<u>How</u> Purposes can be Powerful

Ian J. Thompson, Physics Department, University of Surrey, U.K., September 2004.
I.Thompson@surrey.ac.uk

We all know how wonderful it is to have a life leading (or being led by) a visionary purpose. This competition's many essays and personal testimonials are witness to that. In the Scientific Investigations reported, we should also have seen much evidence that points to natural purpose and its order.

But do we *understand* what is being demonstrated here? We want to believe that purpose is powerful in human lives and probably in nature, but many of us also believe in a science which knows nothing about purposes, and which leaves little elbow room for purposes to have any effect! We want to believe *that* purposes are powerful, but we do not really see *how* this can be so. What is *really going on* when purposes influence the world? What is the truth here?

We have deep problems as we try to form our sciences. We believe and intend that purposes are effective, but we do not really know how to connect this insight with our theoretical and empirical knowledge in the sciences. We may have a good idea how purpose makes its mark in the religious, social and psychological realms – as all the competition essays attest – but as yet we have no good idea *how* purpose can be effective in biology and physics. These two sciences are concerned with *detail*, and our details so far are missing. This essay seeks first to justify this summary of our current predicament, and then to convey a new vision of how purposes may be powerful, and become real causes, in both the human and the natural worlds.

What does not exist cannot have any power. So, if a purpose is to have power, it must exist, or it must be related to a causal aspect of what does exist. Otherwise it would be a powerless epiphenomenon. Let us consider the preliminary possibility that only natural things exist, so that powerful purposes might be discoverable as aspects of natural causes.

Does nature itself act with a purpose? To form a precise question, consider nature according to accepted physical laws. Some physical laws portray something *like* 'purpose'. There are laws of conservation of energy, laws of thermodynamics, and variational principles. All these laws appear to describe the *reasons* for the actual operation of nature. Physicists say that 'entropy must never decrease', and that 'nature seeks the least action', because of laws like these. However, physicists have looked at the above laws, such as the variational principle, and emphasize that it is *not* the case that nature explores possibilities like humans do when thinking. In all cases, to ask for the power of purpose according to the physical sciences is a tall order, since physics knows little or nothing of those purposes we hold dear.

In another approach, many people believe that modern physics leaves small gaps through which purposes may yet creep in, by means of the Heisenberg Uncertainty Principle and the indeterminism of quantum physics. Physicists from Eugene Wigner[1] to Henry Stapp[2] have suggested that mind can influence nature at the point of measurement, by means of choosing some preferred outcome. Others, such as John Polkinghorne[3], suggest that indeterminism inherent in chaotic systems allows a similar process.

However, while quantum physics may be indeterministic about the detailed outcomes for some classes of microscopic events, namely decoherent measurements, it is not completely arbitrary. Rather, it makes *very precise predictions* for the *probabilities* of those outcomes, and, furthermore, the time evolution of these probabilities is completely deterministic. Purposes might allegedly choose *when* decohering measurements occur (as Stapp suggests), or perhaps change the probabilities of different outcomes. In the first case, the scope of influence is extremely limited, and hardly plausible as a means of expressing powerful purposes. In the second case, purposes would change the probability rules of quantum physics, in just the same way that they would have to change Newton's laws of motion if they were to influence classical systems. The long-term conservation of energy and momentum remains just as constraining as before. Modern quantum physics by itself, therefore, leaves only miniscule and insufficient gaps through which purposes may be effective.

So let us for a while suspend science's natural cautiousness and its 'methodological naturalism', and consider the possibility of a new 'science of purposes': a new programme of research that includes and builds on modern science, though without its monist prejudices. We should not be timid or ashamed about this, or feel that we lose the ground we stand on. Perhaps scientists might worry that 'anything goes' if we do not stick with the foundations we know, so we will need an extended view with *definite structural principles,* and these should include (something like) current physics as a limiting case. We seek an account that allows purposes to be causes, while agreeing with the structures, events and processes that make up physics, chemistry, biochemistry and biology. There may possibly be disagreement only about the underlying causes.

This is of course, to start with, an intellectual exercise, but such an exercise has its uses. Many of us have seen evidence for powerful purposes: in ourselves, and elsewhere. But evidence for *what*, exactly? We need a detailed theory here, one that could be verified or refuted like other scientific theories, and fail or prevail. A theory would link disparate pieces of evidence together, and then we think we *begin* to properly understand. Parapsychology, for example, has stagnated from the lack of such a theory. A new theory would make predictions. In fact, many experiments only suggest themselves *after* a theory is under scrutiny. What is shameful is that we do not yet have even a *possible* such theory. This portrays a serious lack of imagination on the part of us theorists! Let me tell you, therefore, what my vision suggests for such a theory. Then let us, like good scientists, judge by the results.

☼

A new account is based on several principles taken to be universal, some of which exist already in today's science. Since I must be brief, consider the following points:

1. Particular objects in the world exist, and all are composed of some substance in some form. *Pure* forms without substance cannot exist, whether they be information, mathematics or functions.
2. All existing things have irreducible causal powers: probabilistic dispositions or propensities are an essential part of the nature of everything existing.
3. For simplicity, take the *substance* of a thing not as something unknowable, but as the *underlying disposition or propensity* from which, according local structures, all its other dispositions and causal properties may be derived.
4. Every microscopic operation consists of generative 'discrete degrees' (read → as 'gives'): propensity itself → propensity in a distributed form → event.
5. Each stage or degree is like a 'part,' and exists in its own manner.

The above principles are arguably the foundation of a realist interpretation of quantum physics, as discussed further below. The essential dispositions of an elementary particle are the propensities characterised by the charges, masses and other quantum numbers that determine its capacities and probabilities for interaction. Now for what is new:

6. Each stage of a generative triple is *itself* composed of parts with this three-fold structure. Thus we have a recursive structure of embedded details like a fractal. The next level of detail, for example, would be an ennead of nine sub-degrees.
7. Physics and nature as we know them are not the whole picture, but are in fact 'merely' the 'event stage' of a bigger picture operating with the same structural principles.
8. The 'big picture' has a triple that is more commonly known as:
   'soul' (propensity itself) → 'mind' (propensity in a form) → 'body' (visible events).
9. At this global level, the 'propensity' should, if you are happy with this terminology, be more accurately termed 'spirit' or 'love', and only the 'body' stage regarded as 'natural' and visible to physics.

Perhaps scientists imagine that there is no need for this kind of scheme, but we are already suffering from a *lack* of precisely such universal ideas from philosophy. This so far is a relatively simple vision that, like a fractal, points to expanding vistas of complexity on closer examination. Unlike a fractal, this scheme points to expanding ranges of *quality* within. Let us see some details.

All stages are individually objects composed of some propensity (substance) in some form. This applies to 'soul' and 'mind' as well as to the natural world. Each is a really existing object (by principle 5) with causal powers (by principles 1 and 2), at one of the following stages:

- The soul itself (by principle 6) has itself three 'heavenly' sub-degrees:
  'spiritual love' → 'wisdom' → 'faithfulness in action'.
- The mind itself (similarly) has three 'mental' sub-degrees:
  'interior mind' → 'scientific discursive mind' → sensorimotor mind.
  - Each of these has three parts, very probably as Jean Piaget[4] and Erik Eriksson[5] have begun to describe in their stages of cognitive and affective development.
- The natural body itself has three 'physical' sub-degrees:
  pre-geometric processes → virtual processes → actual processes.
  - 'Pre-geometric processes' have themselves three parts:
    but as yet only speculation, in for example loop theories of quantum gravity.
  - 'Virtual processes' have themselves three parts:
    Lagrangian variational → virtual fields → coherent virtual events.
  - 'Actual processes' have themselves three parts:
    Energy operator (Hamiltonian) → wave function → decoherent actual events.

The above is a structure of recursively embedded discrete degrees that could be expanded upon in much more detail. Consider some degrees as examples.

The final triple for 'actual processes' shows the operation of the Schrödinger equation and decoherence, the most basic dynamism of quantum physics. Physical energy is active, so is represented as a mathematical operator which generates the space and time distribution of the wave function as constrained by initial conditions. This distributed wave function, after some finite time, produces actual events as the selection of one outcome among many 'decoherent alternatives,' as constrained by previous selections. The precise nature of these selection events is so far only known in rather extreme cases involving medium and large objects, so there is new physics to be discovered here.

The overall structure of the 'physical degree' is currently much debated among physicists. There is general agreement that the energy and wave functions appearing in the 'actual process' degree are not simple, because kinetic energy from mass and potential energy from interactions are both dynamically generated by the virtual processes of quantum field theories. However, there is no good agreement about the most fundamental stage of what gives rise to *these* virtual processes, and, especially, what gives rise to the space-time background for virtual events. I mention loop quantum gravity, as one attempt to explain how space-time areas and volumes might be produced. There are many speculations about quantum gravity, and how space-time might be dynamically generated, but there is little agreement even about what such a theory should look like. I hope that my present scheme would enable some general principles to be elucidated that might guide theory formation, and enable eventually a realistic interpretation to be found.

The triple for 'mental sub-degrees' shows the steps by which deep motivational principles in the interior mind – purposes – lead to action. These purposes come to fruition by means of discursive investigation of ideas, plans and alternatives in the more exterior 'scientific discursive mind', as constrained by existing intellectual abilities. The actions by the sensorimotor mind select one outcome among many, as constrained by bodily conditions. Moreover, psychologists who have investigated perceptive and executive processes within the sensorimotor stage realise that these are far from simple. What we see, for example, is very much influenced by our expectations and desires, as well as being constrained, of course, by what is in front of our eyes. They would agree that there are subsidiary degrees of expectation, presentation of alternatives and resolution even during 'simple' sensations.

In order to encompass the above examples of operation in both physics and psychology, let me postulate the following dynamical principle to apply universally at all levels. The basic principle could be called 'conditional generative causation', according to which:

10. Changed propensities in each degree are generated by prior propensities that act according to what is already actual in both the current and subsequent degrees.

Each degree is therefore activated by 'influx' from prior stages, while the present range of actualities constrains what influx is possible, and also how propensities change at those prior degrees. The new science of purposes sees, therefore, a whole multi-level structure linked everywhere together asymmetrically: by influx from 'above', and by constraints from 'below'. The propensities (loves) of the very first degree are constant. The final degree of actual selections in nature has no potentialities for changes to itself, so it is the cumulative 'bottom line' that is fixed and permanent as history, and therefore acts as kind of ultimate container to all previous degrees.

Note that there are detailed constituent events in both of any pair of prior and produced degrees. Because of all these microscopic events, there will be successive influx from the prior degree reciprocating with sequential constraints by the produced degree, and this alternation will repeat itself longest if the *patterns* of the constituent events are most similar in the two degrees, and they do not get out of step. By a sort of survival of the fittest, this in the long term gives rise to *correspondences of function* between adjacent degrees. We may conversely say that the functions in distinct degrees sustain each other in a kind of resonance when they are most similar in the patterns of their constituent events. Our minds and brains sustain each other by influx and constraint, for example, when psychological and neural processes are most nearly isomorphic to each other in their functional description. There is much detail here to be learned by derivation and observation, not just in mind-brain functioning but

throughout living organisms. Discrete degrees are not of a continuous substance with each other, but, we see, have functional relations that make them 'contiguously intertwined' at all stages, and at all levels of detail at each stage.

How, in this vision, do we link with the physical degrees, and how do purposes work in the apparent face of physical laws? Here, they do not squeeze through any gaps in our explanations, but work through the normal processes by means of which physical propensities are all originally generated from prior loves. They follow this flow of influx, modifying it as allowed by the constraints of what is already fixed at each stage.

For physics, this means that the 'deepest principles', such as the Lagrangian subject to variations, and presumably the even deeper theories of quantum gravity, will have certain parameters that depend on prior discrete degrees in the rational and sensory minds. This is a new result in our science of purposes. Does it break physical laws? First note that, on the realist position here of objects being composed of all their propensities, physical laws are identical with the description of how these propensities in fact operate. Quantum electrodynamics, for example, describes how electrons of certain masses and charges interact with each other and with photons. We need another law to say how the propensities may themselves vary, or not vary. The details are part of the general theory, still to be found, of pre-geometric processes. Do we know for sure that the electron charge is constant? Physicists have in fact imagined slow variations of this (the fine structure constant), but are we allowed to speculate about local more rapid variations on neurological time scales? The meaning of the laws of conservation of energy and momentum would have to be reconsidered in such a situation. Presumably, physicists would conclude that the system in question could not be considered sufficiently isolated.

A good new theory must allow a natural world that is not an illusion, nor just the product of human minds. It should also be consonant with our best accounts of psychology and theology. The power of purpose is not omnipotent, as in some New Age stories, for in fact there is often resistance to the elaboration of purposes. A good theory must explain the phenomenon of 'contrary tendencies': of limitations as well as of empowerments, and of bitterness as well as love.

Purposes, in this vision, are produced by particular forms of love – particular affections – as these generate the next stage of thought, and begin to be worked out in particular forms or ideas in the mind. We would thus distinguish the loves of good things from the purpose or intention that works towards achieving them.

Purposes therefore become powerful by working through, and modifying, the normal routes by which loves and thoughts work through all of the pre-geometric and virtual stages towards actual effects. Depending on what has already actually happened in ourselves and in nature, purposes generate thoughts and plans, and then also physical potentialities for the desired actual outcomes. Sometimes historical actualities facilitate purposes by providing the materials for the accomplishment of the end. At other times, they may slightly (or sharply) limit the range of possible actions, and thwart the working out of prior purposes. Such frustrating situations must be worked around, or limited cooperation sought, since history cannot be abolished. That is the deepest challenge for those being led by good purposes.

A theistic theory may possibly be based on the above scheme. This would take all of the above, but now, as activated by an 'influx of propensities' from the Divine Source in a manner similar to the way

that discrete degrees sustain each other. This would also explain how to sustain inanimate nature apart from living creatures. The whole soul/mind/nature 'created structure' would not be self-sustaining, but all its processes and sub-processes would come themselves to have eventually a functional form that is an image and likeness of the details of the Source. The Divine would presumably be a unity that has infinite and perfect details. It (He) would again not be of a continuous substance with creation, but of a distinct discrete degree that is yet intertwined and ultimately sustaining at all stages of every particular finite object, "rewarding each one according to his ways and according to the fruit of his deeds"[6]. He "sends rain on the just and on the unjust"[7], and we only vary in our reception depending on how our historical actions give present constraints. This may be already known to many of us – the challenge is to enable connections with the rest of our knowledge about nature as well as about people.

☼

Maybe it is too soon for these kinds of ideas to be accepted in science, since not all the simpler options have been examined and found wanting. My aim here, therefore, is to demonstrate in a sort of existence proof that it is *possible* to have a scientific theory of mind and purposes which is coherent with good physics and good psychology, while also being spiritually plausible. This is not a mathematical theory, but is more an elucidation of what general ideas could replace those of 'particle', 'wave' and 'field' to describe the substances by means of which we interpret our equations, and what kinds of structural and dynamical relations the new substances should have.

Where do we have to search in history for a vision along these lines? Antonio Damasio[8] recently found fruitful similarities with the works of Baruch Spinoza (1632-1677) for his vision of unified mind and body. I do not need to go back that far, as I find the essentials of the above ideas already in the writings of Emanuel Swedenborg (1688-1772). With Swedenborg[9], the ideas are firmly embedded in a radical reworking of Christian theology, philosophy and psychology, but we need now at least similar concepts to help form new scientific theories.

The ideas discussed here should not just remain in books long ago published, in our imaginations, or in short essays of today, but must be expanded and examined for explanatory and predictive power, to enable the development of a new science of purposes. Empirical testing then becomes practicable. Then, and only then, will we have demonstrated *how* purpose in a vision has power in a life, to struggle against (and with) the limitations of what already exists and who we already are. Then, to the benefit of all society, we will know for sure how inspired purposes in our lives have power within both our human and our natural worlds.

Bibliography

1. E. Wigner, "Remarks on the Mind-Body Question," pp. 284-302 in *The Scientist Speculates*, I.J. Good (ed) Basic Books, 1962.
2. H. Stapp, *Mind, Matter and Quantum Mechanics*, Springer-Verlag, 1993.
3. J. Polkinghorne, "Chaos Theory and Divine Action," In *Religion and Science: History, Method, Dialogue,* ed. W. M. Richardson and W. J. Wildman, Routledge, 1996
4. J. Piaget. *The Language and Thought of the Child*, Harcourt, Brace & World. 1926;
   J. Piaget, *Play, Dreams, and Imitation in Childhood*, Norton, 1962.
5. E. Erikson. *Childhood and Society*, Norton, 1963.
6. Jeremiah 32:19
7. Matthew 5:45
8. A. Damasio*, Looking for Spinoza: Joy, Sorrow, and the Feeling Brain,* Harvest Books, 2003.
9. E. Swedenborg, *Divine Love and Wisdom*, 1763: Swedenborg Foundation, 2003.