

An Oriental Approach to the Philosophy of Information

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Abstract

The opening sentence in IACAP's history reads that 'the convergence of computing and philosophy has a lineage going back to Leibniz, his "calculus" and his "adding machine."' It is obvious Leibniz is regarded as key figure in forming the new philosophy. In 1992 and 2002 both 'computational turn' and 'information turn' were proposed respectively. Both 'turns' mean that PCI or simply PI is being taken as an orientative rather than a cognitive philosophy. Cognitive philosophy concerns much more with 'what', taking philosophy as an activity pursuing the establishment of knowledge and the corresponding systems. Orientative philosophy, on the other hand, inquires about 'how', i.e., it points out the orientation of our interests to a specific field or direction and more importantly it puts emphasis on the methodological aspect of this philosophy. Any school should be rooted in its own context of thought from philosophical traditions. In this essay I argue from a logical way that Leibnizian philosophy brings about a new tradition in the philosophy, i.e., the formal tradition in addition to the classic (Platonic) and modern (Kantian) traditions. The line of arguments follows four milestones in Leibniz, Bertrand Russell, Clarence I. Lewis and Saul A. Kripke. The essential notions are logical calculus, the material implication system, the strict implication system and the semantics of the possible worlds, which brings Leibniz metaphysics into the modern philosophical discourse. The rediscovery of Leibniz reveals his lifelong relationship with China as a proto-Sinologist, who not only interpreted the formal system of the hexagrams in the I-Ching, one of the oldest classics in China, with the binary arithmetic he worked out but also integrated an oriental organic naturalism into his philosophy. Following Leibniz, I also make a new synthesis with modal informationalism from an oriental perspective in the effort of coping with the dilemma concerning the ontological position of information.

In 1992 and 2002 both 'computational turn' and 'information turn' were proposed respectively, which resulted in cyberphilosophy, a term designating 'the intersection of philosophy and computing', a new philosophical field refers either to the Philosophy of Computing and Information (PCI) or simply to the Philosophy of Information (PI). The scientific concept of 'information' is formally accepted in philosophical inquiry.

The shift based on the PI can be seen as a mirror of the shift from the industrial to the information society. And from the perspective of the history of philosophy, such a shift is regarded as a shift of a large tradition. Then what is it? In the opening sentence in IACAP's history reads that 'the convergence of computing and philosophy has a lineage going back to Leibniz, his "calculus" and his "adding machine."' It is obvious Leibniz is regarded as key figure in forming the new philosophy under discussion. In my opinion, Leibniz opened up a new tradition in philosophy some 300 years ago.

Now let us examine several milestones along the logical line of argument to see this tradition initiated by Leibniz. Western philosophy can be categorized as classic, modern and formal traditions at large. According Mu Zongsan, these are Platonic, Kantian and Leibniz-Russellian traditions. Here the formal tradition or the Russell-Couturat line is concerned with which is known to the philosophers of the Anglo-American tradition due to the works of Bertrand Russell and Louis Couturat.

The contribution of Leibniz is that he was the first to express the propositions in algebraic forms transferring logical inference into calculus. Since the formalization by Leibniz, the original logic system had become more stable. But the work in this phase of formalization was still limited in the traditional logic. The system from the algebraic logic of Leibniz to the mathematical principles of Russell constituted the 'material implication system'. In 1918, Clarence I. Lewis put forward the strict implication system.

Lewis employed two modal words -- 'necessary' and 'possible' -- on which the 'strict implication' calculus systems were constructed, which means that he initiated the 'modern modal logic'. Lewis not only improved Russell's system with his construction of strict implication system but also revived Leibniz's theory of possible worlds, the central doctrine of Leibniz's metaphysical system. Later, Saul A. Kripke put forward the 'theory of possible worlds' in modal logic semantics. It is often said that Kripke is à la Leibniz, which means his semantics is created according to the

ideas of Leibniz. It was Leibniz in the seventeenth century who employed the concept of 'possible worlds' for the first time when he was constructing his philosophical cosmology.

The contemporary development of the theory of possible worlds is also valuable for the philosophy of information. However, the ontological position of information is not determined as yet from the present situation of inquiry. Just as Jon Barwise said: 'the place of information in the natural world of biological and physical systems is far from clear.' On the other hand, Luciano Floridi also employed the materialistic and idealistic dichotomy we are familiar with to raise it as a major open problem. Essentially, Floridi is arguing that if one drops the Descartes' dichotomy, i.e., information is both different from physical and mental, whether information itself could win an independent ontological category? I should say this situation is rather similar to that Leibniz met some 300 years ago. For at that time, he also faced two irreconcilable conflicts of theological idealism and atomistic materialism, which never got a successful solution in the history of European thought. Leibniz became a bridge maker trying to solve the antimony. Actually, Leibniz had already made a new synthesis prior to Kant. In effect, he introduced the organic worldview from the Neo-Confucianism to integrate the split he was facing. That's why I cherish Leibniz in the present situation of the ontological position of information.

After the establishment of the semantics, the nature of the possible worlds has been widely discussed among logicians and various views have been proposed. Among which there are two famous realist interpretations, i.e., David K. Lewis' radical realism and Kripke's soft realism. The radical realism is also called modal Platonism, a dualist interpretation in terms of Platonism, which was criticized and scorned as the 'telescopic theory'. While Kripke proposed the soft realism in respect to Aristotle's logic, and the possible worlds were understood as Aristotle's '*potentia*', and in Aristotle's logic the predicate is actually assigned as ontological. Therefore, his logic in effect focuses on the predicate. Now that Kripke is in line with the ontological position of the predicate, he is sure to be in favor of Aristotle's 'potential infinity' rather than the 'actual infinity' in the classic logic. Kripke's interpretation eliminates the possible worlds in reality, which is understood as 'possible states' of affairs.. It should be pointed out that these two interpretations were entirely given in the framework of the western philosophy so as to approach Leibniz's philosophy too narrowly to encompass his profoundness.

The Russell-Couturat line of interpretation shows the splendor of the western scholarship, however, it also has a fatal shortcoming that it regarded Leibniz's lifelong connection with China as peripheral to his main philosophical concerns. And it seems that the Anglo-American philosophers often overlook this historical link. However, I would argue that his China connection is still influential in this line of argument for Leibniz is not only as a philosopher but also viewed as a proto-Sinologist. It seems that he is an 'alternative' in the history of western philosophy for he introduced an oriental organic and naturalistic worldview especially in his doctrine of possible worlds. David E. Mungello gave out a sound study on this respect. And Joseph Needham's also wrote a special section of *Zhu Xi, Leibniz and the Organic Philosophy*, where he pointed out that the Chinese thoughts generalized in *lixue* (lit. studies of reasons and principles, or just Neo-Confucianism as Derk Bodde rendered) contributes to the European thoughts much larger than they have been acknowledged. And the whole significance in philosophy has not been apprehended as yet.

Now we are going to open an organic naturalistic approach to comprehend Leibniz's theory of possible worlds from an oriental perspective. I think that possible worlds could be viewed as worlds in information. This would be an interpretation of modal theory of information or modal informationalism. According to Leibniz's idea, the number of possible worlds is infinite, then we would apply the notion of actual infinity into the possible worlds, i.e., the 'abstraction of actual infinity' employed in single-world assumption is generalized into the multiple worlds assumption. The notion of infinity is no longer seen as an infinite extending process, as it were, rather it is seen as a finished totality, or just 'allatonce-ness'. In this way, 'infinite' would be seen as 'finite'; alternatively we could treat the 'infinite problems' with 'finite methods'. As far as the human beings do not have a position of God, we don't have God's eye to view all of the details at one time. Therefore, the axiomatic method could only be confined to a certain model. Models are artifacts by which we could investigate those objects essentially non-constructive. Conversely, we would be able to have an infinite possibility in constructive capability. It is necessary to point out that our modal informationalism is different from the classic logic, in which other three principles of nonempty of individual domains, two-valued and extensional are not necessary and sufficient conditions. This is because the possible worlds in our horizon no longer limited in the physical or 'natural' world, on the contrary they are

informational and metaphysical worlds. And this could ensure the plurality of subjects and analyticity of all propositions. This is coincident with Leibniz's subject-predicate logic from where his metaphysics is derived, i.e., subject is in the possible world and predicate in the actual world.