

On Leibniz and the I Ching

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“I don’t believe in I Ching.”

—JOHN WINSTON ONO LENNON (1940-1980)

Gottfried Wilhelm Leibniz (1646-1716), perhaps best known as the coinventor of calculus, philosophy, history, and numerous other fields, have led some to label him as a “universal genius.”¹ His accomplishments are even more astounding when one considers that he achieved most of his mathematical and philosophical breakthroughs in his spare time, as he was legal counselor by profession. But one particularly curious fact about this man is that he was perhaps one of the first European *sinophiles* (lovers of Chinese culture). For whatever reason, however, his interest in all things Chinese, was barely touched upon by many of his biographers and even those who specifically documented his philosophical influences.² In fact many people are quite surprised to hear that Leibniz expressed interests in the orient, so it is only natural to ask why Leibniz was so interested in China. In particular, Leibniz was interested in the Chinese system of writing, which being an ideographic system, is quite different from the phonetic Roman alphabet used in the English, German, French, etc. Furthermore, Leibniz was particularly interested in a series of hexagrams found in the *I Ching* or *Yi Jing* (c. 1150 BCE) which expressed numbers in what appeared to be binary form.³ Leibniz, who was developing his own system of binary numbers at the time, was particularly fascinated that the Chinese supposedly had developed a concept of these numbers thousands of years earlier. This paper will investigate, albeit in brief, Leibniz’ interests in the Chinese, and in particular the nature of this ancient binary system found in the I Ching hexagrams.

Many European thinkers during the 17th and 18th centuries expressed an uncanny enthusiasm for any information concerning the culture and practices of the Americas, Africa, Persia, India, and China. Western merchants, diplomats, missionaries, and travelers were often asked for accounts of their travels, and these accounts, whether true or false, were often exciting to Westerners, who were in want of something to exercise their imaginations with.⁴ However, as tempting as it may be to write off the interests of a polymath as nothing more than a general romanticized curiosity shared by his contemporaries, Leibniz’ interests in Chinese culture, can be explained by a more careful examination of his philosophical ideas and areas of interests. After hearing of a theory expounded by the Dutch orientalist, Jacob Gohl, which postulated that the Chinese language had been created to establish verbal communication between a large number of diverse nations, Leibniz sought to investigate whether or not the Chinese written language could be employed as a universal language. Leibniz desired a system of communication which would allow philosophers from around the world to communicate abstract ideas with precision and accuracy, without the interference of cultural and linguistic differences; an ideographic system of writing seemed most likely to suit such needs. As it turns out, Leibniz was not satisfied with the Chinese system of writing for this purpose, as he found that Chinese characters were “apparently content in [giving] several connotations.”² Nevertheless, this was not a setback which deterred Leibniz from further investigating elements of Chinese culture, especially as he was beginning to appreciate Confucian philosophy, and interpreting ancient Chinese beliefs which are now seen as agnostic as monotheistic.⁵ More

recent scholarship on Leibniz, however, also suggest that Leibniz may have had one of several, although not necessarily mutually exclusive reasons, for his interest in Chinese culture. Even though he was often classified as a rationalist, Leibniz may have had more practical motivations. Moreover, perhaps Leibniz' investigations of logic were motivated by practical and theological concerns with the cultural exchange of information. Lastly, some scholars point to the likely possibility that Leibniz was a *pluralistic* thinker, wanting to bring different schools of thoughts and cultural ideas together.⁶ Finally, it should be added that Leibniz' ideas and conceptions of China were formed by a 17th century European view of China, even if the most optimistic and enthusiastic one possible. Indeed, all of Leibniz' understanding of China came from a small group of Jesuit missionaries in China which he was in continual communication with, and also a few Chinese texts, translated by Jesuits.⁶ Whatever the case may have been, Leibniz' sinophilia certainly stems from a variety of factors, not the least of which were his particular philosophical motivations.

One revelation about the Chinese which particularly caught Leibniz' attention came in 1700 when the Jesuit Joachim Bouvet brought ancient Chinese diagrams depicting what appeared to be some vital lost philosophy to the attention of Leibniz; these were the I Ching hexagrams which included solid and broken lines with progressed in a sequence that was unmistakably binary. In fact, Leibniz had been developing such a system after he expressed a keen interest in non-decimal number bases some time earlier.⁷ The immediate appeal of this system to Leibniz was not out of pure mathematical interest alone, indeed the diagrams only served to reaffirm for Leibniz that a system of "ones" and "zeros" capable of expressing any possible value only served to show how God could create the universe from "unity" and "nothingness."⁶ Furthermore, Leibniz, already well versed in sinology, understood that the symbols represented the duality between yin and yang, proving (to Leibniz) that the ancient Chinese had a similar notion of God and a universal number system. Above all, it appears that Leibniz had something of an agenda, when it came to trying to fit the sum of all of human inquiry across all cultures into his own metaphysical world view.⁸ However, the question remains as to whether the ancient Chinese really understood the progression of binary numbers, and if so, did they understand how to carry arithmetic or logical operations on such numbers? There can be little doubt that they, at the very least, understood that these symbols followed a clear pattern, but whether or not they ever made the connection between such an organized progression of symbols and their use in expressing quantities in the same fashion of conventional numbers remains an open question. In any case, Leibniz had indeed conjectured further that the ancient Chinese had understood binary arithmetic, and perhaps even had a concept of applying binary arithmetic to the proving of logical propositions (a concept akin to modern Boolean algebra). Although some researchers claim that the Chinese did possess a deep understanding of logical formalism,³ the majority of contemporary scholarship feels that Leibniz overestimated Chinese knowledge regarding formal logic and binary arithmetic.⁸ Still many scholars are unsatisfied with the lack of certainty regarding ancient Chinese understanding of the binary number system, but lack of any other evidence of their use of binary numbers (the I Ching is an isolated case), seems to imply that they didn't understand the significance of these numbers in the same sense that Leibniz did. Whatever the case may have been regarding the veracity of Leibniz' presumptions regarding the extent of ancient Chinese knowledge, this episode only serves as a further example of why Leibniz was so interested in the Chinese: he perceived the philosophical ideas of the Chinese as being in line with his own metaphysical world view.

As it turns out, Leibniz was probably wrong in regards to the Chinese, but he could not have been more right in regards to understanding that the duality of "ones" and "zeros" was a vital step in expressing logical formalism, and in his search, Leibniz practically laid out the path for the coming digital age and modern computing as we know it today. Perhaps Leibniz would consider our computers as being a step closer to the universal language he sought throughout his life. After all, this paper was created using "ones" and "zeros."

References

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