

G R Little philosophy overview

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The papers at this site are the exploratory works making clear in some detail the points and principles of the philosophy and intellectual position of Dr Graham Little. At the heart of the philosophy is a universe defined and understood by events able to be observed by sentient species. For humans, this fundamental perceptual structure links the observer to the event and enables grouping of events by properties so creating sets or classes of events which are then called ideas, and finally enable linking of ideas into mental models enabling prediction and control of the environment and so greatly enhancing the likely survival of the species. This overview paper summarise the key ideas and offers them in a sequence providing clear understanding of how the ideas build and how the solutions integrate and lead into the practical consequences.

The aim of the work is to establish clear and unequivocal answers to questions such as:

- How do we understand why we do what we do? And would common understanding improve how we relate to each other? And how would it help people lead more fulfilling lives?
- How do we draft long term and effective mental health policy that gets results?
- What is mental illness and insanity?
- What causes violence in society and can it be moderated?
- How do we understand social development, and can it be deliberately managed without reverting to social engineering of some particular political persuasion?

The overall approach to these questions is via theory, namely seeking to integrate known insights and understanding and create complete and full theories that account for the data and lead to the answers to the practical considerations as above. This approach is based on the view that understanding depends on creating conceptual models that integrate and explain and that empirical research can only provide information, or knowledge, it cannot of itself offer insight or understanding. While these views are sound, there are many, many practical issues if they are to translate into effective intellectual process.

The paper makes no attempt at detail and is not tightly referenced to the main papers. Thus this paper sets out to achieve the limited aim of providing insight into the overall conceptual structure of the work of Dr Little.

Purpose

I have often been asked 'why is this philosophy so important to me?' I have spent over 30 years of (part time) effort in pursuing answers to questions often not even seen as questions. Why bother? In these brief comments I will try and offer some explanation of why it was important and why it took so long.

First I wondered what we are. Began to think of humanity as a 'species', then what was it that made us 'human', and how could that be understood? I believe this important in many ways, but perhaps most for the insight it offered to each of us individually. The process of understanding ourselves was in my view initiated by understanding what we were, since each of us is merely an example of what we are as a species.

Closely intertwined with this search of an explanation of what we are is the question of who we are. But this must inevitably carry us into details of individual experience and personality. The only general aspect of 'who we are' that relates immediately to 'what we are' is the question of our spirit or soul. Is it necessary in explaining what we are to include a soul, or can we find full and detailed causal explanation of what we are without including a soul in the explanation? And if we find explanation without a soul, what does that do to our long association with religion and with ideas of God. It is almost passé to identify religious belief with some of our worst conflicts and atrocities, the rational argument on the worth of religion being something in balance depending on whether you are for or against. Regardless, the idea of finding lasting solution to the question of what we are and exploring in the process the possibility that full and complete answers could be generated without a soul of was immense interest to me, and I believed of immense long term practical value to our global understanding of what we are. Could better understanding of what we are melded into better insight into who we are and how much we are all alike – could such understanding moderate the prejudice so often associated with of religious views? A tempting question I could not forsake.

Second and clearly evident in the comments above I needed deep and careful intellectual understanding of what I was doing. I scoured social science but could find no tools for applying to my quest that came even close to the rigour and intellectual thoroughness I instinctively knew was needed (the reason I knew so was because of lack of such answers in social science, and reasoned that if tools adequate for the task existed then someone would have used them, they had not, ergo the tools did not exist, but I did double check). The questions of science crowded in hard and fast as soon as I begun the search for answers over 30 years ago: What did I mean by cause? How did it apply to social science? Could I find a theory of cause without defining a theory of cause suited to all science? Was social science different? How and why? What of the interpretation of modern physics and the implied causality or lack of in quantum electro dynamics? Could I just ignore that? Then beyond this obvious set of questions there remained even deeper issues, for example if I wanted to create a model (or theory) of what we are, this had to relate to the object, namely humanity, or some generalised idea of a person; but this was a specific case of relating some particular knowledge to the object of that knowledge so how could I do that without knowing how all knowledge in general related to the objects of that knowledge? And further, knowledge was created by humans, so how could I understand the relation of something created by us to the objects we saw and noted without understanding the processes whereby this occurred? In short how can you really understand knowledge without a general theory of psychology which explains how knowledge comes to be? I realised in needed a general theory of knowledge and specifically of science and causality within that theory before I could define and refine the tools I needed to even begin my search to answer the questions I could see needed answered.

The search for intellectual tools was merely one aspect of the emerging complexity. I had come to understand the link between a topic and the preliminary items needing resolved prior to direct consideration of the topic, the principle I called 'first things first'. Also I had come to understand the circular links between the key issues:

- The aim is to establish a general theory of the person that describes the causal forces in human mood and conduct.
- But to develop a causal theory of the person we need to understand cause.
- What we know of cause is knowledge, therefore if we are to establish an accurate theory of cause we need to better understand knowledge.
- Knowledge is created by people, so to really understand knowledge we need a general theory of the person.

I understood that each topic was related to the others, and that the solution to one topic would influence the solutions to the others. The topics could not be addressed singly or independently. The only process able to achieve that was iterative; the solution to one had to integrate to the solution to others. It was getting complicated, and by now I was some twelve years into my project and I had not really started.

Finally, and beyond the items above, I could see that if I successfully answered the questions as set, I would build a causal explanation that would immediately enable insight into how our individual causal forces that shape us aggregate into causal explanation of our social structures and provide clear causal links between the social forces and our individual psychological forces. Are there practical consequences from better causal insight into social changes and the links between such social changes and individual behaviour and vice versa that is individual changes and the links to social development? I think so, with potential impact from government policy, for example on mental health, through ethnic policy - for example what is multiculturalism, what does it mean and how do we best understand it; to economic policy with better insight into the levers whereby individual behaviour is impacted and so social economic trends moderated.

One insight is both first and last namely that we as a species 'see' not through our eyes but through our minds. This insight is first in that it drives the search to create better and sharper social policy, to moderate prejudice over inappropriate issues, to find balance between the causal forces operative within our psyche we need better and clearer and more effective ways of 'seeing' the issues, we need better models or theories that better explain to us what is going on so we may better manage the issues implicated. This insight is also last, since while it drives the start, it demands thorough explanation in the end to validate its pre-eminence at the start, and this explanation must be without bias or prejudice from the start, so we do need those thorough tools to ensure no bias, no prejudice, and deep and thorough understanding of what we are doing conceptually with each and every step. Without the tools enforcing the strategic and ethical control, precision, thoroughness and offering certainty that the resulting creations are solidly grounded on basement, no flavour of the month, but deeply grounded irrefutable analysis – without the tools, then I become yet another philosopher offering another set of opinions and prejudices, I decline such an epitaph so I did the work, you will yet judge its merit.

In summary the questions I set out to answer so long ago are:

1. If we had a complete and thorough general theory of knowledge what would it tell us of the structure of knowledge, and the relationship of all knowledge with the objects of that knowledge?
2. If we had a complete and thorough general theory of the person what would be its structure and what could it tell us of the actual people in some actual situation?

3. If we had a complete and thorough general theory of society what would be its structure and what could it tell us of the actual societies in some actual situation?
4. What are the relations between the first three questions?
5. What do the answers to the first four questions offer in explanation of the human spirit and its influence and impact on the human condition?

So begin to follow my journey as I now describe it, but not in the manner of it happening. It took thirty years. The intellectual answers are largely complete. Unravelling the practical consequences and propagation of the solutions now begins in earnest.



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1. First principles

- 1.1. **Strategy in intellectual thinking.** Strategic thinking in science is application of the rule 'first things first', the rule states that no topic can be discussed beyond the bounds defined by the current solutions to the issues of ground in which the topic is embedded. Strategy in science gives rise to interrelated problem situations.
 - 1.1.1. The need for effective strategic thinking is the core constraint guiding the ethics of science.
 - 1.1.2. Application to the strict strategic rule of 'first things first' defines serious intellectual endeavour and so defines science, and that scientific ethics are intrinsic to science with the scientist being a person who follows the ethics intrinsic to the rule first things first.
- 1.1. **Problem interrelatedness.** Problems do not exist in isolation and can only be resolved in relation to the existing ground in which they are embedded.
 - 1.1.1. For example, the interrelatedness of the issues of a general theory of psychology, general theory of causality and general theory of knowledge with each issue being part of the ground for each of the other two issues.
- 1.2. **Rule of relations.** The rule of relations states a relationship between two objects can only be established if and only if the objects can be independently verified and perceived as events by the sentient species.
 - 1.2.1. The rule is profoundly important in dealing with the existence of Reality beyond our senses, for example how can anyone separate the image of Reality - our personal reality - in mind from Reality? (The capital is used to signify the naming of 'something', in the way we use capitals for New York, or Beirut.)
 - 1.2.2. The rule of relations is also crucial at the limit of knowledge, so if we see a horse in a paddock we can separate the horse from the paddock. But when we 'see' a photon, we are not able to separate the photon from the environment in which it is, therefore cannot in principle assess the links that photon makes to its environment.

2. Perception

- 2.1. **Location of the start point.** What must be the state of the universe for perception to be possible?
- 2.2. **The intellectual process.** What is the minimum level of perception beyond which there is no perception?
 - 2.2.1. Clear air white out in practice, and Ganzfeld effect in the laboratory.
 - 2.2.2. We best understand Ganzfeld experiments as saying crucial things on the nature of Reality (the environment) in relation to perception within that environment and not as an aspect of Gestalt and/or parapsychology.
 - 2.2.3. Both clear air white out and Ganzfeld are neuro-physiological circumstances and are not understood at all from within a view of psychology, in summary they are not psychological phenomenon at all.
- 2.3. **The scientific conclusion.**
 - 2.3.1. It was stated in the literature, arising from Ganzfeld experiments that perception failed in an undifferentiated perceptual field. This was supported by clear air white out studies.
- 2.4. **The scientific extension.** For perception to be possible the universe must be differentiated with respect to the perceptual modality.

3. Initial ontological structure

- 3.1. **Existence of a Reality.** Reality (capital 'R') is the universe behind the perceptual field.
- 3.2. **Process of perception.** Reality generates a perceptual field able to influence the perceptual modality of the observer.
- 3.3. **Definition of reality (little 'r').** The perceived state of Reality arising from the process of perception.
 - 3.3.1. There is no justification in assuming reality is congruent with Reality, for example modern virtual reality, or in circumstances of clear air white out for example the Air New Zealand Mt Erebus disaster where over 260 died when pilots did not realise they were flying directly into the side of Mt Erebus in the Antarctic with clear air white out a major contributor to the disaster.

4. Structure of Reality

- 4.1. **A differentiated Reality.** The observer independent elements are derived from the fundamental and necessary differentiation of the universe.
 - 4.1.1. The fundamental postulate is that in the absence of a differentiated perceptual field relative to the perceptual modality of the observer there is and can be no perception. (This arises from the logical converse of the statement by Cohen "It may be conjectured that the perceptual mechanism has evolved to cope with a differentiated field, and, in the absence of differentiation, there is a temporary breakdown of the mechanism". Cohen, W. Spatial and Textural Characteristics of the Ganzfeld. Am.J.Psych., 70, 403-410, 1957.)
 - 4.1.2. The Ganzfeld then become integrated into Gestalt and papa-psychology and the point was lost.
 - 4.1.3. The Ganzfeld has nothing to do with psychology; it is totally a physical phenomenon of immediate perception (see below for the definition) which we are totally unable to control.
 - 4.1.4. The Ganzfeld phenomenon is a statement about the nature and structure of the environment for perception to be possible and is the laboratory equivalent of clear air white out.
- 4.2. **Necessary and sufficient differentiation of the universe.**
 - 4.2.1. If the environment must have a certain minimum level of differentiation for perception to be possible, then it must be possible to assess the nature and structure of that differentiation.
 - 4.2.2. The minimum differentiation to sustain perception is as follows.
 - 4.2.2.1. Spatial differentiation. Location in space.
 - 4.2.2.2. Aesthetic differentiation. All perceivable differences.
 - 4.2.2.3. Dynamic differentiation. Change.
- 4.3. **Immediate perception** is the term used to describe the fully physical process of a change in Reality generating a change in the perceptual field generating the change in the perceptual modality of the observer.
 - 4.3.1. It is well understood that sight perception is driven by photons. To understand the process as presented here, look at the wall opposite you, then visualise the photons leaving the wall in a wave every millisecond (this is not how it happens, but allow this to follow the point).
 - 4.3.2. Within each 'wave/wall' of photons every photon is unique (1) electronic uniqueness through coordinates of frequency or wave length, or spin or all three,

and (2) as a result of unique location in space (assuming no two photons are able to occupy the exact same point in space.)

4.3.3. In this way each 'wave/wall' of photons when interacting with a perceptual system able to interpret the photons as above, generates a visual reproduction of the actual wall.

4.3.4. In the case of clear air white out each wave of photons reaching the eye consists of photons not differentiated electronically, only differentiated by their location in space, so each photon is still unique, with the result we actually 'see' a white one dimensional 'wall', with complete loss of depth perception, where we can think we still see empty three dimensional space.

4.3.5. It is crucial to understand that this process of 'seeing' the wave of photons immediately striking the eyes is instantaneous, and is not able to be moderated by any act of psychology; it is the physical operation of immediate perception.

4.3.5.1. So the pilots of the ill fated Mt Erebus disaster would have looked to the right or left and saw a 'normal' three dimensional view, perhaps for miles into the distance. Then as they looked forward they were immediately returned to a 'wall' of undifferentiated photons with complete loss of depth perception, and they would not know and there are no cues to signal the onset of this type of blindness so they proceeded to fly into the side of Mt Erebus.

4.4. Definition of an event.

4.4.1. Various definitions are possible, for example changes in Reality alone.

4.4.2. However, we then need label changes in perceptual field, and changes in perceptual field that generate changes in the perceptual modality of the observer.

4.4.3. A change in Reality congruent with a change in the perceptual field congruent with a change in the perceptual modality of the observer. This definition chosen has the strength of parsimony.

4.4.4. The specifying of an event immediately defines the observer.

4.5. The term **perception** is only used what immediate perception is linked to the observer's psychology and is then noted and classified.

4.5.1. Question: when a tree falls in a forest with no observer, did it make a noise?
Answer: No, there was no event, no sound, although there were changes in Reality, a tree fell, which we know would have generated pressure waves in the air, which had an observer been present, they would have heard the tree fall – but this is a explanation of the tree lying on the ground after the fact.

4.6. Each event is unique.

4.6.1. Every event is unique in relation to a particular observer.

4.6.2. In situations where the changes in Reality are observed by more than one observer, then there was a unique event for each observer. These unique events containing as a common element the observer independent changes in Reality that were the initiating changes giving rise to the events.

4.6.3. These considerations lead into issues of simultaneity and relativity. Resolving these questions demands construction of common system so time and definitions that enable comparing the same events.

4.7. Definition of an idea.

4.7.1. Events are grouped according to their properties.

4.7.2. So when an event is observed it is classified according to the exhibited properties.

- 4.7.3. A group of events classified according to their properties is called an idea.
- 4.7.4. Ideas that occur in conjunction give rise to causal expectation, and as analysed by Hume causal expectation is not justification to rationally assume that A will always follow B.
- 4.7.5. Ideas linked into sets involving causal expectation are powerful devices to enable prediction of the environment and potential control, and so ideas are powerful tools enabling species survival.
- 4.8. **Dynamic universe.** To all observers without change there are no events. It is change that is the base of the dynamic universe.
 - 4.8.1. Imagine the universe as a painting; then a person living in such a universe would see no change, yet to 'see' at all there must be change. The only change in a static universe is the changes occurring in the neural systems of the observer, these neural changes arise from the differentiation of the environment of the painting they are not changes intrinsic to the environment itself.
- 4.9. **Time:** Is the period between events and is noted only by consciousness that can be aware of that period. Time does not intrinsically exist in the universe and is solely a function of sentience. What does exist in the universe are events, and period between events.
 - 4.9.1. This view of time is not original, however what is original is the process whereby the definition of time emerges.
 - 4.9.2. What we know of time is knowledge therefore understanding time must be a detail within the broader question of how all knowledge relates to the objects of that knowledge, which in turn must be a detail within the yet broader question of how does sentience, in particular human sentience exist in the environment and what links does it make to the environment.
 - 4.9.3. It follows that any insight into time must and can only arise from a fully scientific analysis of sentience in its environment and the environment shapes and interacts with the perceptual processes of the sentient species.
 - 4.9.4. In summary: Understanding time depends on understanding knowledge, and hence understanding human psychology and perception and the processes and precursors that determine how knowledge arises.

5. Emergence of knowledge

5.1. Introduction of the observer.

5.1.1. The observer dependent elements are:

5.1.1.1. The pre-existing behavioural and emotional responses learned by the individual or pre-existing in the individual a consequence of the genetic evolution of the species.

5.1.1.2. The knowledge and experience of related events resulting in classification of the particular event according to these pre-existing classifications or the use of these classifications in analogy as a means of describing and understanding the event.

5.2. **Perception and conceptual level.** There is a 'natural level' of perception for all species. Imagine a constant conjunction $A \rightarrow B$ at that natural level of perception, and it is uncovered that $A \rightarrow C$, and $C \rightarrow B$ are the underlying mechanism of $A \rightarrow B$. There are now two systems or two levels of constant conjunction, the one being the mechanism of the other. It is this process that gives rise to the notion of conceptual level.

5.3. **Defining an event.** The base of the theory of cause is events.

5.3.1. Events are defined as the factors of immediate perception that is a change the perceptual field resulting in change in the perceptual mechanisms of the observer.

5.3.2. So defining an event necessarily defines the observer.

5.4. **Classes of events.**

5.4.1. Being immediate perception, any event is not necessarily interpreted by the observer, but **could** be so interpreted if noted by the observer.

5.4.2. Single unique and unrepeated events are of little interest, they do add to knowledge, but do not advance understanding.

5.4.3. Repeated events of similar nature become grouped by the properties of the event and are so classified.

5.4.4. Classes of events are ideas. Ideas are used to interpret the world, with the idea (generality) being used to classify the particulars of the world, so, to paraphrase Eastern philosophers, a white horse is not a horse; a white horse is an example of 'horse'.

5.5. **Constant conjunctions.**

5.5.1. After Hume regular sequences of events (B follows A) are constant conjunctions and give rise to causal expectation. They describe change relations within Reality. That is, the observer independent element of a constant conjunction is the change in Reality and/or the perceptual field.

5.5.2. Causal expectation is not cause, and is not reason to assume cause.

5.6. **Knowledge as classes of events is not ever observed.**

5.6.1. What we observe are 'instances of' some class of events. That is we only ever observe an actual event, the feeling of 'knowing and understanding' any such event is merely the result of familiarity (borrowed knowledge, after W Ross Ashby) and losing sight of the actual process in which we are embedded.

5.6.2. Another way of stating this is that we do not 'see' variables or systems of variables, only the value(s) of those variables under specific conditions.

5.7. Abstractions.

- 5.7.1. All knowledge is an abstraction from Reality, involving the grouping of events with like properties and this grouping becoming to be how we 'see' subsequent similar events.
- 5.7.2. It is an abstraction in that we may or may not 'see' or 'understand' all of the properties of some event, or 'see' all aspects of any event, or see all the links of some event to other events.
 - 5.7.2.1. Imagine the front wheels and the accelerator pedal of a motor vehicle. Now imagine that is all you can 'see' of the system and there is a link between the position of the accelerator and the speed of the front wheels.
 - 5.7.2.2. Now imagine we only know this system by those two variables. This illustrates the status of 'abstractions' and the potentially complex link they may have with their environment.
 - 5.7.2.3. This example also illustrates the impact of the rule of relations in that we can 'see' the front wheels and accelerator, and the links between, so we can see each object independently which enables us to 'see' the environment

5.8. Concepts.

- 5.8.1. Events are grouped according to the properties of that event. These properties are:
 - 5.8.1.1. Aesthetic –form, shape, colour and including other physical and chemical description;
 - 5.8.1.2. Spatial, as being in some place according to some system of reference;
 - 5.8.1.3. And the rate of and degree of change.
- 5.8.2. Thus if some frequently occurring event came to be known and labelled E, with properties E(p), then any new event with some subset of E(p), say E(p'), that is properties bearing some likeness to the typical properties of E, would be called E, or strictly an 'instance of' E.
- 5.8.3. Typically, in daily life we do not use 'instance of', thus if we attended a wedding we simply say 'we went to a wedding'. Every one knowing it was not the same wedding I went to three months ago. And while also knowing there are certain features necessary for it to be called a wedding, I would still ask 'and what was it like?' because I know it can be quite different to anything I might have attended before yet still be a wedding. So it is with all events, and all knowledge of all events.
- 5.8.4. I would not need to ask 'and what was it like' if and only if the definition (knowledge) of the event, that is the properties of it E(p) were so tightly defined as to leave no room for variation (which is the case for scientific variables and systems of variables).

5.9. Objects.

- 5.9.1. Objects special types of events with a rate of change of zero relative to the time scales of the observer. That is, things appear as objects when the rate of change is very slow as compared to the perceptual processes of the observer.
- 5.9.2. Given existing understanding of the universe it is debatable whether the universe contains any true objects. Apparent objects merely have rates of change slow in relation to the normal perspectives of the observer concerned. Thus we might refer to a rock as an object, and expect it to be there on our next boat trip. But would not be confident of it being there in two billion years.

5.10. Prior experience.

- 5.10.1. The observer dependent elements of a constant conjunction are the experiences of earlier events with the same or similar properties, where the current experience is not taken as a 'new and immediately existing event' but is categorized and 'seen' according to the experience of previous similar events. It is in this way that species (in particular humans) come to apply what W. Ross Ashby called 'borrowed knowledge', that is knowledge pre-existing the event and not derived from that event.
- 5.10.2. The impact of prior knowledge is illustrated by the phrase a white horse is not a horse.
- 5.10.3. Horse is the idea while the white horse is the particular example of the idea horse.

5.11. Conceptualisation is the consequence of a differentiated Reality.

- 5.11.1. Events are the fundamental structure of perception.
- 5.11.2. Ideas are classification of events by grouping those with like properties.
- 5.11.3. The process of grouping and linking events is the process of conceptualisation.
- 5.11.4. There are three levels of conceptualisation.
 - 5.11.4.1. Creation of ideas directly from Reality.
 - 5.11.4.2. Management of the processes whereby our knowledge of reality (our ideas) are managed and ordered.
 - 5.11.4.2.1. These are called Nouskills, for example decision making and problem solving sequences.
 - 5.11.4.3. Refining of the conceptualisation process itself. Creation and use of tools to lead the conceptualisation process (there are only two existing tools that can lead the conceptualisation process, namely mathematics and W Ross Ashby ultimate and immediate effects in conjunction with Little's analysis of variables, conceptual levels and rule of relations).

5.12. Ideas are an evolutionary advantage.

- 5.12.1. Ideas enable the following:
 - 5.12.1.1. Early warning of danger;
 - 5.12.1.2. Prior testing of actions so as stated by Popper 'ideas die in our stead'.
 - 5.12.1.3. Management and prediction of the environment.
- 5.12.2. Ideas evolved as an evolutionary response to the intrinsically differentiated structure of the universe.
- 5.12.3. The evolution and eventual development of ideas was inevitable and the processes of conceptualisation an essential aspect of all sentient species.
- 5.12.4. The level of conceptualisation (third level) enjoyed by human kind is a fundamental difference between humans and all other known species (no other known species has university libraries).

5.13. Consciousness is the culmination of evolution.

- 5.13.1. Development of third level conceptualisation is as much a part of evolution as development of legs, eye, or hearing.
- 5.13.2. There can be nothing beyond third level conceptualisation, since at that point the process of conceptualisation is turned on itself.

- 5.13.3. The survival power afforded species with all levels of conceptualisation is such that it could reasonably be said that third level conceptualisation is the pinnacle and overriding 'pursuit' or 'goal' or 'culmination' of evolution.
- 5.13.4. There can be no consciousness without conceptualisation.
- 5.13.5. In short, consciousness is the overall point of evolution.
- 5.13.6. Once consciousness in the form of third level conceptualisation is achieved, then that species has achieved the greatest level of adaptive qualities available from processes of evolution. Further development of the species is then via its consciousness not via the physical processes of evolution.

6. Model of knowledge

6.1. W Ross Ashby's ultimate and immediate effects are proposed as the model of knowledge.

6.1.1. **Primary operations:** Providing a perturbation to a system and observing how the change moves through the system according to the systems internal mechanisms.

6.1.2. **Immediate effects:** If some perturbation to a system results in some variable describing the system changing which is then followed by change in a second variable then the two variables are said to be linked by an immediate effect. Immediate effects were described by Hume as resulting in causal expectation.

6.1.3. **Ultimate effects:** If $A \rightarrow C$ and $C \rightarrow B$ are immediate effects, then the $A \rightarrow B$ is described as an ultimate effect.

6.1.4. Ashby's ultimate and immediate effects model the structure of constant conjunctions.

6.2. Classes of relation.

6.2.1. Given two types of constant conjunction, then there are two classes of relation between events. First, classes of immediate effects, second, classes of ultimate effects.

6.2.2. This has the effect of structuring knowledge into a conceptual hierarchy with some classes of relation between events being the underlying mechanisms for other classes of relation between events.

6.2.2.1. That is immediate effects are the underlying flow of change through a system that describes and represents the mechanism of the observed ultimate effects. So if $A \rightarrow B$ are observed ultimate effects, and $A \rightarrow C$ and $C \rightarrow B$ the underlying immediate effects, then $A \rightarrow B$ carries causal expectation which is then validated by $A \rightarrow C$, and $C \rightarrow B$.

6.2.3. Immediate effects underlying an ultimate effect are the mechanism of that ultimate effect.

6.3. Definition of cause.

6.3.1. The definition of cause follows as a relation between classes of relation between classes of events.

6.3.1.1. For example, when we 'see' an event, say the sun rising, we label it according to previous experiences either personal or social so it is called 'sunrise'. We know it (the sun) will travel across the sky; we call that 'day time', and will eventually set. This is all at a conceptual level, at one set of 'relations between classes of events'. If we now add the understanding of the world and solar system, we get a quite different set of relations, these relations form the underlying mechanisms of the previous set of relations, so we come to see the 'sunrise/sunset' classes of relations between events as the 'ultimate effects' of the 'immediate effects described by the mechanism of the solar system, gravity etc'.

6.3.1.2. Without understanding the underlying mechanisms, simply accepting the uppermost set of classes of relations, then we have no cause, the sun rises and sets driven by the Gods, or some other notion, there is little or no choice but make such prognostications.

6.3.2. **Sufficient cause:** We can only ever have 'sufficient cause', since to seek absolute cause would implicate every event in the universe this being beyond our

physical capacities. The extent of our 'sufficient cause' being in relation to our efforts in pursuit of causal understanding or 'truth'.

- 6.3.2.1. We assess 'cause' by unravelling the details of the mechanism whereby the observed events produced. That is, the events in question are ultimate effects and unravelling cause is to unravel the set of immediate effects underlying the ultimate effects.
- 6.3.2.2. Sufficient cause is when we decide we have enough and understand enough of how the ultimate effects were produced. There will always be more underlying immediate effects than are analysed, with the each immediate effect itself having underlying more immediate effects (since each immediate effect is in practice an ultimate effect).
 - 6.3.2.2.1. For example, $A \rightarrow B$ are observed ultimate effects, and $A \rightarrow C$ and $C \rightarrow B$ the underlying immediate effects, then $A \rightarrow B$ carries causal expectation which is then validated by $A \rightarrow C$, and $C \rightarrow B$. However, the final cause of $A \rightarrow B$ is not established, only sufficient cause, since to have the final cause of $A \rightarrow B$ requires the cause of $A \rightarrow C$ and $C \rightarrow B$. Assume we explore cause of $A \rightarrow C$, and uncover $A \rightarrow X$ and $X \rightarrow C$, so we now have more detail on the underlying cause of $A \rightarrow B$, but to get final cause we would need explore cause of $A \rightarrow X$, then explore the cause of the mechanisms underlying $A \rightarrow X$, and so on...
 - 6.3.2.2.2. A key principle is that all effects are ultimate effects, there being no system of effects that are fundamental. For any system of effects to be fundamental immediate effects, they would have no underlying mechanism and so not reducible to the underlying immediate effects representing the mechanism.
- 6.3.2.3. Consider an 'Eastern' view of cause. A man murders his wife, was the cause the manufacturer of the knife or the person who sold it to the man, or the fact the knives were retained in an easy to access drawer in the kitchen...with sufficient cause, all these factors could be considered if the consideration was thought relevant to defining the picture of the cause.
- 6.3.2.4. This analysis leads to the universal mechanistic postulate namely 'there is always a mechanism'.

6.4. Communication channels.

6.4.1. The direction of the arrow in both immediate and ultimate effect relations signifies the direction of control, nothing else.

6.4.1.1. Consider a simple pressure cooker, with gauge and release valve. The valve controls the gauge, yet the flow of energy and mass is in exactly the opposite direction.

6.4.1.2. when applying immediate and ultimate effects to complex systems, great care needs be taken and assumptions avoided as to the controlling events.

6.5. **Types of knowledge:** the definition of cause gives rise to two types of knowledge.

6.5.1. **Descriptive explanation:** Only involves immediate effects at one conceptual level.

6.5.2. **Causal explanation:** Relates descriptive explanations at one level with those at another lower level to provide understanding of the mechanisms of the description at the higher level.

6.6. Scientific knowledge.

6.6.1. Scientific knowledge arises as a tightening of the natural process whereby all knowledge comes into being.

6.6.2. For example, classifying events according to their properties, but being more systematic and more precise into the nature and description of those properties. This means that if event E has properties e1, e2 and e3, then any subsequent event to be classified E, must have exactly the properties of E, no more no less, unless some variation is known and accepted.

6.7. **Rule of relations applies to epistemology:** Can only understand knowledge by ensuring the rule of relations is intact, so we can only know what happens at the limit of knowledge by analogy where the rule of relations is retained.

6.7.1. As an analogy, imagine a TV, we can picture the TV as a black box and across the black box we can establish important ultimate effects, for example the position of the volume knob and the volume.

6.7.2. We could then describe this as $P(\text{position}) = (\text{Constant})K \times V(\text{volume})$.

6.7.3. We know that the internal workings of the TV result in this relationship, but if we did not know then we would see the relationship as describing some fundamental relationship.

6.8. **Role of constants:** Constants are the summation of the mechanism where by variables are linked.

6.9. Coherent variables.

6.9.1. A particularly significant class of ideas in science is those with only one property and are called coherent variables. A coherent variable is the simplest, non-reducible element of science, for example, length.

6.9.2. Length occurs as the distance between two events, so depends on events without being an event. But without events there would be no length.

6.9.3. Time emerges in the exact same manner namely as the period between events, and so time is not an independent property of the universe but is related to the perceptual processes of the observer, with the observer independent properties being the events and the period between with the measure of period, the time between events, depending on the observer psychology plus any objective measure of the period.

6.10. Systems of Variables.

6.10.1. Variables not coherent are called systems of variables in that they consist of two or more coherent variables.

6.10.2. All systems of variables can be reduced in principle to the underlying components namely the underlying coherent variables.

6.11. Truth.

6.11.1. Truth arises in traditional epistemology since knowledge is defined as true justified belief.

6.11.2. Knowledge in this system is defined as the accumulation of ideas and the relationship between ideas and is not defined in terms of belief.

6.11.3. Truth is an act of individual judgment. Individually and collectively the veracity of judgment (verisimilitude) is taken to be proportional to the number of factors or elements we bring to account and the effort in pursuit of each factor or element. Or put another way it is the depth of our sufficient causal analysis.

6.12. Scientific theory.

- 6.12.1. The definition of a scientific theory follows as a set of variables and systems of variables and the relationship between them whereby the 'flow of change' through Reality is described.
- 6.12.2. A scientific theory can be used to predict Reality by inserting the values of some variables or systems of variables into the theory, and then the values of other variables can be calculated. For example, if we know the length of a pendulum by using the equation for the pendulum we can calculate the time of the period.
- 6.13. **Growth of knowledge.** Because knowledge is based on the classification of events it follows that the growth of knowledge is simply the noting and classifying of new events.
- 6.14. **Understanding.**
 - 6.14.1. New events noted and classified, alone may be mere anomalies because the universe is a whole, and our understanding is atomic (based on non-reducible fundamental variables) then understanding of new events does not occur until those events are related to other known events such that the new events take their place alongside all known events.
 - 6.14.2. When this occurs, there is an increase in our **understanding** of the universe. It follows that it is possible to have knowledge of the universe without understanding, and that we can also have understanding that predicts new events and so can lead to an increase in our knowledge of the universe.
- 6.15. **Thought and Reality.**
 - 6.15.1. The ontology of this theory of knowledge has as its core knowledge and Reality. We can only comprehend reality via our knowledge and understanding. Change is the fundamental of a dynamic universe, our knowledge and understanding describing the flow of change.
 - 6.15.2. Within Reality there are mechanisms generating this change, including the initial perturbation initiating some set of changes within some sub set of Reality. Our understanding and knowledge of the initiating perturbation and the mechanism whereby that perturbation travels through the sub set is our causal description of that change in that sub set.
 - 6.15.3. Technically, cause is defined as a relation between classes of relations between classes of events. Cause is a part of our knowledge and understanding, a representation of the mechanisms and perturbations of Reality, and must never be confused with those mechanisms and perturbations.
- 6.16. **Description without understanding.**
 - 6.16.1. Within this theory of knowledge we can have a constant conjunction with no knowledge of and hence no understanding of the mechanisms of those conjoined events.
 - 6.16.1.1. For example, ideas → behavior that is the relationship between thoughts and action can be postulated as a constant conjunction even though we do not know nor understand how this can occur. Such constant conjunctions merely highlight opportunities for research and theory creation.
- 6.17. **Reduction.**
 - 6.17.1. The process of reduction occurs if and only if the variables describing some system are divided into more fundamental variables retaining the quality of description of the initial variables. When this does not occur, then it is not a reduction, rather a shift to a new and different domain of science. For example,

discussing attention in psychology, the properties of attention as a variable being psychological, attention can then not be 'reduced' to neuro-physiology since the variables of the latter describe the physical operation of the brain and are not themselves directly psychological.

6.18. **Domains of science:** A domain of science is defined by coherent Variables not able to be reduced to any more fundamental variables without loss of the description offered by the variable.

6.18.1. In psychology, for example, Thought is a coherent variable, and cannot be reduced further; this has the effect of making psychology a unique domain of science.

6.18.2. The underlying mechanisms of Thought are neural events but if Thought is reduced to such descriptions then the actual value of the Variable Thought is lost.

6.18.2.1. This means that no two people necessarily have the exact same neurons implicated when they think the same thoughts, and second even the same person does not necessarily have the exact same neurons implicated in thinking the same thought a second time (every 'instance of' any thought is unique).

6.19. **Mechanisms and relations between domains of science:** One domain of science is reducible if and only if variables constituting the domain are systems of variables and are able to be reduced to coherent Variables from which the systems of variables are formed.

6.19.1. In any such reduction the quality of description is not lost, merely directed toward the lowest common level of the Variables from which the domain is constructed.

6.19.2. In all other cases, every domain of science relates to an underlying domain where by the conceptually lower level domain contains the mechanism of the higher domain.

6.19.3. For example, psychology is a unique and non-reducible domain of science, whereas neurophysiology is the mechanism whereby psychology is manifest.

6.19.4. Psychology cannot however, as a matter of principle, be reduced to neurophysiology since thought of a person is not able to be understood by examining their neurons (since the same neurons in one person may relate to a different thought in another person).

6.19.4.1. The defining of knowledge into domains of science leads immediately to separation of psychology from neurophysiology, with the latter being the mechanism of the former, which in turn specifies mind as ontologically part of the universe.

6.20. **Limits of knowledge and understanding.**

6.20.1. If we begin the reduction process at some point, what do we have when the variables can be reduced no further? We have previously created the image of a variable or system of variables as a box, abstracted from Reality, the properties of the variable defining the boundaries of the box. The contents of the box are then seen as the values able to be assumed by the variable, the 'instances of' the variable in fact observed or understood to be possible.

- 6.20.2. We only ever perceive 'instances of' an idea, we never perceive the idea, since it is created as an intellectual abstract with the definition being based on 'instances of'.
- 6.20.3. Any domain of science is able to be reduced to the Variables (the single property elements) the basis of that domain.
- 6.20.4. Where it is not known what the fundamental Variables of a domain might be, or where the domain is unable to be reduced to these elements (the Variable with single properties), when the domain is then reduced as far as it can be, what then do we have?
- 6.20.4.1. There can only be a system of variables and relationships between them, the internal operations of those systems being unknown and so there can be no way of knowing or identifying the mechanism whereby the events occur. The imagery is one of 'boxes' (the systems of variables) with known and possibly predictable input/output relations across them, but with no understanding of how those input/output relations occur.
- 6.20.5. The rule of relation applies at the limit of knowledge, that is at the limit of knowledge the object cannot be located in its environment since no relations conceptual lower than the conceptual object under consideration can be observed.
- 6.20.5.1. For example, a photon is at the limit of knowledge, but we cannot locate a photon in its environment since we cannot identify a photon independent of its environment. (Compare to a horse in a field, we can 'see' the horse and 'see' the field, and then place the two together, we cannot do this with objects at the limit of knowledge.)

7. The structure of understanding of the universe

- 7.1. **Conceptual levels:** arise as a consequence of the relation between classes of relation. So events perceived belong to different conceptual levels, and that this is not perceptual, this is intellectual; left solely to perception all events are at the same conceptual level.
- 7.2. **Natural perception.** Every species has a level of 'natural perception' that is a natural level whereby changes in a perceptual field are able to produce changes in the perceptual biological structures in the species.
- 7.2.1. To note changes in perceptual fields outside this range of natural perception requires the species develop machines for converting changes in a perceptual field that cannot produce changes in the perceptual modalities of the species, into changes that can.
- 7.2.2. Any species without such machines will have restricted causal insight and understanding of the universe, bounded by the level of natural perception of that species.
- 7.3. **The universal mechanistic postulate:** After Little the hypothesis is that *all constant conjunctions are ultimate effects.*
- 7.3.1. This means that immediate and ultimate effects (or immediate and ultimate constant conjunctions) are only so in relation one to another, with the conceptual level defining which is immediate and which ultimate. There is no absolute level of constant conjunctions, so there is no absolute level of immediate effects; there is no mechanistic base to the universe.
- 7.3.2. The summary and effect of the universal mechanistic postulate is that *there is always a mechanism.*
- 7.4. **Human knowledge is mathematical:** The consequences of always having a mechanism is that such interpretations of modern physics as reflecting the probabilistic nature of the universe is rejected, and quantum electro dynamics is seen as a powerful technology that does not grasp or reflect the underlying nature of the universe, and does not reflect the mechanisms underlying the events it so accurately predicts, it merely uses powerful mathematical tools to get the right answers; but that the mathematical nature of science is not a reflection of the universe, but a reflection of the very nature of our knowledge of it.
- 7.5. **Cause in summary:** two elements are needed to accurately say we know the cause, first we need know the mechanism whereby one thing becomes another (and in the instance under study we need to know there are not factors outside the mechanism able to alter the mechanism), and second we need to know the starting values of the variables able to influence the system under study. Knowing the start point, and knowing the mechanism and all factors able and likely to influence it, then the result is predictable.
- 7.5.1. **First cause:** If the values of the variables of the system under study are V1, we can ask 'what caused or resulted in these values?' The 'causes' of V1, are the values of the variables able to influence V1, plus the mechanisms leading to V1, let us call the precursors to V1, V1a. We can now ask what 'caused' V1a.... seeking first cause must lead to a regress which can only result in seeking the founding event that 'caused' of the universe (the 'big bang' for example).
- 7.5.2. **Cause is not necessarily proximal**
- 7.5.2.1. Can it occur at a distance? Cause revolves about events, defined by the observer; the fact that two objects that affect each other are not apparently

able to interact does not mean they do not so interact. It only means that we do not know nor do we perceive the mechanism whereby the two interact, but under the universal mechanistic postulate, we need look very, very hard, because there is always a mechanism.

7.5.2.2. If two events on opposite sides of the universe that occur as constant conjunctions, and our initial instincts suggests they are related, or evidence suggests so, then we have an interesting scientific problem of uncovering the mechanisms whereby the two interact, for the working assumption is that there is always a mechanism.

7.5.2.3. Do all mechanisms of the universe work only at close range? This is too big an assumption, it can and must be concluded that we simply do not know.

7.6. **Determinism.**

7.6.1. The model of knowledge on which the general theory of cause is based presents a deterministic view of the universe. This is counter to much of modern philosophy, but is a deductive consequence of the theory, not an assertion prior to the theory.

7.6.2. Freewill, human spirit and consciousness are not affected by this deterministic view, since these social and psychological elements are shaped first and foremost by the ideas we hold, and not by the neurological substrate of those ideas. Given good neural health, then our being is shaped by what we think not by the mechanisms of how we think.

8. Preliminary psychological structure

8.1. Ideas as orientating devices.

- 8.1.1. The grouping of events according to the properties of the event is the creation of conceptual knowledge of the environment with classes of events (categories of events) being defined as ideas.
- 8.1.2. Ideas are borrowed knowledge that is experience of one class of event is remembered as an idea and is used to predict and react when that type of event is encountered in the future.
 - 8.1.2.1. The term borrowed knowledge is from W Ross Ashby, Design for a Brain, and reflects the fact that categorising events based on ideas is assuming that this instance of this event type is the same as the experience of prior events and fits into the same category.
- 8.1.3. These circumstances are described by saying that ideas orientate a species to its environment.
- 8.1.4. The psychological consequences are well understood, in that there is the danger of not 'seeing' that this event is not the same having properties different from earlier events.
 - 8.1.4.1. We now immediately 'see' how what we 'see' of our environment arises and is derived from that environment, but at the same time the very conceptual structures we use to 'see' can result in us not seeing the uniqueness of events and not note changes in the properties of events.
 - 8.1.4.1.1. Most important this analysis is general, that is applies to all sentient species.

8.2. Levels of conceptualisation and survival behaviours enabled.

- 8.2.1. Level 1 conceptualisation is knowledge as an abstraction from Reality.
 - 8.2.1.1. First level conceptualisation creates ideas which are then associated in constant conjunctions offering causal expectation enabling adaptive reaction and survival.
- 8.2.2. Level 2 is applying conceptualisation to order our knowledge, a process leading to nouskills, or mind skills for ordering our understanding so that we act more effectively.
 - 8.2.2.1. Development of second level conceptualisation enables problem solving and management of the environment.
- 8.2.3. Level 3 is applying conceptualisation to itself.
 - 8.2.3.1. Development of third level conceptualisation enables full prediction of the environment and potential for control.
- 8.2.4. There can only be three levels of conceptualisation since with level 3 then conceptualisation is turned onto itself (so third level conceptualisation is a third level abstraction from reality as follows).
- 8.2.5. There are only two systems of tools for leading the conceptualisation process: Mathematics and Ashby/Little system of ultimate and immediate effects and definition of variables.
 - 8.2.5.1. Note: the universe may or may not be mathematical, but we do know the structure of our knowledge definitely is. Therefore we can use mathematics knowing it will lead us to develop different ways of seeing the reality abstracted from Reality.

8.3. Genetic or species borrowed knowledge.

- 8.3.1. Genetic or species borrowed knowledge arises when a species develops behavioural reactions to constant conjunctions. For example, rapid increase in temperature associated with fire and species that reacts to the temperature and moves away is thus more likely to survive.
- 8.3.2. These reactions can be understood in exactly the same way as ideas are understood, except the reaction is behavioural and encoded in the genetics of the species and so the species does not have a choice of the reaction as in the case of ideas. The genetically encoded reactions can be described as 'genetic knowledge' or 'species borrowed knowledge' although this term does take some liberties with the concept of knowledge.

8.4. Necessary structure of a general theory of a fully developed conscious species with third level conceptualisation capacity.

- 8.4.1. The species will exhibit all three levels of conceptualisation and associated behaviours.
- 8.4.2. Ideas must necessarily be a significant aspect of the psychology of the species and be the primary device whereby the species orientates to the environment.
- 8.4.3. The species must have an attention system including an alerting system whereby events with known potential threats are recognised and attended to and adaptive response considered.
- 8.4.4. Attending to the threat, and considering a response must involve some form of 'mental scratch pad' that enables estimation of adaptive responses so that in the words of Karl Popper "ideas die in our stead".

9. Applications and consequences of the philosophy

9.1. Tools for theory creation in social science

9.1.1. Ashby immediate and ultimate effects, system analysis, and the understanding of variables, and domains of science whereby descriptive explanation is related to underlying mechanisms.

9.2. Understanding the structure of science

9.2.1. Science is concerned with the construction of models that offer both causal and descriptive explanation.

9.2.1.1. Casual explanation is the identification of immediate effects that underlie ultimate effects.

9.2.1.2. Descriptive explanation consists only of ultimate effect relations. (At the limit of knowledge there can only be ultimate effect relations, and because these are fundamentally mathematical so then probability can be applied as a tool to circumvent our ignorance of the underlying mechanisms.)

9.3. Understanding the limits of science

9.3.1. Conceptualisation enables the deconstruction of the universe into manageable systems; all systems are driven by the mechanism intrinsic to the system. The operation of mechanisms produces events.

9.3.2. Science is perception of events followed by the management and creation of models that consist of variables and the immediate and ultimate effect relations between those variables. The models are then causal or descriptive explanations of systems.

9.3.2.1. Truth is not found in any process or procedure, but is the final judgement as to the preference of one model over others.

9.3.2.2. The aim of science is to enable causal explanation of all systems.

9.4. Understanding of the ethics of science

9.4.1. Science is an intellectual endeavour intrinsically bounded by the strategic demands of relating all topics with what can be and is known on the topic.

9.4.2. Strategic thinking is the conceptualisation of a topic in relation to the prior issues that relate to the topic and are pertinent in any consideration of the topic. It leads to the simple, practical and direct rule of *'first things first'*.

9.4.3. The extent a person (scientist) exhibits ethics of science are then the extent to which a person exhibits adherence to the rule of first things must be done first.

9.5. Understanding progress in science

9.5.1. Science results in 'models' of systems (Reality) offering causal and descriptive explanation.

9.5.2. Truth is the judgement as to models (scientific reality) that offer the best match to the system.

9.5.3. Progress in science is when scientific reality more closely matches Reality.

9.6. Interpretation of modern physics and of time

9.6.1. Physics is knowledge; therefore any interpretation of physics must be a detail within the overall relationship all knowledge makes with Reality.

9.6.2. Key aspects in the model of knowledge are:

9.6.2.1. That any theory can only relate to any example as the equation of the period of pendulum relates to any actual pendulum.

9.6.2.2. The rule of relations applies at the limit of knowledge, and while the rule of relations applies then we are restricted in principle from achieving any causal description, and the concepts at the limit of knowledge can only be understood as 'black boxes' with ultimate effect relations between them.

9.6.2.2.1. The 'black boxes' are best thought of not as 'knowledge' but as devices that define and encapsulate our ignorance: They are the limit of knowledge and beyond that point we are ignorant of the mechanisms (that is we are ignorant of the immediate effect relations that underlie the ultimate effect relations described by the black boxes).

9.6.2.2.2. While the rule of relations applies at the limit of knowledge then there can be no understanding of the mechanism whereby events are manifest. This does not imply there is no mechanism.

9.6.2.2.3. The general working assumption is that all causal expectations are ultimate effects, but where the rule of relations applies, as it does at the limit of knowledge, then we are restricted in principle from understanding any underlying immediate effects and so we have no way of ascertaining the mechanisms...so the hypothesis that probability is intrinsic to the universe is rejected on the basis we just do not know and until we can see and understand the immediate effect relations underlying the current ultimate effect relations we must hold the idea that probability is intrinsic to the universe as premature.

9.6.3. What we know of time is also knowledge, and any interpretation of time moderated by exactly as per the discussion above.

9.6.3.1. Within the philosophy time emerges as the period between events, with events defining the observer, so time is observer dependent.

9.7. The creation of a general theory of psychology

9.7.1. The theory is summed in the diagram 6 below (the labelling is from the original paper in which it was offered). The diagram is precisely a diagram of immediate effects as derived from the system Person ↔ Environment.

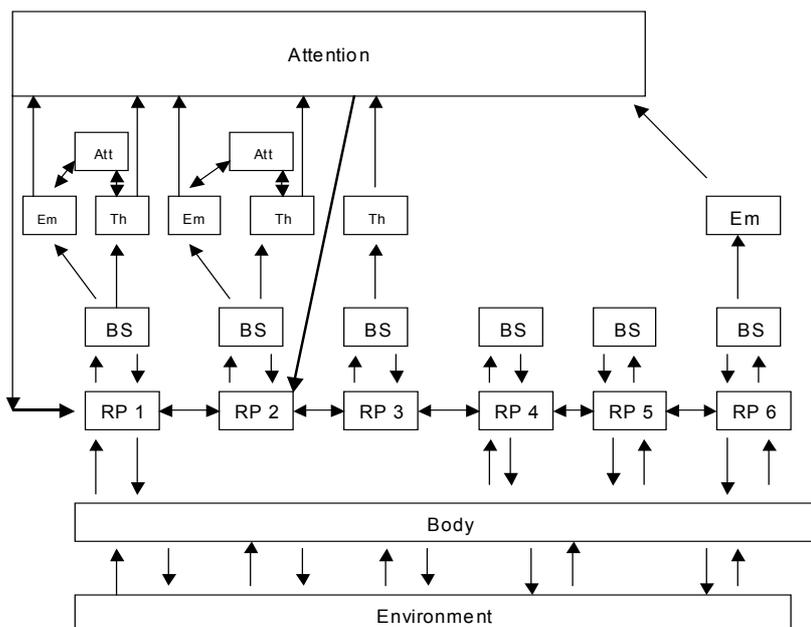


Diagram 6

9.7.2. The terms are defined as follows

- 9.7.2.1. **Body** defines all aspects of the body excluding the brain and central nervous system.
- 9.7.2.2. **RP, the reacting part** of Ashbyⁱ describes those neurons actually active and engaged with the events.
- 9.7.2.3. **BS, Brain Structures** defines the structures in the reacting part that determine and direct the neural energy that is the routes in the reacting part with lowest energy barriers. Energy flowing to fill lowest available energy states is the role of entropy in human affairs.
- 9.7.2.4. **Em and Th define the Thought and Emotion** engaged and involved with the specific events.
- 9.7.2.5. **Att defines an attitude** to the circumstances, strictly attitude in the model can be described by blend of thought and emotion, however, the idea of attitude as an orientation to events is a useful and succinct way of describing individual bias in thought and opinion.
- 9.7.2.6. **Attention, is attention**, able to be concentrated or spread, and able to intervene actively in some system and moderate it or to be merely a passive observer of the operation of the system.
- 9.7.2.7. Note the use of capitals, denoting coherent variables – that is those with a single extension – the others being systems of variables. Coherent variables define in principle domains of science not able to be reduced without losing the quality of description afforded by the domain. For example, Thought is a coherent variable and is in principle not able to be reduced to neural functioning because neurons in one person may entail one thought, while those same neurons in another person may entail a quite different thought, therefore examining the neurons and their functioning will offer no understanding of the psychology of the person.

9.7.3. Key points relating to the theory are as follows.

- 9.7.3.1. The diagram consists of sub systems that may contain some or all of the variables. These sub systems I call mental sets, which may be complete, as in RP1, or incomplete as in RP3, RP4, and RP6.
- 9.7.3.2. The diagram is a tool in the same way that $T=2\pi\sqrt{l/g}$ is a tool to apply to the pendulum to establish the unknown variable. To apply this tool (diagram 6) to a person requires the values of the variables be measured, every mental set identified, and every neuron linked to one or more mental sets. Having done that work, the resulting structure would be a 'snapshot' rather like the profit and loss or balance sheet of a business. Ongoing use to the detailed structure of the person would require caution since people change, and while overall themes would show coherence, the details may change substantially (I do not wish to overstress the change aspects of the model, since on balance people show greater continuity than change, which is to say the mental set structures tend to be stable with any surprise conduct exhibited by people most likely due to mental sets that already exist, but not publicly exhibited.)

ⁱ Ashby, W. Ross, Design for a brain, Chapman Hall, London 1960.

- 9.7.3.3. The operation of the diagram is via three loops, first the loop involving only the reacting part and brain structures, such as in RP4 and RP5, these structures would describe breathing, and such bodily functions as heart beat, with some of these not readily available to attention, but nonetheless existing and accounted for within the same overall structures.
- 9.7.3.4. The second loop is slower, and via attitude, Thought and Emotion, but is also driven by physical forces, cause and is no more than complex habit, with attention a passive observer.
- 9.7.3.5. The final loop is via attention, and is closed by the action of self to moderate and otherwise change the reacting part such that we feel and act differently than we would by cause alone. It is important to note that this loop is not always closed, and is not causal, it is the representation of our choice, to intervene and manage ourselves or not.
- 9.7.3.6. Mental sets form the fundamental structure of personality consisting of specific responses to specific events with broad generalities across events depending on the level of integration of attitudes, thought and feeling to similar events.
- 9.7.3.7. There are always many mental sets active at any time. The model readily accounts for the multiplicity of activity exhibited by people.
- 9.7.3.8. The overall system of Thought is described as the 'world view' of the person.
- 9.7.3.9. A person's worldview is their 'borrowed knowledge' (Ashby); it reflects their historical experience to the extent it is memory, both immediately available to consciousness and in the form of brain structures, some of which can be described and conceptualised. A person's novel is the living expression of their worldview and emotions, it is their life unfolding, with their prior experience merely bring them to this immediate point, with bounded choices as a result, and with their future malleable and shaped according to their choice and their efforts or failure to choose.
- 9.7.3.10. The person is not usually able to distinguish the affect of different mental sets, not unless they are widely disparate with clear and distinct cognitive content. Mental sets, for example, that consist of emotive responses such as RP6, developed say in early childhood prior to language skills are described as 'unconscious', and are the type of underlying emotive reaction to circumstances emphasised by Freud and other psychodynamic theorists.
- 9.7.3.11. It is important to note in the diagram that it is only attention that can intervene and alter the reacting part. This is most important, since it states that in the absence of active attention the system of the model will follow inherent causal pathways, it is only via active attention is humanity offered the opportunity to overcome the causal forces within the central nervous system.
- 9.7.3.12. The mechanism of this interaction is precisely as that for moving our left arm, we learn and can enact within ourselves internal states that achieve the movement we seek.

9.7.3.12.1. We are less schooled and less adept often at the management of our psyche than we need to beⁱⁱ. Nouskills is the name I coined to describe conceptualised sequences enabling better management of psychic states.

9.7.3.13. The model offers a view of human action and feeling that is complex and subtle. Diagrams such as those above most likely do not even begin to describe the complexity of active and independent structures in the brain that form the blending of our feeling and thought and habit and so lead into our actions.

9.7.4. Dismissal of Ryle's regress

9.7.4.1. Ryle's regress is summarised: To think requires us to act, but thinking is an action, therefore etc...

9.7.4.2. In the model as offered the regress is terminated by understanding the structure and levels of conceptualisation.

9.7.4.3. Level 1 conceptualisation is knowledge as an abstraction from Reality.

9.7.4.4. Level 2 is applying conceptualisation to order our knowledge, a process leading to nouskills, or mind skills for ordering our understanding so that we act more effectively.

9.7.4.5. Level 3 is applying conceptualisation to itself.

9.7.4.6. Summary:

Stage	Action
Internal action first level: which action?	Selection from options. Use of existing knowledge.
Internal action second level: How do I create (which action?)?	Creating options, creating and using nouskills.
Internal action third level: How do I create (how do I create (which action?)?)?	Act of conceptualization is conceptualized; currently there are only two conceptualization tools, that is intellectual tools that can lead the conceptualisation process: Mathematics, and W. Ross Ashby's ultimate and immediate effects (including the analysis of variables by GRLittle).

9.7.5. Dismissal of the homunculus

9.7.5.1. The second traditional infinite regress is of who watches the watcher, or the homunculus. This is an issue to very limited degree within the model as follows.

9.7.5.1.1. The model is parallel not hierarchical. Therefore the one part of the system is able to 'note and observer' events in another. This occurs via the attention system.

ⁱⁱ I have shown that ideas do shape mood and conduct; it follows that humans are subject to self-fulfilling tendencies. Much of our understanding of our psychology was and still is derived from quite inadequate models in religion and poor theories, such as Freud's. If we believe there is a soul and this directs how we act and feel, expresses 'us', then we are not especially likely to manage ourselves with any great intensity. Or, if we believe the mind and body are the same, then some people will act and talk consistent with that, whether or not it is objectively true. In short, our model of our self will feedback via and have a self-fulfilling quality on our mood and conduct.

- 9.7.5.1.2. The attention is a definite and limited physical resource able to do limited number of multiple tasks.
- 9.7.5.1.3. Consequently it is possible to watch one watching one doing something...Beyond a finite and limited number of stages the resource becomes to limited and the regress necessarily ceases when the resource is not able to be further divided.
- 9.7.5.2. There are now the psychological questions of why someone would want to do such a thing.

9.8. Psychology as a unique domain of science

- 9.8.1. The model contains coherent variables which cannot be reduced to any more fundamental variables without loss of the quality of description they embrace.
- 9.8.2. It follows that psychology is a unique domain of science, and psychological events as a matter of principle cannot be reduced to underlying neural events. Psychology and neurology are then separate domains of science where neurology is the mechanism of our psychology.
- 9.8.3. The model of then precisely draws and defines the boundary between psychology and the underlying mechanisms of our psychology in the brain (hence we can say the model is the solution to the body-mind problem).

9.9. Causality versus freewill

- 9.9.1. The model is causal in that mental sets are driven solely by there internal mechanisms.
 - 9.9.1.1. There are thoughts in a mental set, but those thoughts are a consequence of the functioning of the mental set and are not themselves causal.
 - 9.9.1.2. In all physical systems, crucial causal factor is entropy, or the tendency of all systems to seek the lowest distribution of energy available to the system.
 - 9.9.1.3. The neural system is similar, except when the neural activity driven for example by a perception of an event strikes a neuron which reacts to the energy input by triggering greater neural response, such a response is an 'attention generating' device within the neural structures.
 - 9.9.1.4. All mental sets will follow their own mechanistic pathways unless the attention system intervenes.
- 9.9.2. Summary: The neural system is causal unless there is direct intervention by the attention mechanism.
- 9.9.3. Attention is one part of the parallel systems noting the events in other parts, and able to intervene in those events.
 - 9.9.3.1. Attention notes events in another parts of the system, is able to classify them, and to recall insight and understanding of them, then choose courses of action from the options available.
 - 9.9.3.2. There is nothing else implicated and the model of diagram 6 is complete.
 - 9.9.3.3. The whole model is the model of consciousness, but the core of consciousness is the attention system. Without attention there is no consciousness.
 - 9.9.3.4. Only attention can intervene and alter the flow of causality (via the underlying mechanisms) through any mental set.
 - 9.9.3.4.1. When the neural system energy flows through our mental sets is called habit.
 - 9.9.3.5. Only attention carries current intent, with all mental sets carrying historical intent and/or borrowed (historical) knowledge as defined by Ashby.

- 9.9.3.6. Only current intent is free of causality, and only current intent via the attention system can intervene and stop causality carrying us along with it.
- 9.9.3.7. Comfort zones are circumstances where we know and are comfortable with historical intent, and so we can allow causality and not need to intervene in operation of our mental sets, or with minimal intervention. In comfort zones we can fully allow habit.
- 9.9.3.8. Being forced out of our comfort zone is to be placed in circumstances where our historical intent is insufficient, and so we are required to assert our current intent via attention to redirect our habits.
- 9.9.3.9. The unique condition of all consciousness is to assert free will in the form of current intent over habit.
- 9.9.3.10. If circumstances are unchanging then likely habit will suffice, and that does not demand free will, only pre-programmed reactions.
- 9.9.3.11. Free will is again a crucial survival option for a species, since it allows the species to adapt as matter of deliberation to new circumstances without needing to wait to an impregnation and birth process (which, depending on the time scales, could result in the death of the species).

9.10. Free will and determinism

- 9.10.1. The discussion above describes the operation of free will via attention and selection of options. In short, free will is the exercise of choice via the attention system to select and adopt responses beyond that dictated by the intrinsic neural flow that is described as causality.
- 9.10.2. The fundamental condition of all sentient life is the tension between free will and entropy as representing causality and the physical operation of the universe.

9.11. Definitions of mental health, mental illness, psychological dysfunction and insanity

- 9.11.1. Psychology is a unique domain of science with the underlying mechanism in the neural and nervous systems.
 - 9.11.1.1. It immediately follows that there can be dysfunction within our psychological and conscious functioning but that does not imply the underlying mechanisms are dysfunctional; in short, psychological impairment is possible in fully functioning and healthy neural and nervous systems.
- 9.11.2. Psychological dysfunction is defined as dysfunction of the mechanisms of our psychology as described in diagram 6 and associated discussion.
- 9.11.3. Insanity is defined as the implementation of values of the variables of diagram 6 such that all actions and thoughts fall outside the range of the social norms.
 - 9.11.3.1. In the instance where the values do enforce actions outside social norms, the person will not understand what they did wrong and they will have neither remorse nor conscience.
- 9.11.4. Mental illness is defined as failing of the neural and nervous mechanisms underlying our psychology. Therefore mental illness is beyond control of the person in the exact same manner that all disease tends to be beyond control of the person.
 - 9.11.4.1. Mental illness is therefore not psychological and not 'mental', although manifestation of any neural disorder will via experience of mood and exhibition of conduct which if classified accurately could be used as symptoms of the underlying disorder. The difficulty is that at the moment the

technology to identify the relationship between neural disorder and behavioural symptom is too unreliable in too many cases to be a definitive guide.

- 9.11.5. Currently mental health is defined as absence of mental illness (and/or psychological dysfunction within this model). The model leads to a clear and definitive position on mental health as the uninhibited operation of the main process implicated in the system as described by diagram 6.

9.12. A prescriptive definition of mental health

- 9.12.1. I have developed much of the argument elsewhere, and will not repeat it hereⁱ. The arguments lead to a view of mental health that encompasses the dynamic aspects of the theory in operation as follows.

9.12.1.1. **Integration, a consistency within the person's worldview:** There is an integrated quality to their thoughts and attitudes giving rise to a consistency of attitude and approach across various situations.

9.12.1.1.1. The person has no extreme Thought, with the overall pattern of their worldview exhibiting an integrated quality with a balanced relationship between attitudes and reactions in one mental set as compared to another.

9.12.1.1.2. Nouskills will enable the identification of extremes and the developing of self-statements, self-arguments and attitudes that moderate the extremes and provide the balance.

9.12.1.2. **Poise, a consistency of emotion within the psychic structure:** Within the emotional structures of a person there are no great swings of mood, emotion or attitude not related to events of significance to them.

9.12.1.2.1. Supported by nouskills that enable self-management of emotional states and when under stress and pressure of circumstance (so resulting in diminished likelihood of regret or guilt over one's conduct).

9.12.1.3. **Transitions, shifting between roles and mental sets within role systems:** There is an ease of transition from structure to the next.

9.12.1.3.1. They have the skills to shift from one role to another, to allow transitions between mental sets that do not exhibit marked breaks of conduct.

- 9.12.2. **Points arising from this position.** The theory (diagram 6) itself does not differentiate between 'no poise' and the 'best possible poise', the reason being that 'poise' or 'no poise' describes a specific individual in some specific circumstance, and the theory can only describe the variables into which values are fitted. For a person exhibiting 'no poise', then the values for emotional variables, and for their reactions would then show behavior quite different from a 'poised person' in same circumstance or different for same person who was poised in different circumstances.

- 9.12.3. To emphasize the factors (integration, poise, and transitions) as key aspects of 'mental health' is making choices of some sets of values as being of more desirable than others. It is doing this in that if we were to choose 'poise' we are saying that those values of Thought and Emotion that would be described as 'poised' are given greater human regard than values of Thought and Emotion that would be described as 'not poised'.

- 9.12.4. Our laws in fact tend to reflect this issue, for instance a person is only afforded the right to react so far before the law will punish them, and a mitigating

- factor is circumstances beyond that where a reasonable person would be expected to cope.
- 9.12.5. The law places bounds on the type and extent of reactions acceptable, and does so in all societies. From the point of view of the society, mental health can then be described as integration poise and smooth transitions within the bounds as determined by the legal strictures, this represents the most extreme definition since it leaves much scope for, for example, un-poised conduct.
- 9.12.6. The arguments can be extended to build an 'ideal', that is the image of a person to which the society might aspire. An ideal might be an image of a person who allows their anger but not to the point of leaving them ashamed or regretful, that allows their pleasure and losing themselves in some such moments, who may pursue their own beliefs and politics protesting as needed and breaking laws to drive home their points but doing so in full understanding and expectation of consequences. The imagery of the 'ideal' is not one of compliance, but one of reasoned understanding of themselves, their life and place in time, and making and living choices for themselves within their time.
- 9.12.7. The ideal as described does not define specific values but as stressed, does afford higher regard to some sets of variables over others, and the variables given greater regard do represent moral and ethical choices, with the greatest extremes of those choices being the legal system and its definitions of allowed and not allowed, followed closely by the social strictures guiding and pressuring people on what is right and what is wrong.
- 9.12.8. These issues have important and poorly understood policy issues on the point and purpose of government, especially in a democracy. A key social policy issue for governments within the model is the balancing of laws such that behavior is constrained appropriately, while at the same time the government widening the legal strictures and encouraging the development of the necessary understanding and discipline within the population. I know of no government now or in the past that has conceptualized this issue, the conflict between law and human development, and developed effective policy and actions in regard to it.
- 9.12.9. The approach does not prescribe morals or norms, so a hired killer or a drug Czar may be 'mentally healthy', despite enacting behaviours repugnant to most people.
- 9.12.10. The model of mental health embraces key dynamic components most immediately represented by the brain structures the psychic flows in relation to events with these flows determining the values adopted by the variables. Nouskills are the conceptualization of brain structures and once adopted and enacted and built into habit become themselves the functioning brain structures.
- 9.12.11. It is this argument that mental health focuses on the dynamics of our psychology that leads to promotion and development of nouskills in the population as a primary aspect of mental health policy.
- 9.12.12. It can be argued that this model of mental health is descriptive and normative in that if a person holds to the idea that 'what I do is what I do and I will never look back or regret, for it is me' and however they react and respond is legitimate and refutes the views above on mental health in that this person see themselves as mentally healthy and ignores the process dynamic issues that underlie the definition of mental health.
- 9.12.12.1. first question whether their experience of life and of consciousness and of themselves would be enhanced by adopting a manner of being in the world

less centred on their own psyche and more tuned to what is about them. There are also related questions on disciplines needed to work etc, and whether these mapped neatly onto 'I choose to do exactly what I want when I feel like it'. There are further social issues and issue of composition, it may be okay for one person, but if the whole society or community acted in such a manner...?

9.12.12.2. Finally, we acquire much of our internal neural structure early in life, and at essence we are learning and adaptive species, merely allowing what ever is in our neural structures right of expression assumes this is always right and will always be the best response, which seems unlikely.

9.13. *Mental health and spiritual well-being*

9.13.1. It is important to understand that by 'spiritual' I mean no form of religion or of religious spiritualismⁱⁱⁱ. To be spiritual means a certain way of being in the world, and that way being represented by the image of the ideal as outlined above. A person can be spiritual, full of life and complete without choosing any form of religion or God.

9.13.2. Life choices (values, ethics, and morals) are crucial aspects of 'spiritual humanism', and draw the line between spiritual humanism and mental health. For example, the drug Czar killer may be mentally healthy, so to that extent they exhibit spiritual humanism, and one would judge them with no knowledge of what they did. However, knowing them to be hired killers for a drug Czar would have them dismissed due those life choices, regardless of how mentally healthy they may be.

9.13.3. Mental health is an important aspect of spiritual well being which is a broader idea embracing moral and ethical choices, but mental health as herein defined is a crucial aspect of spiritual humanism such to say that social policy developing mental health is equally facilitating the spiritual development of the population.

9.13.4. A question to be considered is the extent that enhancing the mental health/spiritual development of the population will lead to greater life enjoyment and fulfilment. Furthermore, whether or not development of mental/spiritual health and well being would influence such factors as crime, domestic violence, and racism. These questions are only relevant within the definitions and framework of the theory as outlined here.

9.14. *Construction of mental health policy*

9.14.1. The model offers the only definitive and proactive approach to mental health summarised as follows.

9.14.1.1. **Integration, a consistency within the person's worldview:** There is an integrated quality to their thoughts and attitudes giving rise to a consistency of attitude and approach across various situations.

ⁱⁱⁱ My position follows the writings of Lloyd Geering asserting God to be a man made concept. See Lloyd Geering, *Christianity without God*, Bridget Williams Books, Wellington and California, 2002. I go somewhat further, proposing a completely humanist spirituality, not requiring God or any form of religion, but nonetheless a profound and full faith and belief system, focused on living a full and vigorous life in one's own time and place: for an initial introduction to the ideas, see Little, G.R., *Nouskills: skills of the mind*, at www.grphilosophy.co.nz.

- 9.14.1.2. **Poise, a consistency of emotion within the psychic structure:** Within the emotional structures of a person there are no great swings of mood, emotion or attitude not related to events of significance to them.
- 9.14.1.3. **Transitions, shifting between roles and mental sets within role systems:** There is an ease of transition from structure to the next.
- 9.14.2. Mental health policy then follows.
- 9.14.2.1. Development of greater understanding of the only causal model of human conduct via school curricular, public education, and promotion of the model and its implications by all government media and departments.
- 9.14.2.2. Development and dissemination of nouskills that enable better management of our intellectual resources and better management of our emotions (emotional intelligence).
- 9.14.2.3. Better understand of roles, role transitions and how to better manage both.
- 9.15. Causal explanation of depression and violence**
- 9.15.1. The model when applied to the questions of causes of depression and of violence offers a complete and thorough solution. Details of the application is best found in the papers <http://www.grlphilosophy.co.nz/Thecausesofviolence.htm> and <http://www.grlphilosophy.co.nz/The%20Causes%20of%20Depression.pdf> .
- 9.16. Mapping of the model onto existing theories of psychology**
- 9.16.1. The model has been mapped onto existing approaches to psychological theory and therapy and is fully able to account for such theory. See the paper <http://www.grlphilosophy.co.nz/comparative.htm>.
- 9.17. A soul is not needed to achieve full causal explanation of human mood and conduct**
- 9.17.1. The starting point for creation of the model was to approach person ↔ environment as a 'system', then to conceptualise the variables and their relations^{iv} such that the conceptual model tracked the flow of a perturbation through the system.
- 9.17.2. No prior assumptions are allowed, and the analysis proceeds in the direction determined by the tools.
- 9.17.3. The model is a causal description of the system studied, person ↔ environment, and achieves this status using the variables and relations between those variables dictated by the tools.
- 9.17.4. No additional factor is needed to achieve full causal description of any aspect of human mood and conduct.
- 9.17.5. The clear implication is that no soul is required to causally understand human mood and conduct; this does not mean it does not exist only that it is not needed in any full causal model of human psychology.
- 9.18. Creation of a causal model of strategic human resource management (SHRM)**
- 9.18.1. Management is fully part of social science, and cannot be commented upon without being grounded in social science management science constrained by the exact rules and strategic processes as applies to all science.
- 9.18.2. Application of the tools to the question 'what is the link between staff behaviour and business strategy and goals' leads to the following solution.

^{iv} The conceptual tools used are Ashby primary operations, immediate and ultimate effects, and the analysis of variables by Little.

- 9.18.2.1. A business is separate from people. An apparently simple idea that many find difficult to grasp, people come and go, but businesses go on often doing exactly the same thing.
- 9.18.2.2. Every role (job) in a business is driven by the expected outputs, and often those outputs are not very negotiable.
- 9.18.2.3. For every goal there are actions necessary to ensure the goal is achieved. The actions needed to ensure the best chance of achieving the goal are called ideals. It follows that there are ideals in every business role derived from the goals and KPIs demanded in the role.
- 9.18.2.4. The architecture of the business then consists of:
 - 9.18.2.4.1. Defining in every role the goals/KPIs as derived from the strategy (goal cascade or alignment),
 - 9.18.2.4.2. Defining the ideals as derived from the goals.
- 9.18.3. The cultural processes then need managed to guide staff to enact the ideals to the standard required to achieve the goals and KPIs as agreed in each role.
 - 9.18.3.1. **Intellectual engagement:** The processes are designed to link the ideals as drafted on paper by the leadership to the minds of the staff so that that they 'see' the ideals, and 'see' themselves acting out the ideals as the norm for their conduct at work.
 - 9.18.3.2. **Emotional engagement:** People are asked to commit to their own success at work and understand and agree that that success is them acting out the ideals as fully as they are able.

10. Final comment

- 10.1. Knowledge is central to all human endeavours; hence the development of a general theory of knowledge that is apt and accurate must permeate and influence every aspect of human endeavour.
- 10.2. Conceptual models are a dominant force in human affairs, we all 'see' via the models in mind, with perceptual processes merely the means we acquire the data we use to construct the mental models of our environment and beyond to 'see' the universe at least in our minds eye.
- 10.3. Scientific theories are merely more precise versions of what we all use everyday. There for developing better models that assist us 'see' better and more clearly must help us better understand and so act more effectively.
- 10.4. As the understanding of the model deepens so other and more detailed implications will emerge to further reinforce the view that there is nothing more useful than a good theory.

ⁱ See Little, Graham R., A strategy for mental health policy and the *Process Theory of Psychology* at www.grphilosophy.co.nz.