Hao Wang's Philosophical Contributions

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Honoring the Centennial of Hao Wang's Birth
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Wang's Biography 1921-1995:
(Parsons, JSL 2,1 1996: 108-111)

Part I: Student Days

- 1921 Born in Jinan, Shandong 5/20/21

- 1939-1946 Kunming, National Southwest Associated University (published on the New Lixue 1944; language and metaphysics 1945, scepticism and induction 1947)

- 1943 B.Sc. in Mathematics, National Southwest Associated University

- 1945 M.A. Philosophy, Qinghua University

- 1946 To Harvard University, studies Logic and Philosophy

- 1948 Ph.D. Harvard University

- 1948-1951 Jr. Fellow, Society of Fellows, Harvard University (with Bernays in Zürich 1950-51)

Wang's Biography 1921-1995:
(Parsons, JSL 2,1 1996: 108-111)

Part II: Professional Career

- 1953-54 Burroughs Corporation
- 1954-55 On Leave Abroad; John Locke Lecture Oxford 1955
- 1956-61 Reader, Philosophy of Mathematics, Oxford
- 1961 Gordon McKay Professor of Mathematical Logic and Applied Mathematics, Harvard
- 1967 Professor, Rockefeller University
- 1971-2, 1975-6 Conversations with Gödel (*From Mathematics to Philosophy* 1974; "Sets and Concepts" 1975 ed. Parsons)
- 1985 Honorary Professor, Peking University
- 1986 Honorary Professor, Qinghua University

Notable Philosophical, Logical and Historical Works: (Full Bibliography *Phil. Mathematica* Feb. 6,1 1998)

- 1961, "Process and existence in mathematics"
- 1962 *A Survey of Mathematical Logic* (Peking/Amsterdam)
- 1974 *From Mathematics to Philosophy*
- 1981 *Popular Lectures on Mathematical Logic* (Beijing/New York)
- 1985 *Beyond Analytic Philosophy: Doing Justice to What We Know*
- 1987 *Reflections on Kurt Gödel*
- 1996 *A Logical Journey: From Gödel to Philosophy*

Parsons: Wang's Contributions to Mathematical Logic

1. 1950 Repair Quine's system NF *Mathematical Logic* shown inconsistent by Rosser in 1940: add sets, give a model-theoretic proof of the consistency of the system relative to NF.

2. 1954 Predicative Foundation of Mathematics: Construct a transfinite sequence of ramified systems indexed by ordinals (autonomous iteration). Weyl's ideas; contemporaneous with Lorenzen and others.

3. 1960 Automated theorem proving (IBM): all theorems of propositional logic in *Principia* in a few minutes, most of the theorems of predicate logic. Milestone Award for Automated Theorem Proving (1983).

4. 1961 with Kahr and Moore: the AEA case of the decision problem for first-order logic is unsolvable. Connection with Tiling Problems (Wang, "Notes on a class of tiling problems", *Fundamenta Mathematicae* 82: 295-305).

Parsons and Link, eds. 2011
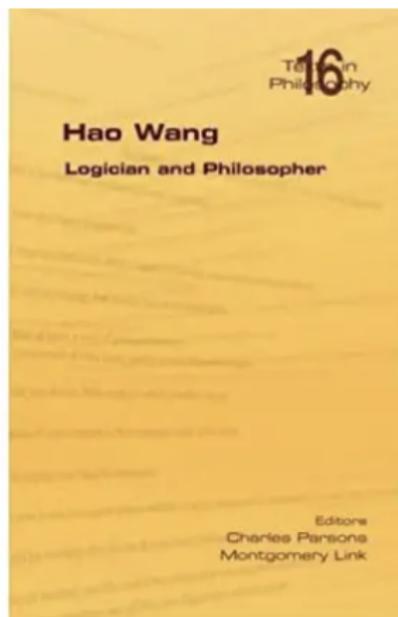
Parsons and Link, eds. 2011

- Parsons, "Hao Wang"
- Hao Wang's Chinese writings (Jandovitz and Link, trans.)
  1. Memories related to Professor Jin Yuelin (Wang)
  2. From Kunming to New York
- Remembering Wang Hao, He Zhaowu
- Collaborating with Hao Wang on Gödel's Philosophy (E. Köhler)
- Hao Wang's contributions to mechanized deduction and to the *Entscheidungsproblem* (M. Davis)
- Sets and concepts, on the basis of discussions with Gödel (Wang, ed. Parsons)
- Hao Wang on the cultivation and methodology of philosophy (A. Shimony)
- Wang and Wittgenstein (J. Floyd)
- Bibliography of Hao Wang (also in *Philosophia Mathematica* 3,6 1998: 25-38).

An Envisioned Trilogy

In general, Wang seems to have considered philosophy the most central and significant subject.

1. *Beyond Analytic Philosophy* (1985)

2. *Reflections on Kurt Gödel* (1987)

3. Gödel and Wittgenstein as exemplars of a "quest for purity" (unfinished; but see 1991 paper "To and From Philosophy – Discussions with Gödel and Wittgenstein" (*Synthèse* 88 1991: 229-277)

Wang and Wittgenstein

- 1st Engagement 1953-1958 (*Philosophical Investigations* 1953; *Remarks on the Foundations of Mathematics* 1956).

- 2nd Engagement 1981-1995.

- Closes final chapter of *A Logical Journal: From Gödel to Philosophy* (1996).

- Engaged with Wittgenstein before and after his personal engagement with Gödel.

Wang and Wittgenstein

- Opinionated, appropriative readings (as with Gödel).
- Took Wittgenstein much more seriously philosophically than did Kreisel, Bernays or Gödel.
    - Kreisel: "[RFM] the surprisingly insignificant product of a sparkling mind".
    - Bernays: [RFM] expresses an irrationalism, nihilism or aborted phenomenology.
    - Gödel: Clearly W. failed to understand my incompleteness theorem.
- Emphasized W's interest in "factualism", non-reductionism, surveyability *Übersichtlichkeit*, dialectical/literary conveying of philosophy, but not scepticism about rule-following (like Kripke, Cavell).

Wang and Wittgenstein

Wang wished to avoid the label "Wittgensteinian" (like Rawls).

- In his "Process and Existence" he never mentions W's name once, though obviously the piece grows from a reading of RFM.

- His readings of W are distinctive and independent, very different from e.g. Dummett or Malcolm or "linguifying" readers (like Carnap).

- W's philosophy needs (like Gödel's) reformulation in light of alternatives, Wang will pick and choose what seems right to him.

- Wang is seeking a synoptic view of knowledge ("factualism"), of Gödel, and of Wittgenstein through a process of comparison and investigation.

Wang and Wittgenstein

- Wang especially liked Wittgenstein's anti-empiricism and anti-reductive conceptual pluralism.

- He also embraced the ideal of agreement (*Übereinstimmung* in judgments (consensus?))

- Wang did not see ordinary, everyday language offering an ultimate subject of theorizing or a constraint on speculation, but rather a touchstone for reflection.

- Wittgenstein's resistance to reducing philosophy and logic to formal methods was welcomed by Wang (knowing how vs. knowing that, practice vs. theory?)

- Wang was very critical of Wittgenstein's hostility to certain kinds of popular science (Jeans).

Wang and the History of Philosophy

A Logical Journey begins with two quotations:

- Ren tong ci xin, xin tong ci li. There are sages from the East; there are sages from the West: all of them have the same kind of mind-heart; all their minds have the same kind of intuition. (Lu Jiuyuang, 1139–1193)

- It is only after profounder acquaintance with the other sciences that logic ceases to be for subjective spirit a merely abstract universal and reveals itself as the universal which embraces within itself the wealth of the particular (Hegel, *Greater Logic*)

"Factualism"

- Begin with "gross" facts, then explore. A piecemeal or "criss-crossing" method?

- Do not question views from purely philosophical arguments in developing/presenting your own.

- Influence of the *Tractatus*, Later Wittgenstein on Wang? – "Forms of Life" vs. "Language-Games"

- Later on Wang embraced Rawls's method of "reflective equilibrium" ("perspicuous objectivity").

"Intuition"

- There is a capacity for intuitive receptivity that mathematics brings out.

- It is particular and involves ways of seeing things (Floyd: "aspect realism" and W (*Cambridge Element*).

- It is not wholly and necessarily unconceptualized (as in Kant), but allows for conceptualization to proceed.

- A dialectic between the formal and the intuitive.

"Conceptualism"

- Indebted to Dedekind and Gödel
- But like Wittgenstein, dynamic and amorphousness to notion of a *concept*.
- The very idea of conceptual knowledge implies a contrast and a connection with technical or combinatorial skill.
- "Connectivism" rather than "Conceptualism" (1991?), a Wittgensteinian sounding revision?

Is the Mind Mechanizeable? *Are* We Machines?

- Here Wang took Gödel very seriously; treated these questions as fully meaningful.

- Wang imbibed Gödel's misreading of Turing: (Floyd 2017f. Turing was no mechanist about the mind).

- Wang used his understanding of the complexity of "What is a Machine?" to shed light on these questions.

Parsons 1996, JSL Memoriam

[Wang's] writings on Gödel attempt to capture Gödel's whole intellectual personality. Although he recognized that Gödel's aspirations as a systematic philosopher were only very partially fulfilled, he nonetheless took them seriously, even when the views Godel expressed were alien to him. No one else has tried so hard to see Godel whole. But the spectacles with which he saw were very much his own. In particular, his exchanges with Gödel were conversations between two thinkers with synoptic ambitions, one of whom sought resources from earlier Western traditions, and the other of whom, however Western his training and career, never ceased to be Chinese.