

The Philosophy of the Future

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Methodology

Is there a single philosophical proposition on which all philosophers agree on ? Can they even agree on what constitutes a philosophical proposition ? This is in marked contrast to the situation of mathematics and science. One could argue that modern philosophy has at least eliminated a range of hypotheses and so exhibits a kind of progress in the negative sense. But this does not seem to be the case as past positions tend to resurface albeit with different or improved arguments. And in general the desirability of constructive debate and discussion which hinges on perfect clarity and precision of language and communication is patent. Our proposal to remedy this state of affairs for philosophy involves understanding the role of the advent of formal logic and how it can effect a revolution in philosophy. Such a revolution must i avoid both extremes of the traditional Hilbertian program and the opposite position of the later Wittgenstein. The ideas of Gödel on the foundations of mathematics¹ are an example of a correct and balanced approach which does justice both to the power and usefulness and to the limitations of formal axiomatic methods. We propose taking a similar approach to philosophy as a whole. We start by noting that if there are "language games" then the fact that many people can understand the same rules, that the rules are fixed, that the game can be played correctly is saying already a great deal. Although we do not affirm with Montague² that there is no difference between formal and ordinary language we find nonetheless the task of formalizing ordinary language³ necessary and highly desirable. We will not be discussing in this essay the relative advantages of different systems which might be employed for such a task (first-order logic, higher-order logic, type theory, multimodal logics, categorical logic, linear logic, etc). What is important is to find a choice of primitive terms and a set of axioms which they satisfy that can be accepted by all (or most) philosophers and which can cover the domain of philosophical discourse. Both the analysis of ordinary language usage (which goes back at least to Aristotle) and introspection and intuition (as in Husserl's phenomenology) can be legitimate tools for arriving at the choice of terms and axioms⁴ but what is important here is the result, the arriving at the rules of a game that all are willing to play. We must distinguish the informal debate concerned with choosing the primitive terms and axioms and the formal rigorous debate which presupposes the completion of this task and proceeds in a purely logical fashion indistinguishable from mathematics. Of course, as in the foundations of mathematics, the two task can be interconnected (i.e. we would eliminate choices of axioms that lead to demonstrable inconsistency). The spirit of this endeavour is to be entirely analogous to current research in the foundations of mathematics. We are trying only to capture, to formalize, a portion or an

¹see the articles of G. Crocco, M. van Atten and R. Tieszen.

²see R. Montague *Formal Philosophy*.

³*Modal logic* is a beautiful example of this methodology and has realized to a considerable extent this project within a very restricted domain, specially that which concerns temporal logics.

⁴thus while having great respect for ordinary language we at the same time remain faithful to Frege's original aim in writing his *Begriffsschrift* so eloquently expressed in the preface.

aspect of ordinary language and human thought and do not and indeed cannot claim to be exhaustive and complete for obvious reasons. Once the terms and axioms are agreed upon all philosophical argument and debate will become a highly constructive and scientifically rigorous collaborative endeavour producing what is indistinguishable from a formal mathematical or metamathematical proof yielding permanent results and possibly to either expanding or altering the accepted axioms and terms. As in the incompleteness phenomenon for Peano Arithmetic it is possible that Kantian-type antinomies could be rigorously proven.

Ontological Pluralism

Terms like "consciousness", "experience", "perception", "mind", "reality", "illusion", "dependency", "subject", "object", "accident", "substance", "matter" are extremely difficult to define or analyse and it will certainly be a laborious task to choose the primitives constants, functions and predicates and arrive at a consensus regarding axioms suitable for a formalized philosophical discourse involving these terms. Also there is the problem of uniqueness. For example by making mind the ultimate ontological primitive it ends up sharing many formal attributes with matter as conceived by modern physics. The traditional concepts of subject and object seem to be purely abstract terms expressing mutual dependency and to have little bearing on ontology or the theory of mind, but we could be mistaken. Such statements as "The world in mental" which involve the difficult transposition of "mind" into a predicate seem very challenging to make adequate sense of⁵.

We conjecture that the philosophical attitude that will emerge if our program is carried out will be one of open ontological pluralism (OOP) in which an incomplete list of provisional primitive ontological categories will be admitted but open to the possibility of the discovery of new ontological categories and perhaps even one which could transcend and unite all others (or, at least, such a conception need not be ruled out). Thus we can say that the world consists of various types of things which includes mental things, mathematical things, material things and living things. All these kinds of things will be intricately related to each other. Many classical attempts at proving monism will be shown not to follow from the accepted axioms. Thus one positive result will be a defense against hasty and simplistic monisms or reductionisms, be they physicalist (such as Ryle) or idealist (such as Berkeley), perhaps in the style of G.E. Moore's *The Refutation of Idealism*. However we do not rule out *a priori* the possibility of a rigorous monism although what is called "the hard problem" strongly calls into question the particular case of physicalist monism⁶. And maybe, after adequate formal scrutiny, finely argued idealism may demonstrate the plausibility of a mentalist monism based on a reasonable choice of axiomatic system (though sociologically it is difficult to envision all philosophers accepting the choice of axiomatic system once the proof is known). The general spirit of our philosophical enterprise will be much akin to the tradition of Frege, Russell and Popper. Comparisons can be made to the Popperian "Open Society" and the open evolving nature of Popper's pluralist ontology of the "Three Worlds".

⁵ one might argue that in order for this statement to be meaningful one must be able to point to something to which the predicate of "mental" does not apply; but doing so will imply the falsehood of the statement. Thus it seems to be only meaningful if it is not true.

⁶An idea I wish to put forward is that when many scientists and some philosophers profess "physicalism" they are not embracing the possibility of a systematic philosophy of matter in analogy to idealism, rather they are adopting faith in a methodology which states that through continuous pursual of the scientific method and mathematical modelling we may eventually arrive at a clear concept of matter and this concept will allow us to explain the mind.

What is Real ?

We now investigate the term "reality" and the plausibility of OOP.

What is real is not only what is consistent or is presented according to perspectives capable of correction or refinement but *what there is always more to learn about and discover*. Thus persistent unity and given rise to continuously evolving epistemic content characterize reality. Works of fiction displaying the "inner consistency of reality" and the process of unfolding a the story (causing the desire to know "what happens next") are spontaneously accepted as "real" in their own way in proportion to the extent in which the author has perfected these aspects. By fiction man is paradoxically nourished by the characteristics of the "real".

Now both mathematics and the physical world as studied by science exhibit all these characteristics. The amazing adequacy and correlation of mathematics and the scientific view of the world needs to be elucidated; any attempts at reductionism in either direction must be considered simplistic and premature and so too must a specifically mathematical monism⁷ which offers no account of why mental experience contains elements quite distinct from mathematical concepts or the cognition thereof.

The above characterisation of the real is saying that reality is manifested as an inflowing source of information, because there is always more to know about it⁸.

Cultural and biological evolution can be interpreted as expressing this out-flow of this information source ontologically. And if we observe the process of the evolution of mathematical knowledge considered immanently in the human mind, we could inquire: where does this come from ? Thus we could consider the mathematical realm as the inflowing information source of the mathematical knowledge of the human mind which is also part of its evolution and that of the universe; in fact it appears to be one of the strongest known information sources⁹ just as the human brain is considered the most complex object in the universe. We can see thus the great interest of arriving at a philosophically satisfactory formal definition of "information" and "complexity".

The phenomenon of incompleteness might be interpreted as expressing the limitations of recursively axiomatisable systems for probing the over-abundance of information of reality. The difficulties in formalising quantum field theory may have a similar explanation.

Consciousness and nature are two abstractions, parts of the total process of reality. Our conceptual probing of any aspect of reality is always insufficient. But there could be eventually a conceptual merging of the classically distinct regions of nature and mind.

This unification is as if two objects having appeared distinct in less powerful telescopes were then to be shown closely united by countless subtle threads. But the imperfect concept of one apparent part was never enough to connect it to the other. Thus there is no way to derive our classical concepts of mind and matter from each other. It is also like Gödel's idea of adding a plausible axiom to ZF so that the continuum hypothesis could in fact be derived. We need to first learn much more about both matter and mind.

Is Mathematics the Common Ground of the World ?

There are inflowing sources of information in the universe. We conjecture that all finitary recursive models must fail for fundamental physics (in the spirit of the Casimir effect). And

⁷for instance Tegmark *The Mathematical Universe*(2008)

⁸it is interesting to compare this with A.G. Lisi's paper <https://arxiv.org/pdf/physics/0605068.pdf>. He shows how quantum mechanics can be interpreted as requiring a constant external information source.

⁹Algebraic Geometry, though dealing with apparently simple objects is known to be quite complex and open-ended. It has been linked to fundamental structures to theoretical physics, the most famous being the Calabi-Yau manifolds in String Theory.

analogously for biological evolution. This means that investigation into such domains will lead to ever richer understanding and discoveries, be it fundamental physics (quantum field theory, the geometry of the standard model or quantum gravity), the structure and evolution of living organisms, the brain or the phenomenon of mind. As we saw, the unveiling of the realm of mathematics by the human mind manifests its evolutionary process in the universe. The ground of this process may be the same as the one manifest in biological evolution and fundamental physics¹⁰.

Mathematics is used in physics to model and understand nature, but *mathematical activity itself reveals the nature of the human mind and brain*. Thus Penrose's proposal of a direct link between fundamental physics, brain and mind seems plausible. Can we find a kind of mathematics which has at once greatest application to physics, engages the human mind the most and appears adequate to model them? *It is this mathematics that might be the tool to arrive at our desired formal philosophical languages*. A preliminary proposal would be *Category Theory*¹¹.

On The History of Philosophy

The philosophical project outlined above casts a new light on historical and contemporary philosophy and much interesting research remains to be done in this direction. In some cases the convergence may be quite substantial and profound despite the use of a different terminology and in other instances the resemblance may be superficial and misleading. Also many historical philosophies can be reinterpreted in a novel way. At this stage of our investigations we seem to find a parallel in the Organic Philosophy of Alfred North Whitehead which while being an all-encompassing world-view in the style of Leibniz or Spinoza holds an even balance between the physical and mental. Also the concept of *process* (or evolution) plays a key role. It is tempting to see Whitehead's concept of Creativity as the information source we discussed above. There also are certain superficial agreements with the naturalism and holism of Quine. A definite appraisal of the Hegelian tradition will depend on the possibility of its formalization¹².

Our project is in fact to achieve a rigorous formal realization of the Platonic dialectic and a dialectic has only the semblance of relativism. It is a self-correcting evolutionary process, manifesting the objective through the progressive unveiling of new axioms and concepts.

The spirit of our enterprise gives new value to historical testimonies of attempts at rigorous formal logical and axiomatic thought even if these manifested in the context of relativism, conventionalism or nominalism. Thus we attach a high value to the spirit and some of the material present in Ockham, the crown of a rich and neglected medieval tradition and in India Nāgārjuna¹³. The Platonic and Aristotelic texts are actually rich in potential formal and dialectical material.

Logic, therefore, is not a tool; it is an open-ended, evolving science having an ontology of its own. Mathematics is but one of its parts, and its full scope is yet to be discovered. Given

¹⁰The gradient of the ground's mathematical manifestation seems to be in modern algebraic geometry. Mysterious harmony and complexity is perceived in the quest for adequate invariants of algebraic varieties and this can be related to theoretical physics by M. Marcolli (*Feynman Motives*).

¹¹ It is the key of Grothendieck's development of modern algebraic geometry. The mind can be approached from the point of view of logic, type theory, programming languages, complex systems, cognitive science and linguistics, all of which can be studied from a categorical theoretic perspective (Lambek, Scott, Goguen, Coecke, Voevodsky). Voevodsky's Homotopical Type Theory is a bridge between geometry and logic. Sheaf theory (topos theory), fibered categories and closed monoidal categories have equal footing in geometry, physics, logic and computer science. Concurrency, networks and general systems can be studied using lattice theory and sheaf theory.

¹²cf. the correspondence between Gödel and Günther published in the *Collected Works*.

¹³cf. Jan Westerhoff, *Nagarjuna's Madhyamaka* and Graham Priest, *The Logic of Catuṣkoti*.

the definition of validity, every necessary thought whose analysis contains only purely logical objects is valid. So every time we discover a purely logical analysis of a concept previously thought to belong to a discipline outside logic, the acknowledged scope of logic must be expanded accordingly. The purely logical analysis of number is just one case in point, and I submit that there are many more. In this vein, I will in the closing chapter venture into an area that on the face of it might seem to some as foreign to logic as mathematics once did, namely, the area of intentionality, mind, and consciousness. If there is anything in the analyses I will offer, then the conception of logic that emerges is very far indeed from that of Aristotle, for whom logic is primarily a tool; instead, it is more like that of Plato, for whom logic is akin to reason itself.

- George Bealer, *Quality and Concept*, pp.220-221.