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Interview with Graham Priest

"Philosophy has been going strong in every major culture for two to three millennia. It deals with problems of central human concern and is not going to disappear as long as there are thinking human beings."

Graham Priest. Photo by: Lars Mogensen. Source: https://sverigesradio.se/avsnitt/58862.

We at *Godelian Letters* are honored to interview Graham Priest, a Distinguished Professor of Philosophy at the CUNY Graduate Center, New York, and a regular visitor at the University of Melbourne, where he was Boyce Gibson Professor of Philosophy and also at the University of St Andrews.

He was born in 1948 in London. He read mathematics and logic at St. John's College, Cambridge. He obtained his doctorate in mathematics in 1974 at the London School of Economics. By that time, he had come to the conclusion that philosophy was more fun than mathematics. Since then, he dedicated his professional life to logic and philosophy.

Much of Prof. Priest's work has been in logic, especially non-classical logic and related areas. He is perhaps best known for his work on dialetheism, the view that some contradictions are true. However, he has also published widely in many other areas, such as metaphysics, Buddhist philosophy, and the history of philosophy, both East and West.

He is the author of numerous books and has published articles in nearly every major philosophical and logical journal.

More details about his activities and publications can be found on his website: grahampriest.net.

GL: Stephen Hawking, the prominent Cambridge physicist, once said: "Philosophy is dead." Is this statement true? How useful is Philosophy for science or economics today?

GP: *Well, I'm afraid that that isn't true. Philosophy is alive and well in the many countries I know. People are still finding new problems and new solutions to old problems. In particular, philosophy interacts with every other form of inquiry, and this is a source of philosophical impetus. Philosophy has been going strong in every major culture for two to three millennia. It deals with problems of central human concern, and is not going to disappear as long as there are thinking human beings.*

Many other theoretical inquiries, including the natural and social sciences, broke off from philosophy at some stage. After this happens, the inquiries tend to go on, for the most part, without the help of philosophy—but not completely. Every scientific theory makes certain fundamental assumptions, whether it be quantum mechanics, contemporary economics, or anything else; and these are always subject to the possibility of philosophical scrutiny, evaluation, and rejection—particularly at those times when the inquiry gets into real trouble, as the historian of science Thomas Kuhn famously pointed out.

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GL: You are one of the pioneers of Paraconsistent Logic. In my layman's understanding, this is a system of logic that allows for a certain range of contradictions. How could logic allow for contradictions? Isn't this like science allowing for a certain range of alchemy?

GP: *No. The principle of* Explosion *is one where a contradiction entails everything; that is, for any A and B, B follows from A&~A. So, for example:*

"Donald Trump is corrupt and Donald Trump is not corrupt" entails "Hydrogen has atomic weight 157."

A Paraconsistent Logic *is, by definition, one where Explosion is not valid. Explosion is a highly counter-intuitive principle of inference. The corruption or otherwise of Donald Trump would seem to have absolutely nothing to do with atomic weights. It is not orthodox in the history of Western logic. Aristotle, for example, says that it is not valid. It seems to have been discovered/ invented in Paris in about the 12th century, and was, at the very least, moot in Medieval European logic, becoming orthodox around the start of the 20th century, to be contested again by contemporary paraconsistent logicians.*

Moreover, much reasoning in the history of science has clearly been paraconsistent. There have been times when an accepted theory has been inconsistent, and known to be so, such as Newtonian dynamics, based as it was, on the early infinitesimal calculus, and the Bohr theory of the atom. And inconsistent pairs of theories have been accepted at the same time. In the late 19th century, the theory of evolution required life on the Earth to be older by many orders of magnitude greater than orthodox thermodynamics allowed. And if I understand matters, the current theories of quantum dynamics and general relativity are not mutually consistent. Yet scientists do not, and never did, infer arbitrary conclusions in these sciences. Alchemy tried to get gold out of base metals, from which it could not come. For scientists, applying Explosion would seem to be like trying to get a conclusion out of premises from which it does not come.

GL: Aristotle's logic dictates (in general) that for every question, there is an answer: yes or no, true or false. Gödel came and said there was a third option: to be undecided. For Gödel, not every question can be answered. There are many questions for which there is no logical way to decide the answer. Isn't this good enough to address contradictions?

GP: *Aristotle does endorse the Principle of Excluded Middle (everything is either true or false) in the* Metaphysics*, though there is a very famous passage in* De Interpretatione *where he appears to deny it. Gödel's result does not deny this principle. It shows that in every consistent mathematical axiom system of sufficient power (which has a specific technical definition), there are things that are not provable. Of course, these things can be proved in a stronger axiom system, but, in that, there will be, in turn, things that are not provable. More importantly, provability and truth are not the same thing. And even Aristotle (as far as I know) did not claim that everything true is provable.*

> *Even Aristotle did not claim that everything true is provable*

Many modern logicians have claimed, for a variety of reasons, that there are things that are neither true nor false. Whether it is plausible that paradoxical sentences might have such a value depends very much on the paradox in question. The move has been a popular response to some of the paradoxes of self-reference, most notably the Liar: "This sentence is false." This sentence is true if and only if it is false. If it is neither, paradox is avoided. However, this suggested solution faces many well-known problems. The most obvious is that one only has to tweak things a little to regain the paradox. Merely consider: "This sentence is either false or neither true nor false." If it is true or false we have the usual contradiction. But it if is neither true nor false, it is true, and so we still have contradiction.

GL: Can't we say the enlarged version is also undecided, *ad infinitum*?

GP: *No, you can have as many non-classical values as you like. Consider the claim, "This sentence is false or has one of these values." Whether it is true, false, or has one of these values, a contradiction arises.*

GL: Logic plays an important role in Artificial Intelligence. How does Paraconsistent Logic contribute to AI?

GP: *There are many different kinds of AI, and some of them do not really involve formal logic at all (notably, those that are based on artificial neural networks). However, some AI systems do depend on theorem-provers, which use systems of formal logic. Results are deduced from a database, and for any database of sufficient power, a paraconsistent logic is necessary. This is because data can be inconsistent: it can come from multiple sources, be inaccurate, and so on. Nor is there any algorithm for determining when a set of data is inconsistent. In such a case, one really does not want to use an inference engine that implements Explosion, or it is liable to give totally spurious answers to queries, since anything then follows if the data is inconsistent.*

> *For any database of sufficient power, a Paraconsistent Logic is necessary*

GL: In Einstein's theory of relativity, two persons traveling at different speeds will measure time differently. Einstein says both are right. Is this relevant to Paraconsistent Logic?

GP: *No, I'm afraid not. Measures of space and time are relative to a frame of reference. So the time between two events can be, for example, 10 seconds* with respect to frame of reference *A, and 20 seconds* with respect to frame of reference *B. But this is no more a contradiction than the time being 17.00* in London*, and 12.00* in New York.

GL: Behavioral Economics assumes people to behave, at least on some occasions, irrationally, i.e., they may make inconsistent choices. Is this also relevant to Paraconsistent Logic?

GP: *Standard economics has a seriously warped account of rationality. The rational agent is one who acts in such a way as to maximise their gain. So it is irrational to act in such a way as to lose a good with no counter-weighing compensation. This makes most acts of compassion, for example, irrational. So standard economics makes much moral action irrational. This is crazy.*

> *Standard economics has a seriously warped account of rationality*

However, having said this, by any standards of rationality, people do act irrationally sometimes. They might do this in different ways. One way is to prefer a to b, b to c, but prefer c to a. If they take preference to be transitive, they also prefer a to c. So, by the meaning of 'prefer', they do not prefer c to a. So they take a to be preferable to c and not preferable to c. So their beliefs are inconsistent. Their beliefs had better not, then, be closed under Explosion, or they would prefer everything to everything, which they presumably do not. So if their beliefs are closed under logical consequence, it must be a paraconsistent one. (Actually, though, only some kind of ideal agent has beliefs that are closed under logical consequence; no real agent has the ability to figure out all the logical consequences of their beliefs.)

GL: Economic textbooks unanimously assume preferences to be "complete and consistent." Doesn't this make preferences "closed under logical consequence"?

GP: *No. Let x be some agent, and let X be the set of statements concerning the preferences of x. The fact that for every A in question, either A or ~A is in X, and it is not the case that both A and ~A are in X, does not imply that X is deductively closed (as simple models demonstrate).*

GL: Nature appears to be consistent. We do not observe contradictions in nature; at least, that is what most scientists and mathematicians seem to think. Does this mean that paradoxes reflect the free will of humans? For example, the Cretan was free to say or not to say: "All Cretans are liars." But an atom or a particle is not free to lie. Is there a link between free will and contradiction?

GP: *Well, I don't think that accepted scientific science is always consistent. (See above.) But, in any case, why think that science tells us all the things that are true? Judgments of ethics, law, aesthetics, logic, mathematics, appear to be true or false; and these areas are not in the domain of empirical scientific investigation.*

> *Why think that science tells us all the things that are true?*

On the other hand, paradoxes of the liar have nothing much to do with free will. The liar paradox is about the truth or otherwise of the sentence "This sentence is false." No one has to utter it, or make a judgment about it.

Finally, it is true that there are pretty plausible reasons for supposing that we have free will, and pretty plausible reasons for supposing that we do not. I don't think anyone has actually suggested that both conclusions might be true, but I suppose that someone might argue this.

GL: Do you think Nature is free from contradictions?

GP: *Well, I'm not sure what you mean by "Nature." If nature comprises people and stars, atoms and oceans, then both the claim that it is contradictory and that it is not contradictory are category mistakes. It is* statements *that are the kind of thing that are consistent or inconsistent. Perhaps you mean: are there empirical statements that are* ***dialetheias****? I take it that the answer is* yes*. For example, if an empirical system is in an instantaneous change between A holding and ~A holding, where the prior and posterior states are symmetrically related, then A&~A holds at the instant of change.*

GL: Many thanks for the insightful and constructive discussion!