# A Chronology of Wang’s Logical Journey

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| Wang Hao’s Early Life in China | | | Context |
| 1921 | May 20 | Born Wang Hao, 王浩 to a family of intellectuals in Jinan, Shandong Province, China. Wang learned from his parents both Chinese tradition and modern European-American approaches to science, art, and politics brought about by Sun Yat-sen’s Revolution of (1911–12) that overthrew the Qing (or Manchu) dynasty and created the Republic of China.  Wang grew up during the “Post-May Fourth Movement in China.” (Wang’s phrase in [1993]), which arose from disillusionment with the Chinese Republic and traditional Chinese culture to protect China from imperialism. | The May Fourth Movement (1919) anti-imperialist movement grows out of student protests in Beijing against China’s treatment in the Treat of Versailles. In 1925 the Kuomintang party (KMT) is formed and engages in a civil war against the insurgent Chinese Communist Party.  The legacy of the 1882 Chinese Exclusion Act, the first immigration law in U.S. history to target a group by race and class for exclusion, is extended to discriminatory naturalization laws, e.g., the *Cable Act* (1922) which stripped American women of citizenship if they married a Chinese noncitizen, an “alien ineligible to citizenship.” |
| 1936 |  | Wang and He Zhaowu were classmates at the National Southwest Associated University in Kunming, a wartime combination of Peking, Tsinghua, and Nankai Universities.  An *annus mirabilis* for logic: Church’s Theorem, Turing’s Unsolvability of the Halting Problem, Church-Turing Thesis, Tarski’s Undefinability Theorem, Gentzen’s Consistency Proof for Arithmetic, etc. | During the War of Resistance the KMT and the Communists make peace to form a united front against Imperial Japan, 1937-1945.  Franklin D. Roosevelt’s *Lend Lease Program* (March 1941) allows him to “… lease, lend,” or invest in countries “deemed vital to the defense of the United States”, *e.g*., China ($1.6 billion) and Great Britain ($31.4 billion). |
| 1941 |  | Hao 1 9 (1).jpegWang marries Yenking (Sophie), with whom he had three children: San-You (became a doctor/research scientist), Yi-Ming (became an astro-physicist) and Hasiao-Ching (Jane) (became a jazz musician). | In 1941, China officially joined the Allies in World War II.  On Dec. 7, 1941, Japan attacks the U.S. at Pearl Harbor and the following day the U.S. declares war in Japan. |
| 1943 |  | Wang earns B.Sc. in Mathematics.  Hao’s graduation with M.A. in Philosophy from Tsinghau University, 1945 | In 1943 close to 30 million people were dying of starvation in China.  On February 19, 1942 Executive Order 9066 authorizes with a trial or any evidence the forced relocation and incarceration of between 110,000 - 120,000 persons of Japanese descent living, about two-thirds of whom were American citizens, into ten internment camps in desolate parts of the U.S. The Magnuson Act (1943) “repeals” the 1882 Chinese Exclusion; however, the “repeal” raised the quota of 100 to 105 Chinese per year from anywhere in the world compared with a yearly quota of 65,721 from Great Britain and Northern Ireland. |
| 1945 |  | Earns M.A. in Philosophy from Tsinghua University. Wang’s philosophical essay “Language and Metaphysics” (Chinese), was later published in English translation in the *Philosophical Review* (1946). | U.S. dropped atomic bombs on Hiroshima (Aug. 6th) and Nagasaki (Aug. 9th) resulting in the death of 129,000 civilians, the only use of nuclear weapons in the warfare history of the world. Japan’s surrendered on August 15th. |
| * Journeying from China to America | | | |
| 1946 |  | At the age of 25, leaves China on the U.S. Government State Department scholarship to study abroad at Harvard. | The ENIAC (“Electronic Numerical Integrator and Computer”) is unveiled at the University of Pennsylvania |
| 1947 |  | Publishes “Notes on the justification of induction” in *The Journal of Philosophy*,  “A note on Quine’s principles of quanti-fication" in the *Journal of Symbolic Logic****.*** | Beginning of “Red Scare” and the Blacklisting of Hollywood actors who refused to testify to House Un-American Activities Committee |
| 1948 |  | Becomes Quine’s fifth Ph.D. student by completing his thesis *An Economical Ontology for Classical Arithmetic* in one year and eight months, becomes a Harvard Junior Fellow (1948-1951), begins research into computatability. | On October 1, 1949, Mao Zedong declares the existence of the *People’s Republic of China* (PRC); the Nationalist Kuomintang (KMT) is confined to Taiwan. |
| 1950 |  | Repairs Quine’s first edition of *Mathematical Logic* [1940], which was shown inconsistent 1941 by Rosser and independently by Lyndon.  Peking University Chancellor Ma Yinchu offers Wang a teaching position in China, an opportunity that ended when the Cultural Revolution made it impossible to return. | U.S. experiences post-World War II economic boom; McCarthyism creates a climate of anti-Communism.  Soviet Union under influence of Marxism denounces mathematical logic *“as a conceptual game of capitalist class idealism”* [He [1995] in Parsons and Link [2011], 50]. |
| * Journeying to Switzerland; | | | |
| 1950 – 1951 | | Studies *predicative mathematics* in Zurich under the auspices of Paul Bernays. | U.S. enters into the Korean War (1950 -53), the next war in Asian. |
| 1951 | | Becomes Assistant Professor at Harvard.  Wang’s repair of Quine’s *Mathematical Logic* is published in the second edition [1951]. | 1952 McCarran-Walter Act abolishes racial and ethnic limitations naturalization while retaining a race-based National Origins Quota System and created an Asia-Pacific restrictive zone to limit immigration. |
| 1953 – 1954 | | During his tenure at Harvard, Wang was ahead of his time in partnering with the emerging computer industry, e.g., *Burroughs Corporation*, IBM, Bell Laboratories. |
| * Interlude in Oxford | | |  |
| 1954 - 1955 | | Journeys from Harvard to Oxford, where he is the second philosopher to deliver the John Locke Lectures. Wang’s topic is “On Formalizing Mathematical Concepts.” | January 7, the Georgetown-IBM experiment automatically translates 60 Russian sentences into English.  U.S. begins involvement in Vietnam. |
| 1956 |  | Becomes Reader in the Philosophy of Mathematics at Oxford University | The U. S. *Chinese Confession Program* (1956 – 1965) launched by the Immigration and Naturalization Service cracks down on Chinese immigrants and pressures Chinese Americans who are in America illegally to confess to be eligible for leniency.  In 1959, Alaska becomes (Jan. 3) the 49th and Hawaii the 50th state. (Aug. 21)  March 24, *Texas Instruments* introduces the solid integrated circuit or microchip. |
| 1957 | Aug. 24 | Jane Wang (*Hsiaoching*) is born in Oxford to Hao Wang and his first wife Yenking Wang. |
| * Returning to America | | |
| 1959 |  | Wang programs the IBM 704 computer to prove all the propositional theorems, and most the predicate logic theorems of *Principia Mathematica* in less than nine minutes, showing its *“essential lack of conceptual richness.”* |
| 1961 |  | Wang returns to Harvard as the *Gordon McKay Professor of Mathematical Logic and Applied Mathematics*; publishes research on Wang Tiles. | President John F. Kennedy addresses Congress on May 25, 1961 to set the goal *“of landing a man on the Moon and returning him safely to the earth”* within a decade. |
| 1962 |  | Wang proves in collaboration with Andrew S. Kahr and E. F. Moore that the ∀∃∀ case of the decision problem for first-order logic is unsolvable.  *A Survey of Mathematical Logic* (Peking: Science Press; Amsterdam: North-Holland) published first in Chinese and then in English (1963). | President Kennedy is assassinated on November 22, 1963.  The Hart-Celler Act (1965) abolishes the national origins quota system that had structured American immigration policy since the 1920s, ending the century long policy of legalized discriminatory immigration laws directed against the Chinese and extended to other nations of Asia.  1966 President Lyndon Johnson escalates the War in Vietnam. |
| 1966 |  | Wang begins to focus mainly on philosophy.  Wang’s student Robert Berger shows that Wang’s conjecture that Wang Tiles would not allow aperiodic tilings is false and that the *Undecidability of the Tiling Problem* . |
| * Journeying from Boston to New York | | | |
| 1967 |  | An *annus mirabilis* for Wang, who becomes an American citizen, and leaves Harvard for Rockefeller University to become a Professor of Logic, where Wang is granted funds to establish his logic research group.  Begins his correspondence with Gödel.  Wang’s journey from Boston to New York is not only active professionally but also coincides with personal changes and transitions. | The Cultural Revolution in China (1966 – 1976) brings about the public persecution of intellectuals.  On October 21, 1967, one of the most prominent anti-war demonstrations took place as some 100,000 protesters gathered at the Lincoln Memorial with about 30,000 continuing on to protest at the Pentagon.  Student protests at San Francisco State University and U.C. Berkeley in 1968–69 established ethnic studies, launching the Asian American Movement. |
| 1971 | Oct. | Begins a series of weekly conversations with Gödel at the IAS at Princeton. |
| * Journeying Back to China | | |  |
| 1972 | Summer | Wang, 26 years after leaving China, returns as a member of first delegation of Chinese American scientists to visit the PRC. Wang immerses himself in Maoism and Marxism, an *“infatuation … that lasted about 7 years”,* and reawakens his desire for *“a comprehensive philosophy unifying thought and action.”* | From February 21–28, President Nixon’s visited the People’s Republic of China, an important step in formally normalizing relations between the U.S. and the PRC after a separation of 25 years. Nixon’s rationale is for the U.S. to gain more leverage against Soviet Union and to resolve the Vietnam War. |
| 1974 |  | Publishes *From Mathematics to Philosophy* | On August 8th, after the Watergate scandal, President Nixon announces his resignation. |
| 1975 |  | Dummett makes “Wang’s Paradox” or the “Paradox of Small Numbers” famous. | U.S. pulls out of the “quagmire” of Vietnam, with Nixon declaring “Peace with Victory.” |
| 1976 |  | Wang’s logic research group is disbanded after which Wang remained alone. | September 9, 1976 Mao Zedong dies, the Gang of Four is charged with treason. |
| 1980 |  | Wang visits classmate He Zhaowu in Kunming, and Zhaowe visits Hao in New York. Wang laments: “*I remember the pain the bitterness I suffered at the time because of the wrenching transformation of my thinking and the lost of my convictions.”* | GPS time epoch begins. Microsoft creates an operating system for the IBM personal computer. Deng Xiaoping introduces market reforms and allows hundreds of thousands of Chinese students to study in America and Europe. |
| 1981 |  | Publishes *Popular Lectures on Mathematical Logic,* based on his lectures in China. | IBM introduces the IBM PC, the first personal computer which uses MS-DOS. |
| * Honored as a Computer Scientist in America; Honorary Professorships in China | | | |
| 1983 |  | Awarded (the first) Milestone Prize for automated theorem proving by the International Joint Conference on Artificial Intelligence. | *U.S.-China Conference on Science Policy* in Washington, D.C. brings together the National Academy of Science and the Chinese Academy of Science*.* |
| 1984 |  | He stays with Wang in New York for the most of the year having “joyous get-togethers” while Wang completes *Beyond Analytic Philosophy.* | September 26, the Sino-British Joint Declaration on the Question of Hong Kong agrees the Chins will “resume sovereignty” over Hong Kong in 1997. |
| 1985 |  | Publishes *Beyond Analytic Philosophy: Doing Justice to What We Know* with MIT Press. | Awarded Honorary Professorships at Peking University and Tsinghua Universities. |
| 1986 | August | Invited as the main speaker of the *11th Annual Wittgenstein Symposium* in Kirchberg Amwechsel speaking on “Gödel and Wittgenstein.”; Wang becomes the founding president of Vienna’s *Kurt Gödel Society*. | On January 28 Space Shuttle Challenger disaster happens.  IBM unveils PC Convertible, the first laptop computer. LISTSERV, the first email list management software, is developed. |
| 1987 |  | Publishes *Reflections on Kurt Gödel* (Cambridge, Mass.: MIT Press) | Black Monday (10/19), the worldwide stock market crash begins in Hong Kong. |
| 1988 |  | Met Hanne Tierney through the “Reality Club” in New York, an accomplished group of artists, academics, and other accomplished individuals. | The Tiananmen Square protests (1989) known as the June Fourth Incident (六四事件) or '89 Democracy Movement (八九民运) in China.  Hao 1 2.jpeg  Hao and Hanne visit China 1992  The 1997 transfer of sovereignty over Hong Kong from the United Kingdom to China. |
| 1989 | June 4th | Wang ”tore up his invitation” to return to China after Tiananmen Square resigning himself to living in the west, intensifies Gödel studies ([Köhler [2011], 58) |
| 1990 |  | *Computation, Logic, Philosophy. A Collection of Essays* first published in Beijing and then by Dordrecht: Kluwer Academic. |
| 1991-1994 | | Juliet Floyd begins meetings with Hao Wang and his wife artist Hanne Tierney. Hanne encourages Hao to reconcile with his first wife and children. |
| 1995 | May 13 | Wang dies one week before his 74th birthday. |
| 1997 |  | *A Logical Journey: From Gödel to Philosophy,* completed months before Wang’s death, is published posthumously. |
| Honored Artistically and Academically in America | | | |
| 2001 | Oct 11th -  Nov 10th | Hanne Tierney in collaboration with Wang’s daughter Jane Wang create and perform “How Wang-Fo Was Saved.” | Hao 1 6 (1).jpeg  Hao Wang (王浩 *Wáng Hào*)  1921 – 1995 |
| 2011 |  | Publication of the memorial volume *Hao Wang: Logician and Philosopher*, eds. Charles Parsons, Montgomery Link. |