

Public Principle, Times and Cross-Border Knowledge

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Abstract This article focuses on the paradigm shift that took place in Chinese thought during the nineteenth and twentieth century after the contact with Western scientific thought. The author moves from the role of Pacioli and the introduction of double-entry bookkeeping on Italian Renaissance and Western culture to the reconstruction of the various fields of knowledge in China after the replacement of the heavenly principle (*tianli* 天理), based on Confucianism and its values, with the new general principle (*gongli* 公理) based on modern science, which provided the base for a new social model and a new principle of morality.

Keywords Chinese intellectual history. Scientific thought. Epistemology.

Venice, for me, is more than music. In preparation for the trip to Italy, where I was to be awarded the Luca Pacioli Prize (20 October 2013), and for the long flight across the continent, I picked up from my bookshelf *Leonardo da Vinci: The Flights of the Mind*, written by the British biographer Charles Nicholl (2005). My curiosity was first aroused by Luca Pacioli (1445-1517), after whom the award is named, one of the greatest men of the Renaissance, friend of Leonardo da Vinci and Father of Accounting. Curious about this brilliant mathematician, I started to read da Vinci's biography for some clues about him. As expected, Luca Pacioli shows his presence in Chapter 5, *The Making of the Last Supper*. In the dedication of his newly completed work *Divina Proportione*, dated 14 December 1498, Luca the 'Magister' (Master), as he was respectfully called by da Vinci, wrote:

One cannot imagine a keener attentiveness in the apostles at the sound of the voice of ineffable truth which says, 'Unusvstrum me traditurus est.' Through their deeds and gestures, they seem to be speaking among themselves, one man to another and he to yet another, afflicted with a keen sense of wonder. Thus worthily our Leonardo created it with his delicate hand. (Nicholl 1995, p. 195)

«The dramatic moment», as Pacioli commented, is the synthesis of two separate scenes: one is Matthew 26:21-2 when Jesus says to his disciples,

«that one of you shall betray me»;¹ the other is the more conventional depiction centered on the Eucharist handed down from the Middle Ages. Not surprisingly, the traditional linear grouping of the disciples placed along the table is broken, with da Vinci bringing these figures with a quality of 'attentiveness' and 'wonder' into the scene of the Eucharist. In «this restless masterpiece», as Burckhardt (1818-1897) called it, the central figures of Christ, the apostles, and the betrayer, are placed in the scene in a rhythmic pattern called «a kind of wave-formation» and compared to an optical diagram by later commentators (Pietro Marani). And, «an eerie moment of precision – a small hole was punched in the center of the picture: the vanishing-point. It is a point on the right temple of Christ (Nicholl 1995, p. 196)». The atmosphere of 'attentiveness' and 'wonder' are produced by precision and accuracy. It is the same precision, and its connection with artistic creation that is reflected in the friendship (and relationship) between da Vinci and Pacioli. In 1494 Pacioli published his epochal work *The Sum of Knowledge Concerning Arithmetic, Geometry, Proportion and Proportionality* (*Summa de Arithmetica, Geometria, Proportioni et Proportionalita*). Da Vinci not only purchased the book and took notes on it, but it is said that some of these notes are closely related to the making of *Last Supper*. In the preface to *Divina Proportione*, written during his Milan period, Pacioli acknowledges that all the illustrations are elaborated by «the most excellent painter in perspective, architect, musician, the man endowed with all virtues, Leonardo da Vinci of Florence».

Both da Vinci and Pacioli can be regarded as the '*homo universalis*' unique to the Renaissance era of Italy. In their respective realms, we can find distinct convergences: mathematics, art and religion. Mathematics – the cosmic axiom – takes the ontological (ultimately original) site, whether in the interpretation of religious scenes or the arrangement of secular life. Before Pacioli's great works were produced, the ideas and practices of double-entry bookkeeping had already developed, particularly in Florence, Genoa, and Venice, as a result of commercial growth and trade. Nonetheless, *The Sum of Knowledge* systematized double-entry bookkeeping and made it widely circulated and implemented common knowledge in the following centuries. According to Werner Sombart, double-entry bookkeeping was born from the same spirit as the systems of Galileo and Newton and he thought that «capitalism and double entry bookkeeping are absolutely indivisible; their relationship to each other is that of form to content (Sombart 1992, p. 23)». In his hometown (Borgo Santo Sepolcro), the epigraph for him says «he established the system of double-entry bookkeeping and his mathematical work later became the immutable foundation of future thinking».

1 Matthew 26:21 «And as they did eat, he said, Verily I say unto you, that one of you shall betray me»; 26:22 «And they were exceeding sorrowful, and began everyone of them to say unto him, is it I?»

Such foundational knowledge in Pacioli and da Vinci's work transcends the realms of secular and sacred, art and science, even as it unites the exploration of nature and utilitarian planning. In their worlds, art, religion, market activities and scientific research freely diverge and converge and then diverge again, like a surging river. In formal terms, these axioms are directly embodied as the application and deduction of certain mathematical formulae; in fact, however, be it the theory of bookkeeping, or the moment of the flowering of artistic creation, they emerge from innumerable possibilities, through rigorous investigation and experiment, and the engagement with and departures from tradition.

Accepted principles, then, are always associated with the moment of creation, and with the propensities of the times. Mencius praised Confucius saying:

孔子，聖之時者也。孔子之謂集大成，集大成也者，金聲而玉振之也，金聲也者，始條理也。玉振之也者，終條理也，始條理者，智之事也，終條理者，聖之事也。Confucius was the timely one. In Confucius we have what is called a complete concert. A complete concert is when the large bell proclaims the commencement of the music, and the ringing stone proclaims its close. The metal sound commences the blended harmony of all the instruments, and the winding up with the stone terminates the blended harmony. The commencing of that harmony is the work of wisdom. The terminating it is the work of sageliness. (Legge 1970, p. 372)

Confucius looked up to the ancient Sages, perceived the propensity of the times and manifested the spirit of the universal from the particulars of circumstance and conduct. Just as with the beginnings of ancient music, the sounds of metal and the ringing stone are blended into harmony with orderliness all along, which originates from the wisdom of individual insight and concludes with the power of sagely practice. Here, the relationship between start and finish is dialectical. 'A complete concert' (or grand synthesis) is far from being a mere collection of all the historical relics of the Sages. Rather, it is always the moment of creation via 'a delicate hand', the skill of which rivals nature. Is not the universal order that is embodied in the practice of the Sages, the beginning of understanding and insight? However, both understanding and insight are not confined to subjective activity but are rather to unfold the order of things through such activity. According to Shao Yong 邵雍 (1011-1077), a Neo-Confucian of the Northern Song Dynasty (eleventh century CE):

夫所以謂之觀物者，非以目觀之也。非觀之以目，而觀之以心也，非觀之以心，而觀之以理也。... 聖人之所以能一萬物之情者，謂其聖人之能反觀也。所以謂之反觀者，不以我觀物也。不以我觀物者，以物觀物之謂也。

Observing things is not to observe via the eyes. Not with the eyes, but

to observe via the mind. Not with the mind, but to observe via principle (*li* 理) [...] The reason that Sages are capable of unifying the feelings of the myriad things is because of their reflective perception. Reflective reflection means not to observe things from 'I'. Not to observe things from 'I', but to observe things from things. (Shao 1992, pp. 23-24)

It is to let the order of things demonstrate itself naturally. And in pursuit of this, a practice is required, consisting of the wisdom of insight and the unity of knowledge and action, based on the unity of mind and things. Meanwhile, the order of things and 'I' are united as one, in which the moment of creation comes into being.

This pursuit of universality is also directly demonstrated in modern thought and its schematization of knowledge. During the late nineteenth and the early twentieth century, almost all fields of knowledge in China were reconstructed when confronted with Western thought. I have summed up this process of reconstruction as the replacement of the heavenly principle (*tianli* 天理), based on Confucianism and its values, by the new general principle (*gongli* 公理) based on modern science.

Nonetheless, the fall of the view of the world based on the heavenly principle and the rise of the scientific world view was not a simple relationship of rise and fall, but a co-existence, with each permeating the other. Song-Ming Confucians saw the 'heavenly principle' as characteristic of all things, the source of ethics and the norm for implementation, and took it as the basis for the integration of nature, ethics and politics. In this system of thought, there was a constant close relationship between the knowledge of nature and all the myriad things (*wanwu* 萬物), the knowledge of politics and social order (*zhengzhi zhixu* 政治秩序) and the practice of moral standards. Similarly in modern China, the concepts of modern science and *gezhi* 格致 (investigating things in order to reach knowledge) centered on the research into and application of nature.

Moreover, these concepts often interacted with politics, ethics and notions of the social order. Even though replacing the heavenly principle world view (*tianli*) with the general principle world view (*gongli*) was quite an antagonistic process, the belief in the general principle of integrating nature, ethics, politics and art was retained. In the state of shock caused by defeat in the Sino-Japanese War in 1895, Yan Fu, following Spencer's sociological concepts, used the structure of heaven, earth and man to establish a system of knowledge related to nature, society and morality to replace the Confucian system of knowledge. In this new system the highest position was occupied by 'metaphysics' or the study of 'refining the mind and controlling affairs', while mathematics, chemistry, electricity, botany, were situated at the bottom. Belonging to the middle level was agriculture, military science, navigation, mechanics, medicine and mining. This system of scientific knowledge is closely related to the social structure based on empirical observation. For

Yan Fu 嚴復, 'metaphysics' (*xuanxue* 玄學) was closely connected to 'sociology' (*qunxue* 群學), the former including mainly mathematics and calculus, a type of knowledge which can comprehensively include an object's 'principle of inevitability' (*biran zhili* 必然之理), while the latter is capable of applying inductive and deductive methodology to politics, criminal law, finance and historiography (Yan 1986a, vol. 1, p. 92). Therefore, Yan asked «What is sociology? It uses the laws and regulations of science to investigate changes in society, and to understand the past and future. Why say this? Develop the interests of specialized studies, exhaust what is offered by the investigation of their effects upon, and show the method by which it has been governed. This is what the study of science includes. How can scholars today use their studies merely to make their fortunes and fish for fame? Therefore, I combined the three elements of virtue, application and benefiting the masses into one. Sociology makes clear the reasons for order and chaos and the rise and fall [of dynasties]; these three elements are the foundation» (Yan 1986b, vol. 1, p. 123). According to this understanding, by using the methods of classification and gathering evidence, science provided both a new social model and a new principle of morality.

In a large number of texts dating from the late Qing period to the Fourth May era, we can summarize the sharp opposition between the heavenly principle world view and the general principle world view from several perspectives. First, the general principle view reversed the historical outlook of the heavenly principle view, in that the future and not the past came to be viewed as the root of political ideals and the practice of morality. This reversal dismantled the consciousness of historical fracture embedded in the Confucian world view and along with it the determination to continue the tradition by a return to the Classics that arose from this consciousness and replaced it with the consciousness of historical continuity and endless evolution, a determination that certainly broke with the past. Under the direction of this new historical consciousness, it is not by individual moral/political practice, not by reconstructing the classics or returning to the ancients that the genealogy of the Dao's transmission (*daotong* 道統) is reconstructed, but it is rather by devotion to future endeavors embodying the spirit of history that a new ethics is formed. Second, the general principle world view replaced the heavenly principle world view that was based on the 'propensity of the times' (*shishi* 時勢) or the 'circumstances of reason' (*lishi* 理勢) with a linearly progressive concept of time. In traditional thought, the propensity of the times is a component of the transformation of the thing itself, intrinsic to the formation of the Nobleman and his interactions with the times; the transformation of things is not interwoven with the orbit of temporal teleology. On the other hand, linear progressive time provides a teleological frame, meaning that change, transformation and daily life are all included in the orbit of a strictly chronological teleology. Third, the general principle world outlook used atomic theory to construct

the realm of fact, and this challenged the presuppositions of the metaphysics of the heavenly principle world outlook, attempting as it did to construct the basis of ethics and politics according to the logic of facts and rules of nature. The crucial point here is the transformation of the concept of *wu* (物) (things). Within the context of classical ritual and music, *wu* (or 'hundred *wu*' or 'the myriad *wu*') was not an isolated, objective fact, but was a 'thing' within a certain set of relationships, systems, orders, and norms. In the *Zhouli* 周禮 (*Rituals of Zhou*), the 'three merits (*wu*)' (which are used to teach the multitude, to treat them as guests and support them) refer to the six virtues (knowledge, benevolence, sageliness, righteousness, loyalty and harmony), the six modes of conduct (filial piety, friendship among brothers, being in accord with one's neighbors, harmonious relations with your wife and mother's relatives, being trustful, being sympathetic) and the six arts (ritual, music, archery, charioteering, calligraphy, mathematics). From this one knows that the ancient concept of *wu* had a close relationship to a set of ritual norms: *wu* was the demonstration of the natural order, as ritual and music were also the direct embodiment of that order. Therefore the *wu* of the natural order is also the model for ritual and music. In Song-Ming Neo-Confucianism, the relationship between *wu* and the ordering of ritual became distant, *wu* no longer directly presented a ritual norm, but had to pass through 'investigating things', 'approaching things' (*jiwu* 即物), 'exhausting principle' (*qiongli* 窮理), 'reaching the zenith' (*zhiji* 至极) in order to obtain 'principle'. As a result of the universal belief by Song era Confucians that 'principle is one, its divisions are multiple' (*liyi fenshu* 理一分殊) different things each had had their own 'principle,' thus 'investigating things to reach knowledge' (*gewu zhizhi* 格物致知) had a cognitive implication. This is the reason why since the Song dynasty natural science was often placed under the category of 'investigating things in order to reach knowledge'. During the late Qing, a concept of matter (*wuzhi* 物質) or object based on the theory of the atom provided an epistemological premise for empirically-based science and the 'things' in the concept of 'investigating things' also became a factual concept established on the basis of the theory of the atom, and 'principle' in the domain of 'exhausting principle' was no longer moral knowledge, but now indicated the objective law of things. Because of the ultimate institution of a notion of fact based on the theory of the atom, any resistance to the logic of facts or the laws of nature had to be premised on the recognition of the dualism of fact and value.

Clearly, the new general principle worldview is premised upon modern science and its beliefs. Since the beginning of the twentieth century, not only did various kinds of knowledge appear under the classification of science, such as the major divisions of natural science, the social sciences, humanities and the minor divisions of political science, economic science, and administrative science, but 'science' or 'scientific' began to be extensively used as an adjective or modifier. The idea of science came

to virtually dominate the realm of 'truth'. As a result, first, the concept of progress has come to draw a clear line between past and present. «The scientific world and the past few thousand years of non-scientific thought are clearly two different worlds» (Chen 1917, pp. 1-4), it is thus no longer possible to have a new and creative Song-Ming Neo-Confucianism, or humanism based on revisiting the ancients like the Renaissance. Second, just as Comte described human evolution developing from a «religious superstitious period», through a «period of metaphysical fantasy» to «a period of scientific evidence», linear progression replaced the notion of the propensity of the times, and thus the division between religion and science became insurmountable, and the contradiction between theocracy based on religion and a republic premised upon secular science as its epistemology, irreconcilable. Third, due to the qualitative change in the concept of *wu*, divisions among the fields of art, ethics, religion and politics became unavoidable, principally in terms of epistemology and secondarily in the social division of labor. Both at the epistemological and systemic levels, 'two cultures' (scientific culture and humanistic culture) in the realm of knowledge, the separation of church and state in the realm of politics, the distinction between public and private in the social field and the boundary between the rights of society and the rights of the individual in the legal field, came to prevail in the modern world. It has become impossible to shuttle back and forth between ancient times and the present, between art and science, religion and nature in Renaissance fashion.

In twentieth century China, 'scientific divisions' such as past vs. present, religion vs. science, spiritual and material, etc., became strangely intertwined with the categories of Eastern vs. Western civilization. During the late Qing, it had been widely accepted that scientific research, as well as the social norms it developed, played the pivotal role in allowing Western society to win in the competition among civilizations, engendering the method of understanding science in the context of civilization conflict. Science and the general principle based on it, thus became intertwined with the dualisms of Eastern vs. Western civilization and spiritual vs. material civilization. «Spiritual civilization is intrinsic to our country, what we are behind the West in is material civilization only, a difference worth being proud of. Now, however, the West uses material civilization as its base and combines it with spiritual civilization. But for those who want to get rid of our innate spiritual civilization and seek what is called material civilization, China does not know how to absorb the material and combine it with spiritual civilization in order to make up for our shortcomings. But if spirit does not exist, to what can the material attach itself?»²

2 This passage is taken from the third issue (1907) of the early scientific publication *Kexueyiban* 科學一斑 (One Segment of Science), chapter *Lunlixue zhiyan* 倫理學卮言 (Random words on ethics). Author not stated.

In his famous essay, 'Call to Youth', Chen Duxiu 陳獨秀 linked science with the following vocabulary: 'utilitarian' (*shili* 實利), 'general knowledge' (*changshi* 常識), 'reason' (*lixing* 理性), 'proof' (*shizheng* 實証). Their opposites were 'empty forms' (*xuwen* 虛文), 'imagination' (*xiangxiang* 想象), 'arbitrariness' (*wuduan* 武斷) and the like (Chen 1915, pp. 5-6). The former words designated Western civilization, whereas the latter stood as the defining features of Chinese or Eastern civilization. Such arguments put forward in the New Culture Movement did encounter fierce resistance, but even the discourse of resistance in like manner came to be situated within the framework of the discussion of universal general principle that was part of the discourse of civilization. The resisters proclaimed that Chinese civilization was spiritual, moral, and aesthetic while Western civilization was scientific, material and utilitarian.

Against the background of the First World War, people launched a critique of scientific civilization from two different directions. From the cultural perspective, they established that, in contrast to Western civilization, Chinese civilization was one of subjective agency and rejected the universal claims of Western civilization; from the epistemological perspective, through differentiating a dualism between 'science and the philosophy of life', they separated ethics, psychology, and the other social sciences from the holistic system of the natural sciences. They therefore rejected the universal applicability of scientific rules or norms, which was, in truth, to re-establish man as a subjective agent in the realm of epistemology. According to this conception, categories such as science vs. art, science vs. metaphysics, and reason vs. intuition were considered as the characteristics of Western civilization and Eastern civilization respectively. For instance in Liang Shuming 梁漱溟's 1921 work, *Eastern and Western Civilizations and Their Philosophies*, the three cultural paths: Western, Chinese and Indian can be largely summarized in the following schematic:

Eastern = metaphysics = art = opinion = metaphysical talk = noumenon = private morality = returning to the past = the second or third directions

Western = science = academic learning = knowledge = ethics = phenomena = public morality = modernization = the first direction

In Liang's discussion of culture, 'science' is not only a matter of knowledge, and 'metaphysics' does not merely concern ethics, but they suggest two different civilizations represented by science and metaphysics. In the scientific civilization, all sciences, politics, economics, ethics, law, and philosophy are 'science', are rational and are a matter of cognition, but in the metaphysical civilization, all sciences, politics, economics, ethics, rituals, and thought are metaphysical, artistic and intuited. It follows that

with these characteristics of Eastern/Western civilization included in the taxonomy of knowledge, the familiar trivium of natural sciences, social sciences and humanities is closely intertwined with the taxonomy itself. In the 'science and metaphysics debate', Zhang Junmai 張君勱 (Carsun Chang) located the problem in the antagonistic relationship between 'science and the philosophy of life', his purpose being to use the autonomy, variety, aleatory nature, and uniqueness of the philosophy of life to oppose the universalism of science, and thus to clearly differentiate the boundaries between the natural sciences and the spiritual science. As he said, «astronomy is a universal throughout the world, I've never heard of English astronomy or French astronomy» (Zhang J. 1923, p. 29), whereas the «spiritual sciences» such as politics, economics, psychology, sociology, are not based on «a firm and solid principle» (Zhang J. 1923, p. 29).

The diversity of 'the philosophy of life' has a direct relationship with the diversity of a 'nation's' culture and the autonomy of the individual's psyche. The use of the diversity of the spirit to oppose the universality of science and the diversity of culture and history to oppose the universalism of 'scientific civilization' (Western civilization), the principle of subjective difference to oppose the unitary principles and the general standard (*gongli*) principle of 'science', is the historical connotation of 'science and the philosophy of life' as a pair of opposing rhetorical modes. By opposing science to the philosophy of life, the problem of history and culture was ultimately transformed into a problem about abstract and universal knowledge. It was not the difference between Chinese essence and Western function (*zhongti xiyong* 中體西用), or the confrontation of Eastern and Western civilizations, but rather the opposition between science and metaphysics, physics and psychology, reason and intuition that constituted the core of the discussion. With this as the axis, the system of universal scientific knowledge began to split into different and incommensurate fields that were independent of the other, that is, the realm of science and the realm of the spirit.

Through reflection on 'the limits of science', we might put forward a new knowledge system, a system capable of including science and 'knowledge beyond science'. In this system, the fields of metaphysics, aesthetics, religion and ethics have already separated from the realm of 'science' and have been established as independent fields of knowledge. Compared with the original concept of science, this epistemology is still a system of the differentiation of knowledge, but it is metaphysics and not positivist sociology that holds the commanding position, the function of which not only demands retaining metaphysics within the realm of scientific knowledge, but demands the establishing of autonomous fields for psychology, sociology, political science, and economics beyond the domain of science – these fields cannot be governed by science or the science of science, 'sociology', but can only be governed by metaphysics – with metaphysics becoming the premise of all knowledge.

Whether it is the debate over Eastern vs. Western civilization, or over the division between science and the humanities, the core issue is a judgment on the connection between general principles or universalism and domination. During the tide of colonialism, statism and scientism, Zhang Taiyan 章太炎 (1868-1936) asserted that what was called 'general principle' was inextricably linked with power. The process of 'civilizing' under colonialism, the control over individuals created within modern knowledge and its institution is nothing but the form of domination by the generalization of principle. Zhang's exposure of the 'scientific general principle' is based on two fundamental tenets. First, he differentiated two concepts of nature: nature as studied by science as opposed to self-subsistent nature, since it is a nature brought within a specific horizon and domain (that is, nature as constructed by science), and is dominated by the law of cause and effect. Based on this, he thought that science conceived as an explanatory system cannot explain the world itself; 'general principles' and 'evolution' are neither principles of the universe nor *a priori* laws, but rather constructs of human thought. The process of creation of 'general principles' in their guise as inherent qualities of nature is a tortuous representation of the 'private' rather than of the 'general' principle. As a result, 'general principle' is synonymous with control and domination (Zhang T. 1984, vol. 4, pp. 443-444). Second, he liberated the operations of nature from the constraints of teleology, negating any moral implications of evolution, thus rejecting the association of individuals with any historical teleology of evolution, rejecting also the idea that an individual should be looked upon as an instrument of group evolution, and refusing to deconstruct the social ties embedded in custom, habits and traditions in the name of science. Zhang Taiyan's opposition to the 'general principles' did not retreat to particularism, but rather he explored with sharp intelligence an anti-general principle general principle - a world of '*qiwupingdeng*' 齊物平等 (the equality of all things). «The Tao that can be told is not the eternal Tao, and the name that can be named is not the eternal name». Is this not Laozi pointing out to us the way to understand universalism? Zhang Taiyan can be seen as the harbinger of the twentieth century Chinese anti-modern modernity.

Allow me to return to the questions of the general principle and the propensity of the times. At the moment of da Vinci's 'marvelous creation', all the differentiated fields: art, religion, mathematics and calculation were integrated into one. While in Pacioli's writing, specifically in the third chapter on bookkeeping of the *Summa*, paper, Arabic numerals, Italian dialects, the silk road, and the credit relations, trade practices, property rights and capital that had been accumulated in the Mediterranean area, were all synthesized in his theoretical creation. This was the moment of an explosion of creativity and productivity, and the birth of a new universalism. What had been gathered together in this moment was far richer than the creators themselves had been aware of. Goethe said that double-entry

bookkeeping was «one of the finest inventions of the human mind» (Goethe 1910, p. 102), but it might be that Max Weber and Werner Sombart, with their revelations on the relationship between bookkeeping and capitalism, are the ones who best explain the universal significance of Pacioli's theory. Weber believed that one of the most basic prerequisites for the modern capitalistic movements, is to make a rational system of capital accounting the standard for all large industrial enterprises that supply daily needs. Without the development of property, capital, business and credit, double-entry bookkeeping would have remained hidden in the recesses of history, along with its precedents; and without the groundbreaking invention of double-entry bookkeeping in modern capitalistic history, traditional Chinese methods of bookkeeping would have still been buried in the archives or quietly used by some accounting offices somewhere. In 1918, the Beijing government issued the Provisional Regulations of Accountancy and the institution of professional accountancy was thus established in China. The debate over bookkeeping methods of the East and the West was thus opened (cfr. Wei 2010, pp. 101-107) and along with it the juxtaposition of two kinds of bookkeeping systems that has existed ever since, as well as mutual influences and reforms (cfr. Yu 2009, pp. 120-122). Similar to the inquiries frequently raised in studies of scientific, economic, legal, and cultural history, discussions on the history of bookkeeping among contemporary scholars have once again involved themselves with the question that has haunted research for over a century. The question begins in the Weberian manner:

To what combination of circumstances in Western civilization, and in Western civilization only, should the fact should that cultural phenomenon have appeared which (as we like to think) lie in a line of development having universal significance and value be attributed? (Weber 1958, p. 13)

In the latter half of twentieth century, however, this question has been revised by Joseph Needham: given her scientific and technological equality or superiority over the West, when did the divergence between China and the West emerge?³ In the two most recent decades, Needham's question has been pushed one step further by Ken Pomeranz, who argues that there

3 «The further I penetrate into the detailed history of the achievements of Chinese science and technology before the time when, like all other ethnic cultural rivers, they flowed into the river of modern science, the more convinced I become that the cause for the breakthrough occurring only in Europe was connected with the special social, intellectual and economic conditions prevailing there at the Renaissance, and can never be explained by any deficiencies either of the Chinese mind or of the Chinese intellectual and philosophical tradition. In many ways this was much more congruent with modern science than was the world-outlook of Christendom» (Needham 1969, vol. 6, p. 191).

were no advantages unique to the West until 1800, and it was not until the nineteenth century and a fully-fledged industrialization in Europe that the West achieved its dominant position in the world. The propositions based on the notion of 'divergence' bring up other propositions in their wake, one of which may be taken as a revised version of the Weberian question: if in traditional China there existed technological, scientific and economic development (bookkeeping included) similar to or even more advanced than that of Europe, why did capitalism and the industrial revolution emerge in Europe and not in China? Moreover, if we argue that the circulation of the early inventions of Chinese, Indian and other civilizations provided the critical prerequisites for Europe's development, such as, for instance, the invention of paper and the spread of Arabic numerals, that can be seen as the preconditions for the development of bookkeeping, why did European inventions and their transmission fail to promote equivalent development in China and India at an earlier point in time?

All these questions represent rewritings or revisions of the Weberian question of 'development of universal significance and universal value', but do not touch upon the fundamental unevenness of the global capitalist modernity, which suppressed developments or possible developments in other areas. In this sense, the concept of 'early development' in non-Western cultures came from the epistemological framework of linear time. Today exploration of 'divergence' is still going on, while research on 'convergence' has already begun. Along with the development of production, circulation, consumption, transportation and information technology, the integration of the contemporary world has become an inexorable trend, in which 'divergences' have been reassembled in 'convergences', and 'convergences' have in turn produced new 'divergences'. Perhaps these might be divergence within convergence and convergence within divergence. «The Dao produced One; One produced Two; Two produced Three; Three produced the myriad things».

This is the moment of the collapse of 'World History', and at the same time the moment of rethinking world history.

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