. The article establishes the authenticity of Adie’s text of the exercise, and sets out my transcription. I made a number of comments about its first part of the text. I

will not repeat those comments except to say that the exercise purports to have been given to enable an exercitant to make contact with and eventually be nourished from “reservoirs” or “foyers” of higher substances. These reservoirs are formed above the atmosphere of the earth when devotees of four “ideals” (Muhammad, Buddha, Lama and Jesus) “send their emanations” towards their personal ideal. These emanations are formed when “they pray to it (the ideal), they stretch towards it.”

First, let us take the filling of the limbs with the substances which have been “sucked” into the exercitant by means of a “thread”. First the right arm, then the right leg, then the left leg and finally the left arm are carefully filled after trying to “suck” into them substances from one of those four reservoirs high in the atmosphere above the planet. If nothing else, this is unusual. What is going on?

For the sake of this short piece, I will accept that an “ideal” does in fact exist above the earth in each of the four places designated as having been associated with the “ideal”, and that higher substances can be drawn from them into our bodies. I shall restrict my comments to the role of the limbs. The role of the arms and legs is, in my view, much underestimated in culture, both popular and religious. Their value is chiefly aesthetic. To the best of my knowledge, no one has made as much use of the arms and legs for spiritual purposes as Gurdjieff, and I am not referring only to the Sacred Movements.

The limbs also have important roles in Gurdjieff’s preparation and in other of his exercises. The attention is often turned to them, and they are often “filled” with substances, such as “sensation”, “feeling” and “the breath”. In the Four Ideals exercise, the limbs are used as “reservoirs” of the attracted substances. In the next section of the exercise, the said substances are drawn from the limbs into the region of “the level of the breast”. There, they blend with the incoming air. That blend is then “poured” into the sex organs. From there, it is sent into the limbs and other parts of the body.

This is all interesting, but let me just take ponder one discrete matter: that the limbs are said to store the sucked in substances.

First, speaking about the work of the body in general, and not only during this exercise: the limbs can take a lot of blood, and it can flow through them at faster or slower tempos. For reasons I will not go into here, it may well be that it is the blood in the limbs which acts as an “accumulator”, and with which these substances blend so that they can be utilised for conscious development, or as food for the “higher centres” (which comes down to the same thing, for conscious development is possible only when there is a normal alignment of the lower and the higher centres, and given such a normal alignment, it will occur through the vicissitudes of life). Incidentally, I do not by any means discount the importance of any part of the physical body: skin, flesh, muscles, tendons, bones, marrow, nerves, and the inter-related system of hormones, amino acids, peptides and proteins. I suspect that none of these are without a role in what I have referred to as normal alignment and in the normal operation of the human bodies.

Second, my experience, together with the sparse medical evidence I have been able to locate, indicates that it is possible to cause blood to move into the limbs simply by using thought or, more precisely, self-suggestion. One can imagine that the blood is being pumped into the limbs, especially through the mass of the limbs and into the fingers or toes, for it to commence moving into them. One can also present to oneself that all or part of the arms or legs are in a warm place, wrapped in a hot flannel, or that one’s limbs are immersed in a hot bath, a bucket of icy cold water, or so on. That is sufficient to start moving the blood there. There is peer-reviewed medical evidence that “signals from higher brain centres (central command)” can increase cerebral blood flow. I would suggest that it can increase blood flow into the limbs, and – I would think – wherever there are blood vessels.

As the blood moves into the arms and legs with a stronger flow, the pulse throughout the whole of the body starts to become more even and calmer. I have confirmed this with a pulse-meter. There is significant anecdotal evidence that imagining the blood flowing into the legs can help one fall asleep more quickly. A higher level of control, but very difficult to obtain, comes when one can sense more of the movement of the blood throughout the body as a whole: what Ouspensky, and possibly also Gurdjieff, called “the second stroke or the ‘big heart’.” *Miraculous*, 35<sup>1</sup>.

Third, my experience is that when the blood more abundantly fills the limbs, there is a heightened sense of physical well-being. One can, of course, cause the limbs to be filled by ordinary physical exercise, such as running. However, the first advantage of using a sedentary method such as Gurdjieff’s exercises is that one avoids the excitement and subsequent tiredness which often comes with exercise. Second, exercise causes the blood to move everywhere: which is fine. But the mental and emotional calmness which can come through these exercises is related to the manner in which the blood is caused to move, and the intent and knowledge brought into play. That is, the beneficial effects of these exercises are increased and extended when they are done consciously and with not just knowledge, but understanding. Fourth, the effects of exercise may sometimes proceed with more than the “law-conformable gradualness”, *Beelzebub* 1172. As he said at the same page: “... only by a gradual change of the tempo of one part of the whole is it possible to change the tempo of all this whole without injuring it.” Fifth, I suspect – I should possibly say I conjecture – that we often have too much blood moving around the torso and into

the neck and head, and that this is related to feverish mental and emotional activity. We should not try to interfere with that except indirectly, softly and gradually, e.g. by using the Four Ideals, or simply by mentally relaxing, and most definitely *not* by using chemicals or drugs.

By altering the tempo of the blood in the limbs, one alters the tempo of the entire organism. Apart from the importance of circulation of the blood and other substances in good health (“a more or less correct tempo for the transformation of the substances required for that passive existence of theirs”, *Beelzebub* 507-508), certain tempos are more closely related to the third state of consciousness.

The relationship of different tempos to different states of consciousness, and the undesirability of having diverse tempos within the one organism, is touched on at pp.564-565 of *Beelzebub*. All I wish to add is that it seems to me that through the Four Ideals Exercise, it is possible to bring about a more unified tempo, one more favourable for conscious development. I think that the role of the limbs in that process is significant. Of course, our attention to the limbs should be bilateral, developing both sides equally, so far as possible.

#### Notes:

1. Anyone purchasing the *ARIES* article through the Brill website should note that the reference to “Beatrice Hastings” is an error. The lady concerned was “Beatrice Sinclair”. I apologise for the error.
2. The role of the blood and “threads” which connect one to finer substances is noted at *In Search of the Miraculous*, 97.

## SPACIOUSNESS TECHNOSCIENCE

**Dermot Furlong – Trinity College, Dublin**

*We listen to meanings, not waveforms  
There's more to hearing than meets the ear*

### **o. Introduction**

Audio engineering is concerned with advancing the scientific understanding of sound and with the development of new audio technologies. In that sound is a phenomenon of human perception, fundamental to all audio engineering is an understanding of the relationship between physically controllable parameters and experienced auditory phenomena. This relationship is the specific concern of psychoacoustics.

Since the definition of psychophysics by Gustav Fechner in the 19th century, psychoacoustics has played a fundamental multidisciplinary role as a subset of experimental psychology involving acoustics and physiology. It can be thought of as the study of subjective human perception of sounds. Understanding behavioural and emotional responses to music, for example, depends on the human perception of sound, and hence the significance of psychoacoustics for understanding the human response to music. Since its inception, psychoacoustics has gone through several paradigm shifts that were influenced by the epistemological models adopted by various schools of psychology. Its current general interpretation regards perception as mechanically linking objective physical cause and subjective mental impression, mediated by the intricate mechanisms of ear physiology. Such a causal epistemological model is not without merit, and its apparent

success for elemental perceptual aspects has supported an unquestioning acceptance of naïve realism by contemporary psychoacousticians – that the ‘everyday impressions’ of physical auditory objects are subjective qualities of an objective world external to the individual. Psychoacoustics is therefore that branch of science which studies the psychological and physiological responses associated with physical vibration.

But, herein lies a problem in that inherent to this definition of psychoacoustics is the assumption that mind can be dealt with in a mechanistic manner. Philosophically, a mechanical approach to matters of mind suggests a concept of mind such as Gilbert Ryle’s ‘ghost in the machine’, with his related question as to what the external world is external to? (Ryle, 1949). Ryle’s observations point to the inadequacy of a mechanistic epistemological model that regards mind as one object amongst many within an enclosing spatial container. However, abandonment of a mechanistic epistemological model leaves the investigator in a conundrum. If the goal of psychoacoustics is not to identify the physical cause of experienced acoustical phenomena then what should it be, and what investigative methodology should be used? If the concept of physical cause is to be relegated, then what exactly is meant by objectivity? Adopting an assumption of mental impressions resulting from external physical causes is a simple and familiar conceptual model, but it is not one which is always useful even for more elemental sonic qualities, as will be discussed.

The purpose of this paper is to present some more recent developments in philosophy and in cognitive science which have presented a different approach to objective knowledge for any experienced phenomenon. The perception of auditory space is here examined as an example of a phenomenon which has been suggested as being historically fundamental to the evolution of musical forms (Forsyth, 1985). The contribution of contemporary technology is examined in this context as a contributor to the experience of auditory space, and therefore of music.

## **1. Limitations of a Mechanistic Epistemological Model for Auditory Perception**

The assumption adopted in psychoacoustic investigations is that of naïve realism where it is taken as a given that a physical cause can be directly associated with the qualia of any experienced acoustical phenomenon. Thus, informal interpretation suggests that pitch is the subjective response to the objective stimulus of physical waveform frequency. Loudness is similarly regarded as the subjective response to waveform amplitude, and Timbre is the subjective experience of objective waveform spectral profile. While these interpretations often prove to be useful, there are many experiences which point to their inadequacy. For example, Pitch experience is indeed a function of physical frequency, but it can also be shown to depend on waveform amplitude for identical frequency stimuli ([ASA Auditory Demonstrations, 12](#)). Similarly, the experience of auditory Loudness depends on waveform amplitude, but it is also influenced by the frequency of a stimulus tone for identical amplitude stimuli ([ASA Auditory Demonstrations, 6](#)). Similarly, if a waveform is temporally reversed, the experienced timbre can be drastically altered while the waveform spectrum remains identical. The typical interpretation of such anomalous phenomena is that they are merely examples of the limitations of the sensory and cognitive system. Rarely is the adequacy of the adopted causal, mechanistic model questioned.

More disturbing to the assumptions of naïve realism are the cross-modal illusions such as the McGurk effect which highlights how vision can influence what is heard (McGurk, 1976; <http://www.youtube.com/watch?v=jtsfidRq2tw> ). In a parallel manner, a more recent experiment has found that listeners’ visual experience can be influenced by simultaneous auditory stimuli –



the illusory sound induced flash experience (Shams, 2000, <http://www.cns.atr.jp/~kmtn/soundInducedIllusoryFlashz/>). A feature to note in such examples is that audition and vision are not as experientially isolated as is usually assumed. As a consequence, considering visual examples, as will be done here, can be useful in the development of an understanding of auditory phenomena.

Overall, the assumptions of naïve realism are contra-indicated by such perceptual ‘illusions’ which show that physical cause is not simply related to perceptual experience. Perception involves more than passive reception of sensory stimuli from the outside world. Philosophically, such questions have a long tradition going back to the ancient Greeks, at least. Aristotle, for example, defines varieties of cause (Lear, 1988), of which the distinction between efficient and formal cause are of particular relevance here. Efficient cause can be thought of in terms of the concepts of mechanical interaction where events can be regarded as being externally caused. Formal cause has a less mechanistic interpretation and relates to the required conditions for any phenomenon to be experienced - formal cause is concerned with the generative conditions of any phenomenon. This is particularly appropriate for the experience of auditory space, as space cannot be categorised as a physical object!

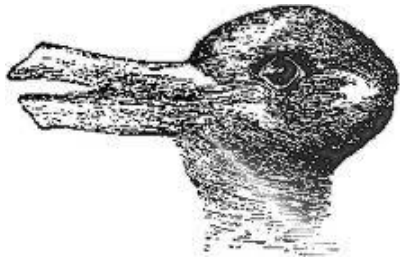
Phenomenology is the study of the meanings which things have in our experience. It has taken a number of different forms over time, and hermeneutic phenomenology attempts to identify the originary structure involved in any experience – what are the primal, necessary conditions for any phenomenon to be experienced. While phenomenology in general is often regarded as a subjectivist philosophy which therefore exhibits a complex relationship with science (Gurwitsch, 1974), hermeneutic phenomenology (Gadamer, 1976) has been developed in terms of identification of the objective conditions (i.e. not subjectively arbitrary) required for any experience to follow. In this interpretation, phenomenology can be regarded as seeking to identify the formal cause of any phenomenon. Don Ihde has focussed on auditory experience principally from a more classical phenomenological perspective in (Ihde, 2007).

The perceived world of common, everyday experience is termed the ‘Lifeworld’ in the phenomenological tradition. Recognizing it as an experiential domain is to recognize that it is a combination of both sensation and creative imagination (Lakoff and Johnson, 1980). As such, the experienced meaning of perception is a constructed interpretation which depends as much on cognitive organization as it does on the presented physical stimuli. Furthermore, Embodied Cognition studies (Nunez and Freeman, 1999) have recognized that imagination is organized by embodied schemata, and that it demonstrates structures which are defined by body physiology as controlled by the central nervous system. Consequently, imaginative structure can be identified as employing embodied schemata in its organization of experienced form. The forms of experienced music are no exception, and have been shown to also rely on embodied schemata (Zbikowski, 2002).

Given the subjective involvement in experienced meaning, how might it be possible to be objective about the experienced meaning which is music? What methodology should be adopted? These questions necessarily introduce concerns for investigative methodology as it relates to experienced auditory phenomena, science and objectivity. And, how might phenomenological investigation impact upon audio engineering design? Such issues are the concern of this paper in which the particular example of the experience of auditory space is considered in the context of the reconstruction of recorded music.

## 2. Illusion, Postphenomenology and Technoscience

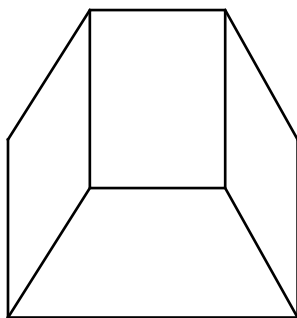
Contrary to the assumptions of normal perception, illusions do not necessarily demonstrate how the sensory system can sometimes be fooled, but rather they demonstrate that cognitive organization is involved in everyday perception. In order to facilitate explanation, visual



examples (from Ihde, 2009) are used here to introduce some relevant concepts, with the understanding that visual phenomena are not entirely unrelated to audition in that both exploit common cognitive organizational features. An initial example to emphasize the contribution of cognitive organization to visual perception is that of the Duck-Rabbit illusion, famously used by Ludwig Wittgenstein in his discussion of aspect seeing (Wittgenstein, 1953):

In this case, although nothing is changed on the page, two distinct alternative interpretations (duck or rabbit) of the presented graphic image can be made, depending on how the graphical elements are organized by the observer. That is, there are two discrete meanings which can be experienced for this visual presentation through variation of observer attention. Identifying different meanings for a sensory presentation is an example of multistable interpretation of phenomena, i.e. that there may be alternative meanings that can be experienced for any given stimulus. Rather than be considered as distinct subjective interpretations of a separate objective world, as is the case for the assumptions of normal science, such experienced meanings are regarded phenomenologically as distinct sedimentations along an organism-environment experiential continuum.

Various examples of how visual spatial impression depends on cognitive organization have been presented by Ihde (Ihde, 1986; Ihde, 2009), some of which are repeated here. For the following graphical example, different sedimentations or interpretations of the visual image are possible, depending on the viewer's attention.

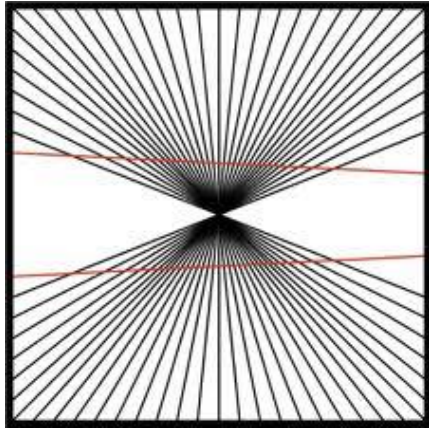


Here, a variational analysis involves alteration of cognitive organization through the attentional focus of the experimenter, which reveals three interpretations or sedimentations of the visual stimulus - Stage / Pyramid / Robot. Each interpretation also has a distinct spatial implication for the observer's sense of embodiment. The Stage interpretation regards the lower central planar surface as a stage floor, with the other planes forming the stage backdrops and an implied observer point-of-view (POV) in an elevated balcony box looking down on the stage. That is, this perspectival perception also includes a distinct impression of observer embodiment.

A second possible interpretation of this visual image is that of a Mayan pyramid. Now, the upper central planar surface is the top of the pyramid, with the remaining surfaces forming the downward sloping pyramid sides. For this case, the implied POV and associated imaginative sense of observer embodiment involves that of a helicopter view from above.

A third possible interpretation involves a reduction of spatial dimensionality where the visual stimulus can be regarded as a completely 2-D planar presentation which can be interpreted as a headless robot image. Here, the bottom line is the ground on which the central square shaped robot body stands on legs, using two crutches in its outstretched arms. Note that the two dimensional interpretation also implies an altered POV and observer embodiment, where now the observer is directly in front of the 2-D robot figure.

For these examples, variational analysis involves alteration to the observer attention, with implications for the observer's spatial impression and sense of embodiment. The alternative organism-environment sedimentations that emerge for the stimulus yield a more comprehensive analysis of experience than that of the more standard discrete subjective interpretations! Variational theory thus generates a set of distinct perceived worlds - Life worlds - with altered spatiality, and sense of observer spatial embodiment.



The final visual example used here emphasizes the fact that interpretation does not have to involve the generation of discrete interpretations – i.e. distinct, subjective ‘meanings’ of a separate, objective stimulus presentation. The Hering Illusion exhibits the continuous nature of interpretation, such that it would be more accurate to say that the ‘meaning is’ the experienced form within an organism-environment continuum. That is, the ‘object’ perceived cannot be separated from the observer but is a conjoint experience! For the case of the Hering illusion display, the spatial details of the perceived image depend on the cognitive organization applied to the sensory stimulus elements, which organization is under attentional control. If this visual stimulus is viewed

as a 2-D planar image, the horizontal lines appear to be curved. However, if the viewer focusses on the central point of convergence, and imaginatively pushes this point to infinite distance in 3\_D space (i.e. engages imaginatively in a variation of the cognitive organization involved), the curved horizontal lines are perceived to straighten. This process can be repeated in forward and reverse directions with the effect that the horizontal lines continuously straighten and recurve, thereby indicating the continuous active involvement of cognition in the spatial interpretation of a perceived image to create an interpreted meaning. Thus, perception is not passive reception from an external world, but is rather an active construction of perceived worlds within an organism-environment continuum. The continuously variable interpretation of the sensory stimuli of the Hering Illusion example demonstrate that the spatial detail of a perception is bodily interactive with an environment which variational analysis (here using alteration of viewer attention) can change.

A further point to note in this section relates to the potential role of technology in the stimulus-cognitive organization duality that is involved in all perception. From the examples considered, the concept of spatial perception as being dependent on both sensory stimulus and cognitive organization has been emphasized. Postphenomenology highlights the fact that experience is dependent on the sensory stimulus detail and on observer contributions, which can also have social and cultural contributions. That is, the observer is embedded in an environment which includes physical and social-cultural dimensions. In such a Lifeworld perspective, it is worth noting that technological artefacts are not isolated from the observer, but are extensions of an organism's embodied interaction with an environment, with implications for both the observer's POV, sense of embodiment, and for the perceived environment including its spatial dimensions. Thus, rather than replace a conventional subject-object separation with an organism/environment continuum, it is useful to adopt an organism/technology/environment conceptual model of experience. Any particular experience is a sedimentation or interpretation along the organism/technology/environment continuum. Technoscience is the scientific methodology relating to postphenomenology which methodically addresses experience in order to identify the objective contributors to any experienced phenomenon. In such a context,

technological developments are embodied and can be regarded as phenomeno-technologies (Bachelard, 1984) which contribute to observer experience. The role of technology as a mediating factor in the definition of an experienced world is explored in some detail in (Ihde, 1990). In summary, while classical phenomenology has often been interpreted as a subjectivist philosophy, and therefore of little scientific value, postphenomenology has combined the rigorous analysis of classical phenomenology with the experimental orientation of pragmatism to outline a methodology for investigation of the objective, essential structures required for any phenomenon to be experienced. By adopting the experimental approach of pragmatism as a way to overcome the more standard subjectivist, anti-scientific interpretation of classical phenomenology, an investigative methodology for objective study of perceived experience is suggested. The result of the hybrid combination has been the definition of an experimental methodology involving variational analysis as one aspect of a scientific methodology based on active human involvement, potentially employing technological extension to investigator embodiment, in the development of a dynamic understanding of an experienced Lifeworld.

### 3. Future Prospects

Postphenomenology/Technoscientific Methodology allows of the definition of the essential acoustic structures of a music 'spatial environment'. That is, it provides a methodology with which define the objectively valid requirements for a spatial experience. Historically, musical presentation relied on architectural structures to control ear stimuli. However, recorded music can now exploit a digital 'built-environment' spaciousness processor for control of the experienced spatial impression. Such a Spaciousness Processor is an example of a Phenomeno-technology - a way of directly manipulating an experiential phenomenon, here auditory spaciousness, through the use of appropriate embodied technology instrumentation!

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### 37: THE REAL ANSWER TO LIFE, THE UNIVERSE AND EVERYTHING

**Christopher Kemp** – *New Scientist* December 2014 (Abridged)

MAXIM MAKUKOV has an idea.

It's unorthodox; you might call it "out there". Makukov understands that. He knew he'd have his critics the moment he began to develop it. But it's there in the numbers, he says, and numbers don't lie.

A cosmologist and astrobiologist at the Fesenkov Astrophysical Institute in Almaty, Kazakhstan, Makukov says the numbers reveal that all terrestrial life came from outer space. Not only that, it was planted on Earth by intelligent aliens. Billions of years ago, the planet was barren and lifeless. But then, at some distant and unknowable moment, it was seeded with what Makukov calls an "intelligent-like signal"-a signal that is too orderly and intricate to have occurred randomly.

This signal, he says, is in our genetic code. Highly preserved across cosmological timescales, it has been waiting there, like an encrypted message, for anyone qualified to read it. All of the teeming varieties of life on Earth - from kangaroos and daffodils to albatrosses and us - carry it within them. And now Makukov, along with his mentor, mathematician Vladimir shCherbak of the al-Farabi Kazakh National University in Almaty, claims to have cracked it. If they are right, the answer to life, the universe and everything is... 37.

The idea that terrestrial life has extraterrestrial origins has a long and sometimes distinguished history. The standard version goes something like this: a primitive alien life form, perhaps a bacterium, somehow hitches a ride through space aboard an object like a meteoroid, collides with our young planet and seeds it with life. Against innumerable odds, its descendants flourish and spread across Earth.

In 1871, Lord Kelvin hypothesised "that there are countless seed-bearing meteoric stones moving about through space". In his 1908 book *Worlds in the Making*, Nobel laureate Svante Arrhenius named the process "panspermia". As recently as 2009, Stephen Hawking speculated that "life could spread from planet to planet, or from stellar system to stellar system, carried on meteors".

Prestigious backers notwithstanding, panspermia has not found widespread acceptance, although many biologists accept a weaker version of it. "Most biologists will agree there is a contribution to the origin of life on Earth from cosmic sources," says P. Z. Myers of the University of Minnesota, Morris. "We have lots of organic compounds floating around in space." Makukov and shCherbak have taken it further. They're reviving something called "directed panspermia", the hypothesis that life was seeded intentionally by an extraterrestrial intelligence.

The idea goes back to 1973, when Francis Crick published a paper in the planetary sciences journal *Icarus*, at that time edited by Carl Sagan. In it, Crick asked the question: "Could life have started on Earth as a result of infection by microorganisms sent here deliberately by a technological society on another planet, by means of a special long-range unmanned spaceship?" Extraordinary claims like this require extraordinary evidence. For more than a century, people

have been trying to find at least some of that evidence - proof of the existence of sentient aliens. The bulk of this effort - known as SETI, or the search for extraterrestrial intelligence - has involved trying to detect radio signals. But despite almost a century of vigilance, says SETI senior astronomer Seth Shostak, they have heard nothing.

With one possible exception. In 1977, SETI researchers in Ohio picked up a 72-second burst of radio waves that was so close to what they had been looking for that one of the researchers wrote "Wow!" on the readout. Nothing like the Wow! signal has ever been seen since.

*"The genetic code is a perfect place to plant a secret message"*

The radio silence has inspired some to widen the search. Many have asked: what if the message is here on Earth already? What if we are the message?

In his 2010 book *The Eerie Silence*, Paul Davies, a physicist at Arizona State University, wrote about genomic SETI - the idea that our genome might house a secret message. He was following the physicist George Marx, who in 1979 wrote: "It is possible that a few billion years ago an advanced civilization prepared some sort of message using genetic engineering and sent it to Earth. This extraterrestrial DNA molecule became the starting point of biological evolution."

Makukov and shCherbak's ideas are in this tradition. But instead of rummaging through DNA, they look to the genetic code, a complex set of rules by which DNA is translated into proteins (see "Code within a code", above right). The genetic code shouldn't be confused with the genome, which is a specific set of genetic instructions for making a fruit fly, say, or a giant redwood. Instead, it specifies how to convert those instructions into proteins.

Unlike genomic DNA, the code is stable. Genomes mutate over time, but the code is passed down the generations without alteration and appears to have remained almost completely unchanged for billions of years. For that reason, says Makukov, it is the perfect place to plant a message. Billions of years ago, he says, that is precisely what happened.

To test the idea, Makukov and shCherbak devised a mathematical approach to analyse the code, searching for patterns unlikely to occur at random. Their arguments are often dense and impenetrable, filled with complex mathematical formulae. But at heart, Makukov says, "it's very simple". The genetic code is like some type of combinatorial puzzle, he says. In other words, once you begin to analyse it, hidden regularities emerge.

"It was clear right away that the code has a non-random structure," says Makukov. "The patterns that we describe are not simply non-random. They have some features that, at least from our point of view, were very hard to ascribe to natural processes."

In 1966, Soviet mathematician Yuri Rumer pointed out that the genetic code can be divided neatly in half. One half is the "whole family" codons, in which all four codons with the same two initial letters code for the same amino acid. The AC family, for instance, is "whole" because codons beginning AC code for threonine. On the other are "split family" codons, which don't have this property.

Rumer first noted that there is no good reason why exactly half of the codons should be whole. More profoundly, he also realised that applying a simple rule - swapping T for G, and A for C - converts one half of the code into the other. That might sound inevitable, but it is not. In 1996,

mathematician Olga Zhaksybayeva of the al-Farabi Kazakh National University calculated that the probability of it occurring by chance is  $3.09 \times 10^{-32}$ .

And Rumer's transformation is just one of many patterns and symmetries within the code. Another example: you can create a subset of codons including those with three identical bases (AAA, say) and those with three unique bases (GTC, say). Using a Rumer-type transformation, these 28 codons can be divided into two groups each with a combined total atomic mass of 1665, and a combined "side chain" atomic mass of 703. Both are multiples of the prime number 37, which has interesting mathematical properties of its own.

In fact, 37 recurs frequently in the code. For example, the mass of the molecular "core" shared by all 20 amino acids is 74, which is 37 doubled. Forget 42...

All in all, the Kazakhs have identified nine patterns in the code, which they spell out in detail in the journal *Icarus* (vol 224, p 228) under the provocative title "The 'Wow! signal' of the terrestrial genetic code". If you think that all sounds a bit like *The Da Vinci Code* for DNA, you're not alone. "It's flat out numerology," says Myers, who also notes the similarity to the pseudoscience of intelligent design- a comparison Makukov and shCherbak reject. "The hypothesis has nothing to do with intelligent design," they say.

Others are less critical. "It's not, in and of itself, absurd," says David Grinspoon, senior scientist at the Planetary Science Institute and author of *Lonely Planets: The natural philosophy of alien life*. "We're already learning to custom design organisms and we're already learning to send things out into space. If anybody else is out there, the chances are they're not as new at it as we are."

Davies is also quite forgiving. "If you crunch numbers long enough, you'll find patterns in almost anything," he says. "It was very clear to me at the outset that what this boils down to is an assessment: what is the probability that you might find something like this by chance?" To that, Makukov and shCherbak have an answer: about  $10^{-13}$ , or 1 in 10 trillion. In October, they published a second paper on the work in *Life Sciences in Space Research* (vol 3, p 10).

As to what - or who - planted the message, Makukov stresses that he doesn't know. "This is speculation," he says. "Maybe they're gone long ago. Maybe they're still alive. I think these are questions for the future." But on the basic idea, he is adamant. "For the patterns in the code," says Makukov, "the explanation we give, we think is the most plausible."

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