

Logic and the Self: After Certain Crises in Western Thought

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It is a great honor to receive this Prize, and indeed an even greater honor for me to share this with Professor Casari. But I am very conscious that we are here in the first instance to honor the memory of Professor Giulio Preti. I have had but limited access to Giulio Preti's thought, through some articles that appeared in English and French, and most specifically through an illuminating article by Professor Peruzzi.¹ But since then I have reflected especially on the time and circumstances of the young Preti, in the 1930s, and how that time relates to ours.

I. The sense of crisis, then and since then

The time of Giulio Preti's initial studies, the 1930s, was a time of cultural and intellectual as well as political upheaval. The title of Husserl's work, written in that decade, was indicative: *The Crisis of the European Sciences*.² But this was Husserl's last and unfinished work, a culmination of a growing sense over four decades, of the foundations of systematic scientific inquiry falling apart and in great need of renewal. There was in those decades a tangible sense of crisis in Western thought. All the same it was also a time of great intellectual optimism. As is sometimes said, every crisis is an opportunity, a chance to rise above what we have been. But looking back to this, I have a puzzle.

1.1 The puzzle, for us, as we look back

Why is it that in the time of the young Preti, philosophers had an acute sense of crisis in Western thought, and that in the last few decades, in so much of philosophy, there is no sign of any such sense of crisis?

We can imagine three possibilities. It could be because there was a crisis and the problems have been solved, that Western philosophical thought has been placed on a new and firm, stable, solid basis. It could also be because the earlier sense of crisis was based on a mistake, that it was more due to the social, cultural, and political crisis of the West in the first half of the twentieth century. Or finally, more disturbingly, it could be because Western philosophical thought really was in crisis, the crisis was neither averted nor its problems solved, but that philosophers have fallen into a

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false sense of security. Which of these is our actual situation? I am not in any way equipped to investigate possible connections between the social and political crises of that turbulent last century and our intellectual pursuits. But I propose that we look closely at the putative crises addressed or displayed in philosophy during that time, to obtain some clues to an answer to this question.

1.2 A geometric analogy

Just to help our imagination, I would like to propose a geometric analogy that could illustrate the sort of crisis that can happen, and could be overcome, in scientific and philosophical thought. That analogy is the possibility that we are living in a space that is admittedly unbounded, but finite. This sounds and is paradoxical. If our space is unbounded, we are never precluded from continuing a journey in the same direction. But if it is then also finite, the journeys possible for us are all below a certain finite length, since we occupy finite regions in that space – we are not extensionless points that could remain forever at infinitesimally far from any given point. Since space is certainly very large, we would not actually verify the finitude in experience, but though unseen, all our movements would be thus confined.

Such a space would have, in the technical sense, positive curvature. In the nineteenth century the German mathematician Gauss showed that we could detect that sort of curvature of space, at a given locality, by internal measurements (Gauss 1870; cf. Coxeter 1977). Such measurements would then give us the startling realization that we might well not be dwelling in an infinite universe: a drastic change to our world picture. In the new world picture we would then conceive of ourselves as inside a finite realm, with no possibility of being physically outside it, with no experience of limits or boundaries, only an intellectual God-like comprehension of our situation.

I know this is a fantasy, to some extent, but it could give us a sense of what a true philosophical crisis could – or should? – feel like. In any case, the example introduces the development of non-Euclidean geometry in the nineteenth century, which was itself already an intellectual crisis, and the beginning of the great Scientific Revolution of that time. I will not call that development, in itself, a *radical* crisis, however. I will not call it ‘radical’ precisely because it allows still for this intellectual grasp, this comprehension from a physically impossible but conceptually possible vantage point *outside*. With respect to the global structure of physical space or space-time, the mathematicians have actually enabled us finite mortals to achieve a view from nowhere, upon our situation. In the development of mathematics we have seen the creation of a much larger conceptual framework in which these possibilities can be viewed not only as problems seen from within, but as ‘*aufgehoben* in a larger unity’.

What then is, in contrast, a radical crisis? It is a situation in which the problems and limitations of our conceptions become visible solely in the form of anomalies and paradoxes, self-contradictions, from within, with us having even in principle no way to transcend all viewpoints subject to such irresolvable tensions.

1.3 Have we encountered what appeared to be such radical crises?

To all appearances, yes.

Here I think we come to the answer to our first question: what explains to us, in retrospect, the sense in the time of the young Preti that Western thought had devolved into a state of crisis. The symptoms were, perhaps paradoxically, all the great efforts at construction of viable new world-pictures and the loud claims of how the problems had been solved by conceptual revolution. As Peter Galison has emphasized, it was a period when the very prevalence of the word ‘Aufbau’

signaled the sense of need for reconstruction.³ With those claims came of course the realization that the established intellectual order was apparently subject to, and could come to be in need of, revolution

Rather than address this in a purely general form, I want to go into the two great examples that I see as still, or again, capable of rousing us from any dogmatic slumber. The first example is what everyone refers to as the second great Scientific Revolution, in the decades around the year 1900. The second example, acutely present as well in the years of Giulio Preti's youth, concerns language and logic, truth and paradox, and implicitly, profound and inevitable limits to our self-conception.

2. The Scientific Revolution of the decades around 1900

I won't remind you of the details of the revolutionary developments in both physics and biology around 1900, they are too well known, having been chronicled so ably by Thomas Kuhn, his followers, detractors, and commentators. Rather I want to point out how that sort of radical conceptual change is literally *confounding* for the actors involved.

Those who live through a conceptual revolution are participants brought up and educated in a prior accepted conceptual scheme. They are actors whose thought was initially assimilated to a prior world-picture that dictated what makes sense and what does not, what is absurd, what is nonsense, what is or is not intelligible.

Thus dictated are, in part, what possibilities are simply ruled out as having zero probability, and what could possibly be a hypothesis that could even in principle bring gain, success, and progress to science. So how can there appear a *possibility of change* that breaks out of this framework?

2.1 Scientific revolution/conversion as a decision problem⁴

Pascal's paradigm for decision making was succinctly summarized in *The Port-Royal Logic* by:

To judge what one must do to obtain a good or avoid an evil, it is necessary to consider not only the good and the evil in itself, but also the probability that it happens or does not happen; and to view geometrically the proportion that all these things have together. (Arnauld and Nicole)

What theoretical problem does scientific revolution pose for decision theory? When we come to the sorts of decision involved there, the contemplated outcomes involve factors that make no sense from the anterior point of view. The problem is that if we try to think about whether a given decision or change is good, we are evaluating it by our current standards, our current assessments of probability and value.

Imagine that we need to evaluate an outcome, and we recognize that it includes, by our present lights, ourselves speaking and thinking nonsense, while faring materially much better. Does that make sense? Imagine yourself totally inside a scientific world picture that is becoming burdened with more and more blatant anomalies, severe calculational difficulties, failing predictions, and epicycle-laden explanations. An alternative appears – some people are beginning to talk about a strange new theory that makes absolutely no sense, and violates the most basic current commonsensical expectations of what nature can be like. What is still classified as a satisfactory outcome? To solve the problems of course! Here is how it would look. Taking some absurdity seriously *does not count as a solution*. Even if it did, one would have to be an imbecile to expect that it will be vindicated by future experiments. If you stop for a moment to envisage yourself converted to those

strange new ideas, you see yourself stooping to blatant nonsense, you hear yourself babbling with (*c'est le bouquet!*) an air of having explained the inexplicable.

What could possibly change this evaluation of an embrace of such a conceptual reversal? What we need to find is this: *something* that can play the role of changing the basic parameters of our problem situation, the very parameters on which decision-theoretic reasoning depends. As an empiricist, one cannot simply add this *something* by postulational fiat. Is there anything in our experience to play this role?

We can certainly see such transformations through emotion *in the terms* of the decision paradigm whose anomalies they are. The values of the possible outcomes of various actions are changed, in a way that changes the action itself into something different.

In the case of an emotion-driven 'way out' from a problem situation, the assessment of various outcomes as satisfactory or disastrous changes, although from a purely neutral point of view the action and outcome has not changed. Physically, chemically, physiologically there may be no change at all.

Another, still more clearly cognitive, aspect of the situation also changes in emotion. What seems *possible or probable, impossible or improbable* is no longer the same. But when those two sorts of aspects change, the values and the probabilities, then the situation as conceived in decision theory is what changes. What appears to us as satisfactory by way of action is entirely determined by these factors. Change those factors and what is satisfactory or acceptable to us changes.

There is a logical gap between the prior and posterior epistemic state when they differ on what counts as intelligible. Something is needed to play a certain role in the transition: the *something* we asked for at the end of the last section. The problem is that if we try to think about whether a given decision or change is good, we are evaluating it by our current standards, our current assessments of probability and value. Therefore, if the change envisaged is a change in those standards, probabilities, and values, it is automatically evaluated as absurd. Within the prior conceptual framework, any rival framework is logically absurd.

So, in what sense, could one see the decision to change as an option at all? How could one evaluate it as doing anything but leading to pure nonsense? How could one possibly attach a value to it? We need to answer these questions because, however they look within the decision-theoretic framework, the fact is that we are able to 'step back' from ourselves, and discern, evaluate, and change our values.

Diagnosis: This is a problem of self-reference, cropping up within decision theory (cf. Savage 1954). For in rational decision theory, the good is calculated on the basis of given factors – and here we are asking for a decision to embrace rivals to that 'given', a decision to break out of the very decision-context in which the decision is to be made.

It is no wonder that in practice, everyone agrees, the scientific revolutions happen only with the passing away of the older generation, and that they can be applauded only in retrospect. But that is a shallow reaction. Given what we know about ourselves and about our history, and what we endorse in that history, we cannot just dismiss conceptual change as fortuitous, fortunate or unfortunate, 'leaps' beyond rational accounting.

2.2 A geometric analogy revisited

Remember now my example of living in a space that is unbounded but finite. Is that how we can think of how we are immersed in our current conceptual scheme? *Yes and no!* In retrospect, after the change, we can find a place for our past, superseded concepts. But if we consider the decision situation beforehand, the analogy breaks down.

When thought goes into crisis, it is because both conceptual and empirical anomalies are accumulating. The point to appreciate is that problems are classified as *anomalies* only retrospectively. They cannot be so classified beforehand – at that time they appear simply as difficult problems to be solved. You know the slogan: when the going gets tough, the tough get going!

2.3 An existentialist reaction?

The 1930s, when Giulio Preti was young, was the time in philosophy where both Husserl's phenomenology and the Vienna Circle's logical positivism were encountering their own anomalies (as we now see it!). It was also, and this is not a coincidence, the birth of the new Existentialism. To my diagnosis, that a radical crisis is a crisis of self-reference, I want to add the diagnosis proposed by the Existentialists.

A point where a way out of the problem situation is one that can, by its very nature, not admit of prior justification, is a point where the entire responsibility for the outcome rests on the decider's shoulders. It is not a point where one could sanguinely say that all choices are equally good and equally bad. On the contrary, each may have devastating consequences, and none can be excused by pointing to prior justification, and certainly not by lack of justification for its alternatives. So any decision at such a point is one with inevitable 'dirty hands', as Sartre dramatized.

So far I have argued in a way that some find irresistible, but certainly not all. The mainstream Western philosophical tradition shies away from existential dilemmas, and harbors many arguments to the effect that all conflicts are rationally resolvable. So the question, which I have tried to answer but which will for many be still unanswered, is whether this assessment is truly inescapable, as Existentialists from Pascal to Sartre argued.

Allow me to proceed somewhat indirectly then. Let me put this question of the rationality of conceptual revolutions aside for a moment, and let us make a detour here to what at first looks like a very different intellectual milieu. I mean the milieu of the logicians. For there is where we encounter *the second radical crisis in Western thought*.

3. Logic and the Self

While the great scientific revolutions in the decades around the year 1900 were replacing entire world pictures, philosophical attention was simultaneously shifting toward the subject, the individual, and the language within which the individual engages with that world.

Surprisingly, there was every sort of effort to eliminate the subject from the theory of language, to abstract from features of the user of language and his worldly engagement. These efforts were not universal. All across Europe and America there were little groups – such as Lady Welby's circle in London and the Significs group in the Netherlands – that insisted on the special role of first-person language, indexicality, and self-reference (Peirce and Welby 1977; Schmitz 1990). But more tellingly, where those effects occurred they were stumped in various ways. The form this sort of effort took was the construction of model languages that would faithfully represent all the legitimate and needed resources of the language of the scientist. Crucially, this construction was itself to be carried out within those very same resources. And here the famous paradoxes of that period took their toll.

3.1 The main results

The most famous result was Goedel's theorem (Goedel 1931). This result has since then been too often abused and distorted, but its lesson keeps its impact no matter how prosaically it is presented.

It literally destroyed the idea that we can have a God-like view of mathematics from within a purely finitist vantage point. The book of nature, as Galileo so famously said, is written in the language of mathematics. But now we know that if the scientist is to read the book of nature, he will have to speak and read that language as a native, as someone who learned it as a baby at his mother's knee, and not as a scholar who possesses a representation *of* that language. The vaulting ambition of the image of such a detached yet all-understanding scholar came to light and was exposed by Goedel's result. An ambition that had seemed to be within our rights turned out to be one of the Illusions of Reason.

I call this a paradox, for nothing seems more natural than to think that we can have, or indeed do have, a language that can express everything expressible, and within which we can build adequate representations of everything representable. It is shocking to the imagination to be told that in this simple and seemingly natural thought we were like a poor sorcerer's apprentice, unaware of the abyss just beyond everything we touched, dealing in unattainable, even inconsistent, ideals.

Similar shocks quickly followed in the time of the young Preti. We live in our natural language, but we also study it – how can this be, when the study must be in the very vehicle that is the object of study? Since the beginning of philosophy we have sought the criterion of truth, the line of demarcation between what is true and what is false. But here comes Tarski's result, complementary to Goedel's: any proposal to formulate such a criterion, applicable to the very language in which we live, is subject to a *reductio ad absurdum* (cf. Tarski 1983).

3.2 Shocks to metaphysical realism, but also to the ideal of a cognitive science

Some decades later, the American philosopher Hilary Putnam used the results of that time to mount his argument against metaphysical realism (Putnam 1976 and 1977; cf. van Fraassen 1997). If we suppose that there is a language in which all that is representable can be represented, and that there is in that language One True Story of the World, we are quickly hoist on our own petard, for these suppositions imply their own negation.

Although that much is well known throughout the philosophical community, there is today, in much of what is known as 'mainstream philosophy', no sense of crisis. These paradoxes seem, after all, to appear on a very abstruse, abstract level. They seem far away from our practical concerns, even if they apply to the very language in which we do everything we do every day.

But there are corollaries, that have recently appeared, hitting close to home. I mean, results building on Goedel's and Tarski's famous results, that affect our conception of ourselves *as subjects of cognitive science*.

Let us admit this at once: we cannot very well pretend to know that we have intellectual resources that go beyond what any possible computer could simulate. This realization places a constraint on how we can represent ourselves. Most especially, it constrains what a scientist can construct as a representation of our cognitive states and processes. Even if we were not prudent in our pretenses along these lines, naturalism is so strong a tendency in current philosophical circles, that cognitive scientists would quickly be criticized if they did not respect this constraint. But – and here the paradox re-enters – that constraint automatically places the scientific representation of cognition within the realm where those devastatingly far-reaching limit results obtain.

To put it bluntly, if a scientist could offer an adequate and complete representation of cognition, and then took that to apply to himself as well, he would find that he had contradicted himself.

All his careful and prudently humble depiction of how we think comes to naught, as soon as the scientist counts his own intellectual constructions, his own theories and models, within the domain of his or her science. Above I diagnosed the problem of rationality of conceptual change as hinging

crucially on self-reference. Here, among the logicians, we encounter a rigorous proof that the idea of self-understanding through a rigorous scientific model alone is a tower of Babel, destined to collapse under its own weight (cf. Cross 2001; Putnam 2006; Thomason 2011; van Fraassen 2011).

4. The fundamental problem situation

There is a common thread in these conceptual difficulties. Both in decision theory and in the theory of language and meaning, we find that it is quite possible and feasible to construct working representations of *local* situations.

When it comes to a decision to be made in a fixed and given context, where the values and probabilities are set for us or by us already, the pattern to be followed is clear and indeed compelled by rational deliberation. It may not be easy to do so, but the problems to be solved have a determinate and well-understood form.

When it comes to a form of discourse that has its subject pre-defined, the vocabulary and grammar and the like historically given or demarcated, the task of representation is not easy but in principle solvable. It is a problem with the typical form of a scientific problem, not so different from the projects of the natural scientist.

And similarly for the study of cognition, when the attention is focused on specific skills and resources, with prior demarcation: the models that can be constructed present problems, however difficult, only with the sort of difficulty that was encountered everywhere in the history of the natural sciences.

But in each of these cases, the attempt to apply that form of representation to our own situation, self-referentially and taken as a whole, in full completeness, turns out to run into strict logical impossibilities. It reduces itself to the absurd. It becomes an instance of what Kant called the Illusions of Reason.

We can sum it up, though metaphorically, with Gerrit Mannoury's phrase, in his 1907 review of Brouwer's dissertation that inaugurated the Intuitionist movement of the early twentieth century: *A fish you can filet, but not the Universe.*

5. Where are we now?

At the beginning I expressed the puzzlement I feel when reflecting on the history of philosophy of the past one hundred years. If there was such a sense of crisis in Western thought less than a century ago, in the time of the young Giulio Preti, and no such sense of crisis to be found in mainstream philosophy of these past few decades, what happened?

Was the crisis creatively overcome, with finality and a sense of solution or resolution? Or was it a false sense of crisis to begin, based on a mistake? Was it perhaps a displacement of social and political agony to the realm of the intellect, a projection of personal or social despair in times of national crisis onto the philosophical firmament?

Looking back to history, some writers have condemned the later Middle Ages for sapping the vitality of the great philosophies inherited from the ancients by a dry, scholastic, language and logic mongering. They are perhaps reminded of Nietzsche's verdict, in *Philosophy in the Tragic Age of the Greeks*, on the fate of Greek philosophy, as having similarly passed in late antiquity from healthy realism to the dry logic of skepticism. Others, however, see the late medieval nominalists as the true birthplace of modern science and philosophy, as necessary to the birth of the modern era as the splendid excesses of the Renaissance. We may be tempted to see, in the twentieth century, a fast transition from exuberant renewal in philosophy to scholastic decay, or

we may speculate that this turn to a deeper reflection on language is the necessary prelude to revival.

The most disturbing specter haunting the philosopher is undoubtedly the third possibility envisaged above. That is, that the crisis is real, but neither solved nor averted, that it became too hard for philosophers to face, and that we finally succumbed to denial, in the clinical sense of the word.

This last answer was advanced, perhaps embarrassingly or inopportunistically early, by the Existentialists. If these paradoxes teach us that we cannot be in conceptual or intellectual control of our situation in the world, any more than we can be in physical control of our fortune or our future, then we will be tempted to give way to false consciousness, for the burden of living with no firm ground to be found anywhere for our feet is too great.

But existentialism always offered two paths for choice: existential despair or decisive yeasaying. My hope is that we will take the latter path. I recognize that successful solutions for local – logical, semantic, or epistemological – problems cannot provide us with a pattern for understanding ourselves and our situation in the world taken as a whole. I admit that I, along with perhaps most of the philosophers of my time, have often preferred to work on those solvable problems with a pretense of still addressing the great issues in philosophy, despite the proofs we have that this is a self-refuting ideal. But I live in hope ... if we can bring the terrifying insecurity at the heart of our intellectual enterprise to light, and keep it clearly before our eyes, then at least the philosophers who follow us – perhaps even we ourselves! – will find a way to live with that, now still terrifying, clarity.

Notes

This lecture was given in Florence at the award of the Giulio Preti International Prize on November 15, 2009.

1. Mari 2005; Peruzzi 2007; Scarantino 2004. A very good source is to be found in Petitot and Scarantino (2001), but unfortunately I did not have access to this before the occasion of the Giulio Preti Prize ceremony.
2. Husserl's work traced the crisis he witnessed back to the seventeenth century, in an alienating orientation toward nature, exemplified in certain respects in Galileo's scientific approach, but like others in this epoch Husserl offered constructive approaches to overcoming the crisis. It was only with the Existentialists and the logicians that certain literal impossibilities in our self-conception came to light.
3. Galison 1990 describes the ubiquity of 'Aufbau' in the titles of German-language scholarly and cultural publications between the wars.
4. This is discussed at length in chapters 3 and 4 of van Fraassen 2002.

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