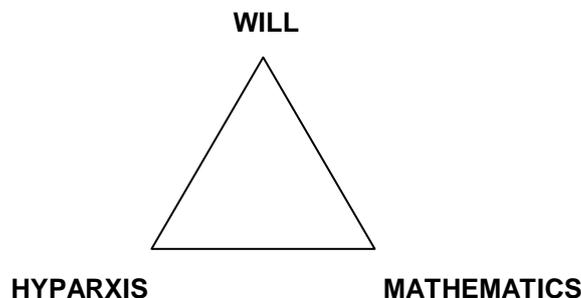


THE ABSTRACTION OF RECURRENCE

JGB associated *hyparxis* with *number* and *logic*. At times, he emphasised that this 'dimension' was independent of existence or 'stuff' (the provenance of eternity and being) so can be called 'abstract'. As a word/concept the abstract has two faces: in the one it is of the least significance – 'just an abstraction and not for real' – while in the other it is the most significant and even 'spiritual'. We can find the latter usage in Hasan Shushud's writings. Also, in Theosophy the abstract is attributed to the 'causal level' where the word causal means more like principle or law than pushing stuff around.

Strangely or not, JGB never simply said *hyparxis is mathematics*, but he might have done. There is a link to this idea in his discourse on language in which he includes mathematics as the language of gesture, in turn an expression of Will. What we are looking at now is a circuit of meaning such as:



There are many such circuits, necessary to enable us to map different schemes onto each other. Thinking about them is informative for many reasons but a most important one is to give a sense of the *relationship of meaning* that can recur in a fractal way. Thus, the whole relationship can map into any one of the terms. The repetition of a relationship – an *active* relationship - is the characteristic of *hyparxis*.

In the approach we are following now, considerations of time recede into the background.

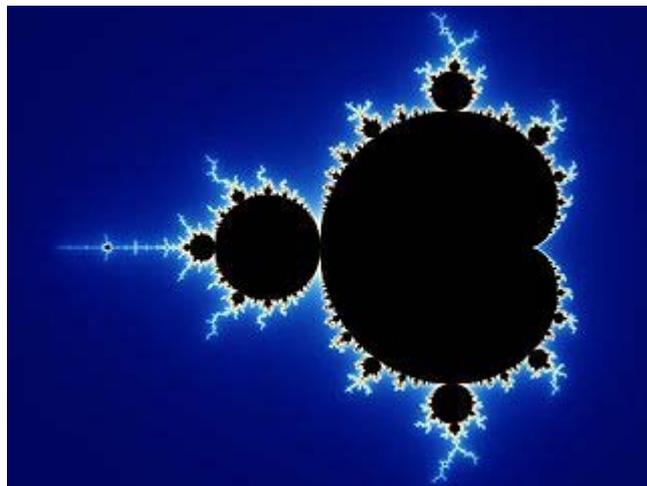
We can have mathematical operations that repeat themselves. At each repetition, they operate on the results of the previous one. For example, take the Fibonacci series: 1, 1, 2, 3, 5, 8, 13 each succeeding number is the sum of the previous two. One of the many things interesting about this series is that the ratio of terms converges towards a special number called *phi* known popularly as the Golden Mean, approximately 1.618. It is also interesting that if we start with *any* pair of numbers and apply the same rule we arrive at *phi*.

To make a radical jump, this may remind us of the JGB dictum that, 'There are not beings who do things but doings that be things'. It is perhaps hard for us to think in terms of something being done without an entity doing it – after all, our whole human

social context is fixated on the idea that humans do things because they are free or something nonsensical like that. This was a crux of Gurdjieff's insights, too.

In the mathematical example we have a kind of recurrence that is *active*, and we used the term 'operation' related to 'operator' meaning a factor that acts on states or data. Simple arithmetic with plus, times and so on is an obvious field of operations. In a computer programme there are strings of code that designate data and others that operate as instructions, etc. to process the data. There is a dynamic relation between the two as pointed out in Spencer-Brown's *Laws of Form* but that is another story.

The important thread for us is that of a *recurrent operator acting on itself*. In general we have examples of the form $X_{n+1} = F(X_n)$ which means that the next value for X is a set function of the previous value of X. This is not like the tossing of a coin in which the result of any throw is *not* dependent on the previous throw. A prime example of where it does appear is in the now famous Mandelbrot set which looks like this:



It is based on the equation $z_{n+1} = z_n^2 + c$ and shows certain values for c . The details do not matter here. What is important is grasping the sense of *iteration* as it is called, the recurrence of the same operative relationship converting a previous state into a new one 'according to law'. Also, that a structure is created at all levels of detail.

The simple equation involving X_{n+1} and X_n can evoke psychological analogies. An intriguing one – though pure speculation – is that there is an *equation of self-observation*: in this phenomenon there is not one thing looking at another thing, but the 'same' thing looking at itself. The act of observation changes what one is. But one is still the 'same'. Note that there is not an infinite regress as in the usual verbal confusion of supposing we have one 'I' observing an 'I' in its turn observed by an 'I' and so on and so on. The iteration can *converge*. It depends on the relation involved in the act of self-observation. We can appreciate that when the 'I' (X_{n+1}) sees the 'I'

(X_n) in the operation of self-observation the 'I' is both. This can only be true in respect of *will* not of being. Will is a relation, not a state.

In an observing system, what is observed is not distinct from the system itself, nor can one make a separation between the observer and the observed. The observer and the observed stand together in a coalescence of perception. From the stance of the observing system all objects are non-local, depending upon the presence of the system as a whole. It is within that paradigm that these models begin to live, act and enter into conversation with us.

'Reflexivity, Eigenform and Foundations of Physics' Louis H. Kauffman in *Reflexivity- Proceedings of ANPA* 30 June 2010

According to the structure of the operation, observing oneself can vary greatly. In one mode, it increases our fragmentation, e.g. because we react against what we see. In another, it is an act of integration and we become more 'truly' who we are. This is to speak of something like 'degrees' of hyperaxis. There are intermediary modes of hyperaxis as suggested in the following abstract:

Two experiments examined the effects of videotape feedback and self-observation on children's problem solving. The first experiment examined children's performance on the Tower of Hanoi problem, and demonstrated that video self-observation promotes the acquisition and transfer of procedural knowledge necessary for problem solving. The study also found that specific information presented during the video presentation was not as important as the children seeing their actual prior performance on the problem. The second experiment examined *the type of information that may be operative during self-observation*. These findings narrow the range of possible explanations for learning through self-observation and, in general, suggest that the positive effect of self-observation is due to *active observation of one's own actual performance*. [Italics ours]

'Self-Observation and Learning: the effect of watching oneself on problem-solving performance'. Fireman, Kose and Solomon *Cognitive Development*, Vol 18, Issue 3, July-September 2003

The general idea of the cumulative effect of iterations of a simple active relationship has become a major topic of modern mathematics and science. In 1970 the English mathematician Conway came up with the Life Game. Take a look at http://en.wikipedia.org/wiki/Conway%27s_Game_of_Life for an explanation and an animated visual. We start with a few simple 'cells' – squares black or white, meaning dead or alive and a few simple rules – about when new live cells emerge and old ones die – and the most incredible and unpredictable patterns can emerge. Most times, however, the whole thing dies out. This resonates with Bennett's idea that most events 'leak away' their significance

and are lost in time while a few gain in significance and continue to develop. Thus some (a) die away entirely (b) recycle and repeat their pattern (c) maybe even continue to develop new patterns. This provides another model for hyperaxis.

Take a look at a classic example of the Life Game in action:

[Gospers glider gun.gif](#)

In the realm of self-relating operations – that Kaufman calls a ‘reflexive domain’ - entities are not the ‘solid’ things they appear to us. They are more like *moments in a process*.

An object, in itself, is a symbolic entity, participating in a network of interactions, taking on its apparent solidity and stability from these interactions. We ourselves are such objects, we as human beings are "signs for ourselves", a concept originally due to the American philosopher C. S. Peirce . . .

A reflexive domain is not an already-existing structure. Not at all. To be what it claims to be, a reflexive domain must be a combination of existing structure and an invitation to create new structure and new concepts. The new will become platforms from which further flights of creativity can be made.

Ibib.

With such perspectives we can begin to approach the meaning of hyperaxis in abstract though powerful terms. We do not start from what we assume exists and build from there. We are always in the middle of a transition from old to new, in the soil of creativity. This is the basis of our intelligence, our hopes and fears, our possibilities of encountering who we are.