

## *Can Experience be Grounded?*

What I will argue, is that the experience of the senses cannot be ground by an empiricist or realist philosophy of science. The former I take it is supposed to give us an ever more accurate picture of the world with its laws, while for the later it is the categorical facts of the world that restrict what true for chance. Since only what is observable is true it becomes impossible to prove universals. According to Wolenski, J. in response to feedback from a talk I gave at the first conference on Aristotle's Square of opposition, the probable implies the possible and the improbable implies the impossible. What then of what is necessary, does it not entail the impossible if it is false?

To further inquire into the nature of ground, I will focus on some of Bas. C. van Fraassen's writings. This is mainly because I think he best reflects the folk psychology behind the concept of grounding. It will seem as if he is also guilty of using analogical references to observable structures to model unobservable ones. Here I am not only thinking of Newton's atomism, but also Russell's hierarchy of functions. Experience I think would be better modelled by thinking of real processes as procedures which can raise or lower the probability of an event, so their utility is constituted by their likelihood and predicated by their relation within a higher standpoint of system. Such an idea will take its inspiration from some of Hegel's salient points, as well as Brouwer, Heyting and Shoemaker.

Hume I take it sees the reasoning for our understanding of experience to be ground on our conventions. Any scientific justification in terms of the best system analysis, begs the question of how to decide what such an analysis is. For if what is false within the proposition can be extracted from it without contradicting what is true for it this can also be a convention. So when the ground becomes dependent upon its belief can the later have an identity independent of its difference or likeness to other beliefs? For one of his latest and strongest advocates, Lewis, D.K., makes it dependent on the categorical structure of the world. Since he claims this restricts what is true for chance, this is his *big bad bug*. This seems to me to make the truth of what is experienced to be contingent and so begs the question of it having a ground. With no reason for the system being the way it is and not otherwise how can it have any modality; necessary, possibility or impossibility if it ground is a purely subjective state of affairs. In other words you can have lonely worlds, no worlds and every possible world. This I take it means its history is one grounded on the denial that a degree of belief in a proposition has any value other than a contingent or rather an imaginary one. If the speculative value of scientific theories is denied by its methodology of hypothetical deduction, i.e., as with error statistics (See the handbook for the Philosophy of Statistics), falsification (See Popper) and refutation what right have they to make a claim to expert knowledge? Being in a conflict with the experimental results this argument would seem to strengthen the case for the realist's formulae being the ground. They think the world can be explained by our physical laws alone and this is what a justified true belief amounts to. However, as van Fraassen points out in *The Scientific Image*, this leaves the problem of their literal truth.

In *The Scientific Image* van Fraassen mainly argues for theories being *empirically adequate*. This can be seen in opposition to a belief where a scientific theory can be **valid independently of any opinion that it is otherwise**. This understanding contradicts his belief that the ground of our inferences regarding their reasoning is subjective (See van Fraassen. 1995. *Fine-Grained Opinion, Probability,*

and the Logic of Full Belief. *Journal of Philosophical Logic* 24: 349:377). With this notion the only certainty is a historical record of the theories successes and failures. An ad hominem appeal to “ $P(A|A)=1$ ” and the ratio analysis of Kolmogorov is made, but probabilities are measures of future expectations. What is past is no longer probable and so has no ground. Despite confounding the state of a functions property with the method of making predictions van Fraassen tries to show his so called *constructive empiricism* should take credit for the history of scientific progress:

#### 4. The problem of empirical grounding in the 19<sup>th</sup> century

Now we have come to the besetting problem of the atomic theory that Dalton introduced early in the 19<sup>th</sup> century, and that was extended into the kinetic theory of heat, finally into the statistical mechanics which rivaled phenomenological thermodynamics. I’ll use the term ‘kinetic theory’ to refer to all of that, for short. This methodological demand for empirical grounding, that we see so clearly operative throughout the modern history of science, applies to the kinetic theory as well. The attitude toward the atomic and molecular structure postulated in the 19<sup>th</sup> century was precisely that the models provided by the atomic theory must be thoroughly coordinated with measurement procedures. Let’s make the demand explicit in general terms:

**(I) *If two such models of a given phenomenon differ only in the values of certain parameters, there must be in-principle measurement results that will differentiate between them.***

**(II) *Similarly, for any distinct states in the theory’s state-space, in which the model locates the systems’ trajectories, there must be in-principle measurable quantities that differentiate them.***

The term “in-principle” refers here not just to the idealization that measurements have unlimited precision, but also to Weyl’s observation that the differentiation is not crudely theory-neutral, but on the contrary, relative to the theory (and perhaps additions from background theory) itself. If these demands are satisfied, let us call those parameters, or the theory, *empirically well-grounded*.

In a kinetic model of a gas, there are many parameters that pertain to the individual molecules. The empirical success of such models is related to the measurement of ‘gross’ quantities such as mean kinetic energy. If two such models of a gas agreed on those quantities that were meaningfully measurable also in phenomenological thermodynamics, but differed in the values of such parameters as individual masses, sizes, momenta, or number of molecules, could there be measurements to differentiate those, in principle?

Philosophers’ history of the scientific research directed to this question has largely seen it displaying philosophical rather than scientific motivations. But if we look at the texts with new eyes we see that the objections and challenges concerned precisely the question of whether the parameters in the atomic theory could be

empirically well-grounded. (2009. The Perils of Perrin, in the Hands of Philosophers. *Philosophical Studies* 143, p12-13, See: <http://www.princeton.edu/~fraassen/abstract/index.html>

If grounding the model's theories work within a higher standpoint of system so as to contain the lower standpoint of system, it will have a greater speculative value. By putting measures first, empirical adequacy makes the methods relation to its function and to that of other methods mysterious. That is, empirical adequacy can be seen to undermine the determinacy of their speculative relation. If the laws of its physics are merely postulated or presupposed, hypothetical grounding seems to paradoxically be ungrounded. If not then the progress of science within the dialectic actually counts for something. I.e., atoms as unobservable might not need to rely on an analogy with particles to Brownian motion. If particular justification of the atomic theory amounts to a general argument, it will either sink or swim according to whether its properties states can cover the theory of their interaction. Within the context of its functions conditions e.g. under certain atmospheric and gravitational conditions, generalizing presupposes the theory is correct without proof of it. That is, if the inference follows from the illicit move of the particular to the general how can it claim to be empirically adequate?

Here there is an object, but the ground is more than just an object; the truth of the atomic theory is supposed to hold immediately, whereas that which is grounded has been mediated. As such the atomic theory a priori is supposed to be valid independently of any belief that it is otherwise. This objectivity contradicts it being empirically adequate. Being dependent on sensory experience makes its empirical justification posterior, not a priori! Empirical adequacy cannot therefore be the reason for its objectivity; given this must remain mysterious. A priori its reasoning suggests its case is weakened, but its choice as an explanation is stronger than some other theories. This is how I presume the realist would argue, but as we will see their reasoning also lacks universality.

Coming before any reason for its objectivity also means it cannot be a principle of the dialectic; the method of postulation or hypothesis and as such cannot provide one. Following Plato, what comes after the principle assumed to be a principle (The Republic) are the mere shadows or reflections of its ground. Anything can be deduced, as no reason for how the parameters of the kinetic motion given the properties of the experiment interact with others that are external to it. Being incomplete the empiricist understanding of a principle cannot be a ground with an object argument. What the empiricist is stuck with as Hegel notes is mere *picture thinking*. Clearly the agents subject to the principle of the ground can only know or interact with it but never break what is true for it. What is important is that they are free to believe in that which is not a ground. This explains why different theories can provide better or worse models of a process. Here I presume the model has an interpretation; the most important, and arguably the most controversial is the dialectic. Given it is the *function of reason* its principle must belong to the ultimate ground.

Its history does not commit us to any dogma, as the way the theories of its concepts are understood within a disposition means paradigm shifts are possible. Being a ground is not a choice, but what is assumed to be well-grounded is or experienced is.

Without the ground, thought could not be true, false, undetermined or indeterminate. Having an intermediate value to some degree means it can be speculative. Certainty means that the understanding can have a credible degree of belief in the parameters be measured using different methods. Being in a determinate relation their experience has a ground, so the quick and easy answer is, that experience is grounded.

Who can explain the elements, if not by their properties given the folk psychology of our disposition? Perhaps an even more pressing question, should we accept causal powers without a ground? The power of properties potential is captured by what Shoemaker calls their *conditional powers*. I take it that this is intrinsic to the quality of forms e.g. explosive devices. If not determined by the way their function is grounded, how can they be experienced? The laws which hold for the way they can be composed, mean their identity can have an explanation within a higher standpoint of system. Explanation without scientific criteria fails to provide models of the forms that do have a chance of being experienced. In other words those theories that are better grounded will make better predictions than those that are merely representations of its idea. Given the ground has a credible value in terms of an agent's degree of belief in its proposition, the proportion of its properties states means its manifold has a composition. Taking the manifold to be a set of oppositions and not a set of possibilities which has no limits, it can be real. By this I mean explain the parallel processing of information within an actual world. This composition means the scientist, like the artist is aware that their choices might raise or lower the chance of producing or feeling a desired effect.

If we can only be certain of events that have already occurred, what of that which has not yet occurred? They might not have a ground, but can they be grounded? Like Shoemaker (Shoemaker, Sydney. 1980. 'Causality and Properties'. In Identity, Cause, and Mind. 2003. Oxford, p206-233), I think the case for *conditional powers* is overwhelming, but instead of psychological states being functionally defined I would claim that they are interactive. If our mind has a program, the idea of its history has a ground so its experience is not a mere copy to use Hume's turn of phrase given its understanding of the parameters measured can evolve. Independence as such only means that the states of the properties being measured correlate with each other to some degree, whereas for dependence they cannot, given they are mutually exclusive; if one occurs, the others cannot. Consider the more abstract idea of being well-grounded where the content of the terms is denied a relevant semantics:

*Ground is the relation of one truth holding in virtue of others. This relation is like that of consequence in that a necessary connection must hold between the relata if the relation is to obtain but it differs from consequence in so far as it*

*required that there should also be an explanatory connection between the relata. The grounds must account for what is grounded. Thus even though P is a consequence of P & P, P & P is not a ground for P, since it does not account for the truth of P. (Fine, Kit, 2011. The Review of Symbolic Logic. p1-25). See: <http://philosophy.fas.nyu.edu/docs/IO/1160/purelogicground.pdf>*

Ground for Fine, as for many other formalists is a conceptual claim which can be postulated e.g., like the relation of propositions being transitive; if p is a ground for q and q is a ground for r, p should be a ground for r. How can a proposition make a proposition? Or if the well formed formulae are ground by propositional variables and connective constants, what grounds the validity of their use? Taking propositions as relics of a language they must refer to that which is in a relation with what they mean; what is true for the concept. The structure of properties being dynamic means old forms can be transformed into new Forms, but what of the properties themselves? What is the evidence that they change? Certainly if the cause of the forms raises the chance of some effect, why should the truth of the matter be reduced to the structure of the world's categories as if no new forms can emerge? Given they are the mere copy of ideas and all truth about their chance supervenes them it would appear they cannot. Modality is reduced to brute contingency, but contingency cannot be a logical ground as if all that matters is that the value of the theory depends upon its holding for observation; what of one understanding of a theory in relation to some other understanding of it? So while we can have an empirically well-grounded theory of measures that better accounts for the parameters of gas molecules, can it belong to a more effective method of predicting those futures which hold for it and or undermine it?:

Given the convergence of computably calibrated forecast systems-if any exist-can there be a 'universal' forecast system which will be correct in the long run-if any system is? The answer is No. No matter how well we design our procedure for self-correction in response to the evidence, Nature may confute it<sup>6</sup>. The proof uses the form of diagonal argument now familiar to us from all areas where computability plays a role<sup>7</sup>. (van Fraassen. The False Hopes of Traditional Epistemology, *Philosophy and Phenomenological Research*. Vol. LX, no. 2, March 2000, p260, See: <http://www.princeton.edu/~fraassen/abstract/index.html>

Given this argument can be falsified, let me call it the myth of empiricism, or one version of it. What it fails to consider by analysis, is comparing the restricted use of the binomial formula, or any other method of calculating probabilities and likelihoods to the unrestricted use of it in terms of oppositions for updating probabilities. As such it should not be taken as anything other than ad hominem given van Fraassen doesn't even get the difference between unities of opposition in a quantified relation from ones within it. With this a much stronger proof then can be given than a diagonal method presupposing a one-sided ordering of a possible state set.

Knowledge of ground; its laws is not possible without the functions of properties being a catalyst making them determinate for their relation. If I follow it correctly, van Fraassen's model of the EPR experiment also makes the error of applying possibilities to the properties of the quantum and so fails to get 'spooking action at a distance'. Presumably (I welcome the reader to offer ways in which this can be made more coherent) the result of abducting P1+P2 confounds Bosons with Fermions?, given the later abide by Pauli's exclusion principle; quantum relativity understood in a general way cannot give us a ground for both:

## 6. Relational EPR

Laudisa 2001 and Smerlak and Rovelli 2006 have examined how the EinsteinPodolski-Rosen situation can be regarded or modeled within Relational Quantum

Mechanics. They do not entirely agree in their approach. Here I shall show how the situation fares if my Additional Postulate is accepted. The result appears to be different from what is favored by Rovelli, though it does not seem to affect the empirical content of the resulting formulation of quantum mechanics.

Let S be a two-part system  $\alpha+\beta$  (such as a photon pair in singlet state), in a superposition of correlated states  $\uparrow \otimes \downarrow$  and  $\downarrow \otimes \uparrow$ . The arrows are eigenvalues of observable A.

Observers P1 and P2 respectively measure  $A \otimes I$  and  $I \otimes A$  with pointer observable B. ROV has information on initial states and dynamic process

P1 gets  $\uparrow$  or  $\downarrow$  ... the state of  $\alpha$  relative to P1 is  $|\uparrow\rangle$  or  $|\downarrow\rangle$

P2 gets  $\uparrow$  or  $\downarrow$  ..... the state of  $\alpha$  relative to P1 is  $|\uparrow\rangle$  or  $|\downarrow\rangle$

P1 +P2 gets  $\uparrow\uparrow$  or  $\uparrow\downarrow$  or  $\downarrow\downarrow$  or  $\downarrow\uparrow$  .....th e state of  $\alpha+\beta$  relative to

P1 +P2 is  $|\downarrow\rangle \otimes |\uparrow\rangle$  or  $(|\uparrow\rangle \otimes |\uparrow\rangle$  or  $(|\downarrow\rangle \otimes |\downarrow\rangle$  or  $(|\uparrow\rangle \otimes |\downarrow\rangle$

For P1+ $\alpha$  +P2+ $\beta$  ROV assigns at the measurement time a superposition of

$(|B, 1\rangle \otimes |\uparrow\rangle) \otimes |B,2\rangle \otimes |\downarrow\rangle$

And  $(|B,2\rangle \otimes |\downarrow\rangle) \otimes (|B,1\rangle \otimes |\uparrow\rangle)$

This implies that ROV assigns to  $\alpha + \beta$  a mixture of  $(|\uparrow\rangle \otimes |\downarrow\rangle)$  and

$(|\downarrow\rangle \otimes |\uparrow\rangle)$ .

By the Additional Postulate it follows that the state of  $\alpha+\beta$  relative to P1 + P2 must

be one of these, thus ruling out two of the possibilities noted above. And then P1+ P2

will assign to  $\alpha$  and  $\beta$  separately either  $|\uparrow\rangle$  and  $|\downarrow\rangle$  respectively or  $|\downarrow\rangle$  and  $|\uparrow\rangle$  respectively. But then, again by the Postulate, the states of  $\alpha$  and  $\beta$  relative to P1 and to P2 respectively cannot be the same, on pain of orthogonality to what they are relative to P1+P2. (van Fraassen, 2009. Rovelli's World. Forthcoming, *Foundations of Physics*. [http://www.princeton.edu/~fraassen/abstract/Rovelli\\_sWorld-FIN.pdf](http://www.princeton.edu/~fraassen/abstract/Rovelli_sWorld-FIN.pdf))

What can be introduced instead of possible sets are sets of oppositions, but I leave the reader to spend some time on that problem. The solution if they so desire it will be forthcoming, but given the way they might have been programmed to think; empirically and or formally, they might fail to comprehend it in an intuitive and speculative way. If they do, I put it to them they will be free from the constraints of abstract set theory. And higher up the ladder will not confound the later concepts with the idea of metaphysical necessity; where the objectivity of chance supervenes facts that ground the categorical structure of the world.

Beyond the Realism of Newton and the Empiricism of van Fraassen it appears you can avoid the Laplace's demon; a determinism where humans must remain forever ignorant of the consequences of their reasoning. The main argument for realism derived from Newtonian mechanics is rule 4 (See Westphal, K. 2011, Kant's Cognitive Semantics, Newton's Rule Four of Philosophy and Scientific Realism. Bulletin of the HSGB. Nos 63/64, p27-49):

In experimental philosophy, propositions gathered from phenomena by induction Should be considered either exactly or very nearly true notwithstanding any contrary Hypothesis, until yet other phenomena make such propositions either more exact or liable to exceptions. (Newton 1999. P796)

Yet his over determination of natural laws relevancy seems at odds with van Fraassen's idea of what Westphal attributes to him:

'The Law of Weakening: if two beliefs are based upon and are equally adequate to the same evidence, the stronger of those two beliefs is less well justified by that evidence than is the weaker (less committal) belief. Ibid. Westphal, 2011.

Here the argument appears to be that mechanical laws are too strong in terms of what they ground. Here they seem to stand at odds with the deductions of statistical mechanics where any invariance results in overdetermination. Other arguments are given in 'Images of Science: Essays on Realism and Empiricism' 1985. p33. Richard N. Boyd. Both understandings of method; the Newtonian one of induction and the empirical adequacy of van Fraassen can be challenged. What is determinate for the relation of functions needs no adjustment and secondly what is adequate is incomplete when it comes to making successful decisions? For the Hegelian what is experienced can only be processed within a higher standpoint of system [see p580; section 3 of The Notion in General, of the Science of Logic, A.V. Miller Translation]; if there is no higher standpoint the lower one cannot be contained in it. Just being in an opposition where weakening is an inference: *if a then b; hence if a and c then b* to an inference where *a or c* counters the anti-realism grants neither this status. If both or either were valid, ceteris paribus there can be no coherence for mechanical processes given the states of their properties cannot be statistically grounded.

By setting out the structure of an inference, it can be shown how the conditions of conditionals can be used to model any process within our means. By this I mean present a set of procedures which can be seen as a cause which can raise, lower or make equal the chance of producing a desired effect. Without this rational decisions cannot be made to work. For the moment, I leave this problem with the

reader, but will specific details will be forthcoming; after my talk on 'Freedom from a belief in ungrounded probability functions'(See: abstract on p314 <http://www.uni-log.org/start4.html>.)