

FAITH AS A PHASE TRANSITION

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On the night of 23rd November, 1654, the eminent French scientist, mathematician and man of letters, Blaise Pascal, underwent a profound experience of religious conversion. We would know nothing of this except for the parchment which he carried sewn into the lining of his doublet and which was found at his death. On the parchment was written Pascal's "Memorial" and the poem headed "Fire" which reads as follows:

FIRE

*God of Abraham, God of Isaac, God of Jacob
Not of philosophers or men of learning
Certainty, joy, certainty, feeling, sight, joy.
God of Jesus Christ.
My God and your God.
Thy God shall be my God. Truth.
Oblivion of the world and all outside God.
Joy, Joy, tears of Joy.*

Now there are many aspects of this poem which require comment. It is, of course, a translation from the French. However the following observations can be made.

Firstly, the fact of Pascal's religious transformation has been readily admitted into Western academic discourse, often with opprobrium from his fellow scientists. Documents have long been accepted as the data points which we interpolate from the vantage point of the present in constructing the past. What has not been so readily accepted into Western discourse is the ontological terminology which Pascal found indispensable from the moment of his experience onwards. The scientific Enlightenment, with its emphasis on observation, experiment and inductive inference, has wielded Occam's Razor like a sword against the visionary consciousness. That 'beings are not to be multiplied save through necessity' has often been interpreted in the case of religious psychology to mean that a low level explanation in terms of ordinary mental phenomena (and this as a mere epiphenomenon of brain function) must be found at all costs. We live in an age however, in which developments in scientific philosophy itself have made the term 'reductionism' into almost a pejorative. The 'nothing but' mentality has rebounded on the scientific consciousness. As early as 1953, for example, the American philosopher of science W.V. Quine took a full-blooded anti-realist position in regard to scientific entities, for example electrons, protons, neutrons and the whole ensemble of fundamental particles, and so on. He wrote:

"As an empiricist I continue to think of the conceptual scheme of science as a tool, ultimately, for predicting future experience. Physical objects are

conceptually imported into the situation as convenient intermediaries.... comparable to the gods of Homer. For my part I do, qua lay physicist, believe in physical objects and not in Homer's gods; and I consider it a scientific error to believe otherwise. But in point of epistemological footing, the physical objects and the gods differ only in degree and not in kind.... The myth of physical objects is epistemologically superior to most in that it has proved more efficacious than other myths as a device for working a manageable structure into the flux of experience.... Objects at the atomic level are posited to make the laws of experience more manageable..... Science is a continuation of common sense, and it continues the common sense expedient of swelling ontology to simplify theory. Physical objects small and large, are not the only posits. Forces are another example....".

I am well aware that other philosophers of science take more strongly realist views and others see unresolvable ambiguities and vagueness. I have found that non-rational elements abound throughout the fabric of science. It is no longer the purely rational activity it was once thought to be. One wonders however, why Quine made Homer's gods a scientific error. Anyone with a feeling for Western spiritual experience would, I think, put Homer's gods on a different footing than, say, characters in Dungeons and Dragons, at least on the score of the noble personalities which they produced and their attested healing powers. The gods who exist in the conscious memories of many ancient civilisations, in whatever mode, are possibly legion. The gods inhabit the foundational myths of the world's cultures. Something needs to be said, however, about the God who often built his churches on the sites of the ruined temples of the Graeco-Roman gods. Documents describing the phenomenon of Christian mystical experience bespeak a remarkable unity of fact and a remarkable diversity of expression and development. There is much acceptance today of the notion that scientific endeavour takes its licitness from the ethos of the research programme. Probably the most enduring research programme known is that of Western Mysticism. It has had many phases of both progression and degeneration in coming to grips with new phenomena and has led to the discovery of new phenomena. It has clearly established methodological rules with both positive and negative heuristic. It has a clearly identifiable hard core of accepted truth, rendered unfalsifiable by the methodological decision or experience of its protagonists. The hard core has a protective belt of auxiliary hypotheses of great variety. [I am describing the philosophy of the scientific research programme as put forward by Imre Lakatos of the London School of Economics. It is clearly the best description of the scientific enterprise yet devised]

One can dig into the research reports of the programme almost anywhere and detect both the hard core and the variety generated by individual creativity. For example, consider Simone Weil, the Jewish woman who in the second quarter of the 20th century almost made it into the Christian church. On reciting George Herbert's poem "Love" she felt the certainty that

Jesus the Christ was actually present. She says it was 'a presence more personal, more certain and more real than that of a human being. Moreover in this sudden possession of me by Christ, neither my senses, nor my imagination had any part; I only felt, in the midst of my sufferings the presence of love, like what you read in the smile of a beloved face'.

Simone Weil went on to live a new variety of ascetical sympathy with the poor and her fellow French citizens suffering under German occupation. Some would regard this as somewhat extreme and some of her enemies regard her fasting regime as suicide. In Pascal's terms, "the heart has its reasons that reason knows not of" [Penseés,277,282]

My choice of these slightly Manichaean personalities, Pascal and Weil, was quite accidental. It serves to illustrate the dictum of St. Thomas Aquinas, that "whatever is received is received after the manner of the recipient". The idea that there can be non-conceptual workings of the mind presents difficulties for psychologists in the Western Enlightenment mould. Their propensity for hypotheses of the 'nothing but' kind precludes communication with Western mysticism. If they could find the heart to accept the ontological testimony of its adepts they would stand some chance of making psychological sense out of these multi-faceted phenomena. The psychology of mysticism is an extremely young science but the imposition of categories of pathology brings conclusions which are laughable. In this respect the Freudian opus is the leader. Karl Jung is also not without fault and modern anthropological categories (save those of René Girard) are misleading. For the Christian mystic, Jesus Christ is very real indeed and this fact colours his whole inner, as well as his outer life.

In modern science we are used to the notion of one language acting as a metaphor for another with an interpretive mapping between the two, for example, mathematics as a metaphor for physics, the language of the electronic engineers bench as a metaphor for philosophy and so on. It is possible that scientific language of natural phenomena may be used as a metaphor for spiritual reality. In a sense, this programme is not new to the poet, but I feel it may have some validity beyond the merely poetic. Clearly the Creator can establish a communication link with humans by imparting to them an alphabet of signs. He has been known to use a book of words written by human hands so it is no trouble for him to use entities in his own creation as spiritual language.

PHASE TRANSITIONS.

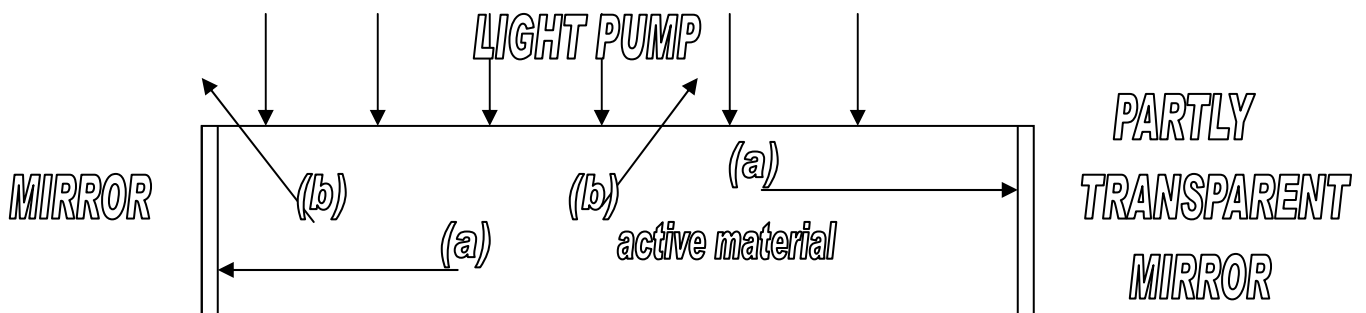
In the poem "Fire", Pascal's almost incoherent utterance marks a phase transition in his consciousness from the Rational Mode, in which he speaks of the God of philosophers or men of learning, to the Visionary and Prophetic Mode, accompanied by intense bodily resonance, in which he speaks of the God of Abraham, Isaac and Jacob, the God who does things in human experience.

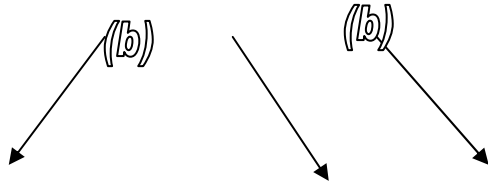
The phenomenon of phase transitions in physics is a fairly common one. A

physical system is carried over from one configuration of its physical constituents to another after passing through an intervening stage of apparent chaos and vortical instability. An example would be the process of the manufacture of diamonds (or even buckminsterfullerene) through judicious application of temperature and pressure to graphite. They are all composed of carbon atoms. The point to be noted is that there is nothing discernible in configuration A which predicts configuration B and vice versa. The changeover is quite abrupt and there are widely different properties. As far as can be seen the changeover process is non-deterministic.

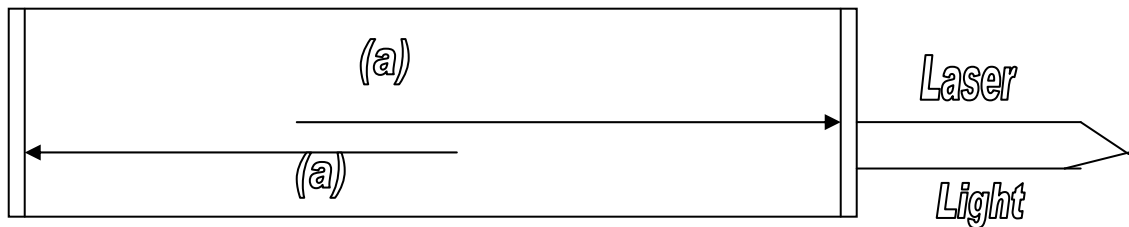
There is a more sophisticated process known as non-equilibrium phase transitions. A good example is the laser. It consists of a rod of material in which specific atoms are embedded. Usually mirrors are fixed at the end-faces of the rod, the mirror at one end being slightly transparent. Each atom in the rod of active material is excited from the outside by a light pump shining a light on it. Each atom then acts as a microscopic antenna and emits a light wave track. This emission process lasts typically 10^{-8} seconds and the wave track has a length of about 3 metres. The mirrors serve for selection of these tracks: those running in the axial direction are reflected several times between the mirrors and stay longer in the laser while the other photon tracks leave it very quickly. When the energy being pumped into the system increases the following happens: at small pump power the laser operates as a lamp. The atomic antennas emit their light wave tracks independently of each other (ie. randomly). At a certain pump power, called the laser threshold a completely new phenomenon occurs. An unknown 'angel' or perhaps an unspecified property of the 'whole' system seems to let the atomic antennas oscillate all together in phase. They now emit a single giant wave track whose length may even reach to the moon, say 300,000 km. The emitted light intensity increases drastically with increasing pump power. Dropping the pump power below the threshold causes the laser to revert to a lamp.

This can be illustrated by the following diagram:





*Photons emitted in the (a) direction
have a longer lifetime in the cavity
than other photons (b)*



There are quite profound analogies between completely different systems when they pass through an instability caused by a change in external parameters and this leads to a new macroscopic spatio-temporal pattern of the system. The laser model is particularly appropriate for Pascal's experience and also for the operation of some of the more spectacular charismatic gifts.

The collage below, which uses the symbol of water for spiritual reality, is an attempt, in interdisciplinary terms, to describe the phenomenon of non-equilibrium phase transitions in physics and the passage to the New Creation in Christian life. It is also partly inspired by T.S. Eliot's "Four Quartets", which uses the physical notion of cyclicity, as well as the symbols of air, earth, fire and water to depict Western spiritual experience.



This is a photo representation of a poster presentation in a lecture. On the left side of the collage we see a regular pattern of components, like a phalanx of soldiers come to the halt. This stands for the Rational Mode of consciousness, linear thinking, structured living, Law, (Old Testament) et cetera. At the edges of this region, as we move to the right, we see a breaking away from the established order, the non-aligned jogging the others nearby into a region of disorder, disaffection, an increase in entropy. The edges of the disordered region begin to be caught up into a vortex or whirlwind, a low "pressure" zone which swirls them around until they are drawn into the influence of the "still point" or "source point" at the heart of the vortex. From the source there emanates a new radiance which spreads from right to left throughout the whole region and establishes a higher mode pattern. The various phase transitions in water which are here used to illustrate the general process, are meant to signify the various phases in the 'stream of living water". In the pictures we see, on the ordered side, glaciers, icebergs, icefields et cetera, (these photographs come from Antarctica) Then cracks develop in the edges of the glaciers and ice-flows develop which bump and crunch against one another until the intervening water becomes warmer and the ice melts. The wind begins to blow up waves, breakers and dumpers. The sun shines, drawing up the water into vapour and clouds. The clouds carry the water vapour up into regions of coolness and this is

accompanied by a mild warmth on the earth beneath. When the clouds look most “angry” and “dark” there is an awareness of a certain “hollow stillness” or “pregnant emptiness” (of the sort often experienced by the mystic, the charismatic, just before the Holy Spirit of Jesus does something to effect a change in the Christian context. Never let it be said that God is “distant “ from his people or his creation!

On the medallion dangling from the still point of the vortex there is a poem, surrounded by fire. The poem is from Eliot’s “Burnt Norton”.

T.S. Eliot:

“Burnt Norton”

At the still point of the turning
World. Neither flesh nor fleshless;
Neither from nor towards; at the still point, there
The dance is,
But neither arrest nor movement. And do not call it fixity,
Where past and future are gathered, Neither movement from
Nor towards,
Neither ascent nor decline. Except for the point, the still point,
There would be no dance, and there is only the dance.
I can only say ,*there* we have been: but I cannot say where...
And I cannot say, how long, for that is to place it in time.
The inner freedom from the practical desire,
The release from action and suffering, release from the
Inner
And the outer compulsion, yet surrounded
By a grace of sense, a white light still and still moving.\,
Erhebung without motion, concentration
Without elimination, both a new world
And the old made explicit, understood
In the completion of its partial ecstasy
The resolution of its partial
Horror.

The German word *Erhebung* roughly means “exaltation” or “elevation”.

After the still point the snow falls. The more blizzardly the snow-fall the greater the beauty of the many and various patterns formed in the landscape . With individual snowflakes there is an amazing beauty which somehow is enhanced when the flakes gather together and we look at the landscape in large view. We see beauty in both the microscopic and macroscopic dimensions—splendour of form displayed over the proportioned parts of matter, as St. Thomas says of beauty.

Can another poem be permitted?

TO A SNOWFLAKE

Francis Thompson

What heart could have thought you?
Past our devisal
(O filigree petal!)
Fashioned so purely,
Fragilely, surely,
From what Paradisal
Imagineless metal
To costly for cost?
Who hammered you, wrought you,
From argentine vapour?
'God was my shaper,
Passing surmised,
He hammered, He wrought me,
From curled silver vapour,
To lust of His mind.
Thou couldst not have thought me!
So purely, so palely,
Tinely, surely,
Mightily, frailly,
Insculpted and embossed,
With his hammer of wind,
And his graver of frost.'

It is most important to realize that between the Rational Mode (represented by the square pattern in the collage) and the Visionary and Prophetic Mode (represented by the spreading circular pattern, signifying communal Christian life) there is no known continuity or deterministic link. One cannot ideate the phase transition.

I have, in other work, used this phenomenon of phase transition to describe paradigm change within the scientific enterprise itself, (ie. Scientific revolution), but the model has some "shortcomings" since, intuitively, scientists find the notion of a rationality gap abhorrent and that itself is irrational).

My thesis is that phenomena in science are to be used in the same way as the Old Testament is used in Christian consciousness as a rich source of analogical texts to feed the Christian mind. Christianity captures whatever is of lasting human value in paganism and lifts such general natural phenomena up into the eternal mode. It follows that the transcendent Christian mind can have a profound influence on the understanding of natural phenomena. The range of vision of the Christian mind, like the laser beam, is immense.

There is a wonderful story in the Book of Deuteronomy which gives an analogy of the relationship between scientific insights and their use in the laser light of living faith. It is the story of the beautiful woman captured in battle. Remember that Woman is the archetype for Wisdom in the Old Testament:

“When you go to war against your enemies and Yahweh your God delivers them into your power and you take prisoners, if you see a beautiful woman among the prisoners and find her desirable, you may make her your wife and bring her to your home. She is to shave her head and cut her nails and take off her prisoner’s garb; she is to stay inside your house and must mourn her father and mother for a full month. Then you may go to her and be a husband to her, and she shall be your wife. Should she cease to please you, you will let her go where she wishes, not selling her for money: you are not to make any profit out of her, since you have had the use of her”.

Deuteronomy 21:10-14.

Thus to take a pagan wife is to incorporate her into the People of God. Science is an essentially pagan enterprise but was made viable by its incorporation into Western Christendom. But note it can be dispensed with when it ceases to be of use to the life of faith. We now know it is an enterprise which is subject to rapid change and development. It can also cease to be properly human!

In Christian consciousness, the first operation of the laser beam, may last for a considerable time. With altered pump power, it subsequently becomes intermittent, as lasers do. Frost becomes ice again with the seasons and spring follows winter (to mix our metaphors). Subsequently our lives are lived in a paradoxical world with two phases. These two phases are found to be complementary, compensatory and indeed compassionate to one another.

The table below contrasts The Rational Mode with the Visionary and Prophetic Mode. It contains just a few elements of contrast. The table could be continued indefinitely to cover every aspect of the New Creation, the new humanity.

The Rational Mode, also referred to as the Manipulative Mode or Make-it-Happen Mode of conscious action is characterized by EROS.

The Visionary And Prophetic Mode is an Emergent Mode of Consciousness or the Let-it-Happen Mode. In the Christian context it is characterized by AGAPE and FILIOS. LOVE is a many splendoured thing!

RATIONAL MODE

- (1) Split between Object and Subject
--“distancing.
- (2) Detachment, “othering”,
disengagement, disentanglement.
- (3) Observer a stranger,
Non-participant, external observer.
- (4) Arms-length transactions—
alienation.
- (5) Clinical judgment- neutrality.
- (6) Self-knowledge plays no part in
The cognitive process.
- (7) Interchangeability of knowers.
One as good as another.
- (8) Truths ‘discovered’ are Objective.
- (9) Observer unchanged by new truth.
- (10) I- It. (Buber)
- (11) Active mode, theorizing,
Hypothesizing, conjecturing,
Classifying- Making-it-Happen.
- (12) Concentration—attention—
Purposeful.
- (13) Rational—verbal—
Conscious awareness.
- (14) Perception without caring.
Emotions not to be trusted.
- (15) Graphs and records, readings,
Seminars, lectures etc.

VISIONARY AND PROPHETIC MODE

- (1) Unity of knower and known.
Knower “becomes” the known.
- (2) Loving (the being), identifying,
Sympathizing, connaturality.
- (3) Observer a participant, a sharer.
- (4) Empathetic transaction, sharing,
Identifying.
- (5) Lover’s judgment, ie. Folly.
- (6) Self-knowledge an essential part of
the cognitive process.
- (7) Non-interchangeability of knowers.
There are great knowers and poor
knowers.
- (8) Truth participated in is personal.
Subjective.
- (9) Observer changed by new truth.
- (10) I-Thou (buber)
- (11) Passive mode, receptivity,
Non-verbal grasp of reality.
Letting-it-Happen
- (12) Peripheral awareness, patience,
Waiting, preconscious activity.
- (13) Non-rational, non-verbal pre-verbal
Consciousness, vague awareness.
- (14) Acceptance “as things are” with
caring. Joy or sorrow. Appreciation.
- (15) The known cannot be depicted
Diagrammatically. Songs, poetry and
dance.