Chinese Writing and Abstract Thought: A Historical-Sociological Critique of a Longstanding Thesis

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Abstract

For centuries, numerous Western scholars have argued that Chinese writing is concrete-bound and hence inhibitive of abstract thought in pre-modern China, while alphabetic writing is abstract, and hence enabling of abstract thought. This longstanding and popular view, while originating in Europe, has also had considerable impact in Chinese and other non-Western academic circles. The present paper devises a special-purpose historical-sociological framework in order to examine, in a theoretically-informed way, writing's invention and subsequent development in Mesopotamia/East Mediterranean area and China, on the basis of which the concrete-bound-versus-abstract distinction between different writing systems is debunked. The claim concerning the supposed effects of writing system on mode of thinking is then shown to be theoretically vacuous, logically illegitimate, and empirically ill-informed concerning ancient Chinese thoughts. The present paper's analysis complements that of scholars who show that the ancient Chinese language was not (grammatically or otherwise) inhibitive of abstract logical thought and reasoning.

Keywords: Chinese writing and abstract thought, alphabetic writing and abstract thought, alphabetic literacy theory

1. Introduction

Early in his career, French sociologist-cum-sinologist Marcel Granet commented on Chinese writing as follows:

[Western languages] are instruments of analysis which allow one to define classes, which teach one to think logically, and which also make it easy to transmit in a clear and distinct fashion a very elaborate way of thinking. Now I do not think that Chinese as it is written and spoken, in the slightest degree has any of these qualities … [it is] composed of images rather than concepts … it owes this, in my opinion, to the figurative writing which, linking every word to an ideogram… (cited in Harbsmeier, 1998: 23).

European scholars had been making similar comments for a very long time. Thus, not long before Granet, Max Weber (1951: 123, 125, 127), a co-founder of Western sociology, stated that 'the [Chinese] script retained its pictorial character … Chinese thought has remained rather stuck in the pictorial and the descriptive. The power of *logos*, of defining and reasoning, has not been accessible to the Chinese …The very concept of logic remained absolutely alien to Chinese philosophy, which was bound to script…'.

Many of today's sinologists are aware of Granet's and Weber's error of regarding Chinese characters as pictures, but numerous other scholars continue to commit the same mistake, ranging from the famed media scholar Marshall McLuhan (1964), Chinese mythology expert Yuan K'o (see Birrell, 1992: xi), philosopher Chad Hanson (1993), historical sociologist Toby Huff (2003), to historian of logic Zhou Shan (周山 2009), to name just a few.

On this basis, Chinese writing is supposed to be concrete-bound (Weber's 'descriptive', Granet's 'images'), in contrast to alphabetic writing which is supposed to be abstract. Advocates of this popular view range from the late sinologist Arthur Wright (1953) to contemporary scholars such as English literature professor Walter Ong (1982) and media ecologist Robert Logan (1986).

Further, as logical thinking, etc. are supposed to be alien to Chinese thought because of China's concrete-bound writing, the capacity for logical thinking, etc. is also believed to be due to alphabetic writing. Since the 1960s, this view has been most prominently represented by what is called the alphabetic literacy theory, which continues to be influential today, to be discussed in due course.

There have actually been three different forms in which the question of the supposed relationship between language and thought with reference to pre-modern China has been posed:

1. Chinese thoughts lacked logical thinking, etc. because of the concrete-bound nature of Chinese writing.
2. The Chinese language was not equipped for logical, rational argumentation.
3. Certain practices of traditional Chinese writing (such as lack of punctuation) inhibited it from serving as an instrument of rigorous communication.

Of course, the question is often posed in a mixture of more than one form. Thus, Weber and Granet refer to both language and writing before zeroing in on writing as the ultimate determinant, and Granet also touches upon 3 above. However, it is useful for analytical purposes to distinguish between the above three forms. Firstly, writing in 1 refers to writing system, which, in the consensus of scientific linguistics, concerns how speech is reproduced in tangible form. Language is not the same thing as, and indeed can exist without, writing. Hence, 2 can analytically be posed without reference to writing system. Of course, analysis of 2 (which concerns grammar and so forth) will necessarily be conducted on the basis of language use in written records; but in such an analysis, written records function merely as records, without reference to the system of how speech is reproduced.

On the other hand, the belief that supposedly concrete-bound Chinese writing inhibits the formation of logical thinking etc. can be examined without reference to grammar and so forth. For instance, the alphabetic literacy theory makes claims concerning 1 precisely without such reference. Such claims can therefore be examined independently of 2. As to 3, to which scholars such as Derk Bodde (1992) pay considerable attention, it is obvious that in comparison to 1 and 2, it is of secondary importance, since practices do not constitute structural components of writing system, as shown, for instance, by the fact that ancient Greek also had no punctuation.

The examinations of 1 and 2 are, of course, complementary to one another. The present paper is a sociology paper focusing on 1, but at the end, we shall briefly discuss 2, and comment on how our analysis and the analysis of 2 complement one another.

Thus, what we are concerned with are:

(a) The belief that Chinese characters constitute pictures.
(b) The belief that Chinese writing is hence concrete-bound, whereas alphabetic writing is abstract.
(c) The belief that whereas alphabetic writing enables abstract thought in the form of logical thinking, etc., Chinese writing inhibits abstract thought.

Scientific linguistics has long established that (a) is false, a conclusion now understood by most informed sinologists. The belief that alphabetic writing is more abstract is **intuitively appealing**, as a result of which it is extremely widespread. Our analysis will show that by means of conducting a detailed, theoretically informed investigation into how and why alphabetic writing came into being, thereby showing it to be a particular historical outcome arising from a combination of various contingent circumstances, this appeal will be shown to be **deceptive**. Sections III and IV are devoted to this investigation. We will perforce have to go into writing's invention and development in considerable details in these sections because a synoptic summary would be inadequate for the purpose. After that, as a corollary, Section V will examine why alphabetic development did not occur in China. Belief (c) is partly premised upon (b), and hence the debunking of the latter lays the foundation for Sections VI and VII, which provide a comprehensive theoretical critique of (c).

2. Theoretical Framework and Methodology

First, a terminological note: hereinafter, when the term language is used, unless stated otherwise, the focus is on speech, and writing is defined as that which reproduces speech in the form of tangible artificial signs for communication purposes.

As noted, the analysis of writing's development is crucial to our overall analysis. For this purpose, it is necessary to cover writing's development in both China, and Mesopotamia and the East Mediterranean area (hereinafter, for simplicity, referred to as the Middle/Near East to include Greece). Our data come from the work of epigraphers, archaeologists and linguists.

Their findings reveal one overwhelming fact: writing was invented and subsequently developed in response to **practical needs**. What this finding, which we shall make considerable use of, implies precisely will be explained as we go along. Other than this, the said findings need to be interpreted in terms of a theoretical historical-sociological framework to meet our objectives. Our framework is multi-dimensional, comprising the following:

1. **The role of contingency**. In historical development, contingency often plays a big role. This is accepted by many historians and other scholars. The social theorists Bauman (1991) and Giddens (1984) both stress this. In the physical sciences, chaos theory investigates into systems sensitively dependent on initial conditions, which are not known with precision (Ruelle, 1991). Of particular importance, however, is the work of famed neo-Darwinist palaeontologist Stephen Jay Gould (2002). There is a widespread misunderstanding that evolution is a **unilinear** development leading **inexorably** to humans. Gould provides a comprehensive critique of this view. For our purposes, we need focus on just one aspect of Gould's overall argument, namely, the role played by contingency in evolution. Gould argues that were the game of life to be replayed many times, humans would not have appeared in most of them. The simplest illustration of this is that mammals and dinosaurs co-existed for 100 million years, during which dinosaurs were more adaptive than mammals to the then prevailing ecology. But 65 million years ago, a giant asteroid struck the earth causing drastic changes in the earth's atmospheric environment. Dinosaurs were unable to adapt to this new environment and became extinct, whereas mammals were able to adapt and hence survived. Had this contingent event not occurred, humans might never have come into being. Inspired by Gould, our analysis will show the enormous role played by contingency in writing's development which does not constitute any evolutionary process, while the alphabetic literacy theory precisely assumes that it constitutes a unilinear evolutionary drive from pictures to alphabets.
2. **Path-dependency** and **neo-institutionalism**. These two theoretical perspectives are related. Path-dependency (Aminzade, 1992; North, 1990) argues that in any development, choices made or steps taken at any given point in time determine the constraints upon and possibilities open to the possible trajectory of future development. Development that involves fundamental breaking away from such constraints and possibilities (called **nodal change**) is unlikely due to the cost involved in making such a break. Hence, there is often a tendency for the past to **lock-in** development along a specific trajectory, unless it comes under significant **external impact**. Neo-institutionalism (March and Olsen, 1984, 1996) argues that in any development, past developments are **institutionalized** into systems, practices, procedures, values, etc. which act as **obstacles to change**; as a result, change happens only under significant **external impact**. Our analysis will show how writing's development in the Middle/Near East and China can theoretically be explained from these perspectives in conjunction with the role of contingency.

It is a well-known fact that in scholarly inquiry, the order of exposition is often the reverse of the order of discovery. This applies to our present study. We did not begin our investigation already armed with our perspective and seek facts to fit into it; rather, it was during the process of investigation itself that we realized how writing's development could be understood in terms of the theories and concepts that we now combine into an overall framework as described above.

3. Writing's invention in China and the Middle/Near East

There is still dispute as to whether or not writing was invented independently in Sumer and China, or instead Chinese writing was borrowed from Mesopotamia. We take the currently more favoured former view as the starting point, though it is **not** a necessary condition for our analysis to be valid, since taking the latter view would only entail slight modifications of several minor points in our argument.

Linguists generally agree that writing was invented **in response to practical needs**; in Sumer, for economic administration purposes (Michalowski, 1996); in China, judging by extant archaeological evidence, for divination purposes. Prior to writing proper, there was a precursor stage, in which pictograms[1] that referred to external objects came into being (NB: pictograms are different from ideograms, on which see Section V below). However, pictograms did not constitute writing because they carried only semantic value, i.e. they were interpreted in a direct 'pictogram → meaning' process.

[1] For the convenience of readers unfamiliar with linguistics' terminology, key terms are underlined the first time they are mentioned, to facilitate subsequent referencing of their meanings.

Gelb (1952) calls such precursor-of-writing signs semasiographs. To constitute writing, these signs must go through language, i.e. they must carry both semantic value and phonetic value, i.e. the interpretive process involves 'sign → sound-word (of the language) → meaning'. In other words, sign were meaningful by virtue of being readable. Such sings are called zodiographs.

Hence, writing was invented when pictograms-as-semasiographs were transformed into pictograms-as-zodiographs.[2] Once this occurred, the pictorial aspect became inessential, because so long as the graphic mark was capable of being read phonetically, its meaning followed. This is why in time signs in both Sumer and China were able to become stylized and simplified, to facilitate the act of writing, until the pictorial aspect disappeared altogether or was rendered vestigial only. Clearly, the view that Chinese characters constitute pictures is based upon ignorance of this most basic finding of scientific linguistics.

Writing in both Sumer and China went through the same three stages in its early development (Boltz, 1994). Stage One refers precisely to the transformation of semasiographs into zodiographs. Even at this stage, some adapted pictograms in both Sumer and China were only abstractly pictorial, and some signs did not have any pictorial element at all (Boltz, 1996: 192-3). Obviously, the latter signs could have come into being **only** because signs were now taken as representing sound-word and only by virtue of that meaning.

In Stage Two, that of graphic multivalence, in addition to creating new signs, existing signs were used to represent as yet un-symbolized words in two ways. First was by means of phonetic extension. For instance, in Sumer, /a/ 'water'[3] was used to write /a/ 'in' as well; in Chinese, /ma/ 'horse' was used to write /ma/ 'mother', because the two words in both cases had similar sounds. The use of phonetic extension is known as rebus. The use of rebus was facilitated in both Sumer and China because of the prevalence of monosyllabic words and there were plenty of homonyms (different words having similar phonetic values). Existing signs were used to represent multiple words also by means of semantic extension. For instance, in Sumer, /ka/ 'mouth' was used to write /dug/ 'speak', in Chinese, the same character 目 was used to write /mu/ 'eye' and /jian/ 'to see', both for reasons of semantic closeness.

Through the use of phonetic and semantic extensions, writing could now represent more and more words without the need to create ever greater number of new signs. Further, it enabled words not lending themselves easily to graphic representation to be written. However, the use of these two types of extension also resulted in graphic ambiguity, hence the correct reading of a specific sign now relied heavily on context. To resolve such ambiguities, writing in both Sumer and China developed into Stage Three, the 'determinative' stage.

In this stage, two homonyms represented by the same sign resulting from the use of rebus were distinguished from one another by adding a semantic determinative. For instance, in the case of /ma/ 'horse' and /ma/ 'mother', the graphic mark for /nu/ 'female' 女 was added as a semantic determinative to /ma/ 'mother' 媽.[4]

Similarly, ambiguity was created in a homograph (the same sign representing two different words with related meanings but different pronunciations) resulting from semantic extension. For instance, in Shang oracle bone inscriptions, /kou/ 'mouth' was initially extended semantically to write /ming/ 'to speak, call out' as well. In order to distinguish the two, the mark for /ming/ 'brighten' was added (as a phonetic determinative) to 'to speak, call out' so as to specify its pronunciation unambiguously. After stylization, this character was subsequently written as 名 (Boltz, 1996: 194).

The use of determinatives created compound signs called phonetic-semantic compounds. Compound words were sometimes created by means of a semantic-semantic combination**.**

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[2] Schmandt-Besserat (1992) argues that writing in Sumer began with tokens for counting. Once viewed in relatively favorable light, most linguists have since become unconvinced (see Rogers, 2005).

[3] We follow the practice in linguistics, according to which /…/ refers to pronunciation (in Chinese, we follow the pinyin system) and '…' to meaning.

[4] In this case, the semantic determinative is an independent character which does not change in form when added to /ma/ 'mother'. Often, however, a change in form is involved. For instance, the character /xin/ 'heart' 心 is often added as a semantic determinative, but in modified form, as in the word /qing/ 'sentiment' 情. The modified form is technically called a bound allograph: an allograph is a variation in the written form of a grapheme (a contrastive graphic mark in a script), 'bound' means it cannot stand alone.

For instance, in Sumerian, the marks for 'head' and 'water' were put together to form the semantic-semantic compound word 'to drink'. In Chinese, semantic-semantic compounds constituted the category of characters subsequently called *huiyi* (會意,combining of senses).

Stage Three was completed in Sumer towards the close of -4^{th} millennium, and in China in late Shang ca. -12^{th} to -11^{th} centuries in the oracle bone inscriptions. By Stage Three, the Sumerian script included around 1,200 signs; whereas there were around 1,155 characters in Shang's oracle bone inscriptions (Cooper, 1996: 40; Rogers, 2005: 45). Upon reaching Stage Three, it is theoretically possible to graphically symbolize all words and utterances in a language. The writing system established upon reaching this stage is called a morphographic system, because each sign, called a morphogram, represents a morpheme (a contrastive meaningful unit in the language), though it carries both phonetic and semantic values. After Stage Three, writing's further development in the two places diverged.

4.Writing's Subsequent Developments in the Middle/Near East

To understand writing's subsequent development in the ancient Middle/Near East, it is necessary to briefly examine what is called the morphological typology of languages (Aihkenvald, 2007 – morphology refers to word structure).[5] Languages are typologized on the basis of two criteria: (a) transparency of boundaries between the morphemes within a grammatical word; (b) the degree of internal complexity of words. On the basis of (a), languages are differentiated into isolating, agglutinative and fusional languages; on the basis of (b), into analytic and synthetic languages. Since the latter typology largely complements the former, for simplicity, we focus on the former.

Isolating languages will be discussed later. In relation to agglutinative and fusional languages, it is necessary to understand inflection in forming grammatical words. Inflections include the use of affixes such as prefixes and suffixes and internal word modification such as vowel change to convey grammatical information (tense, mood, voice, number, case, etc.). To illustrate, in English, many nouns are inflected for number with the plural suffixes –s or –es, and many verbs are inflected for past tense with the suffix –ed. But English has various irregular verbs and nouns: in the case of verbs, a vowel change called ablaut is used to express tense, such as 'sing', 'sang' and 'sung'; in the case of noun, a vowel change called umlaut is used to express number, as in 'foot'/'feet' and 'mouse'/'mice'.

Both agglutinative and fusional languages use inflections. The difference between them is that in agglutinative languages (agglutinative means to glue together), grammatical words are mostly formed by joining affixes to word stems, in which the stem and the affixes are invariant. There is thus a one-to-one correspondence between the form and the function of the morpheme, and morphemes are clearly differentiable. The English word 'empowerment' provides an example of agglutination, in which the prefix 'em' and suffix 'ment' are glued to the stem 'power', all three of which remaining unchanged and differentiable. Agglutinative languages also tend to be very regular, especially with few irregular verbs. In fusional languages, word stems are more often inflected, while affixes (sometimes together with the stem) are often fused together into a single or closely united bound form, such that there is no clear boundary between morphemes. For instance, in Latin, the suffix –us denotes masculine gender, nominative case and singular number all at once, and changing anyone of these features will require a different suffix.

Returning to Lower Mesopotamia, there were two ethnic groups living there. The Sumerians in the south spoke an agglutinative language, while the East Semitic Akkadians in the north spoke a fusional language. The more advanced Sumerians was culturally dominant.

That writing was first invented in Sumer was facilitated by the combination of two contingent facts. Firstly, Sumer was a thriving economic region, thereby raising the demand for a means of economic administration. Secondly, the nature of Sumerian as an agglutinative language consisting mostly of monosyllabic words with a large number of homonyms much facilitated the invention of writing.

[5] It should be noted all typologies are more matters of degree, rather than strict divisions with impermeable boundaries. The same applies to all the typologies of writing systems discussed in the present paper. On the morphological typology, the author is grateful to linguist and colleague Dr. Winnie Chor Oi-wan for her advice; the usual caveat applies.

This is because with mostly monosyllabic words, the use of phonetic and semantic extension was greatly enhanced; the presence of a large number of homonyms facilitated the use of rebus; while the agglutinative nature of the language meant that grammatical information could be conveyed by means of the same repertory of signs that represented words with additional signs to represent affixes, since neither word stems nor affixes changed in the process.

Let's take a further look at affixes, such as the English –es to convey plurality. This affix has no stand-alone existence or meaning, and hence is called a bound morpheme (see note 4 on meaning of 'bound'). The sign is hence different from a morphogram, for a morphogram possesses stand-alone existence and meaning. Such a sign is called a phonogram, functioning purely for its phonetic value. It may be a new sign altogether; or it may be borrowed from an existing morphogram that carries the phonetic value concerned.

In the latter case, however, the situation is different from the kind of rebus (phonetic extension) discussed previously – which, for the sake of clarity, we call simple rebus hereinafter. In simple rebus, the same morphogram performs the function of morphogram in both cases. In contrast, when an existing morphogram is used as a grammatical affix, it constitutes and functions as a phonogram and not a morphogram. Phonetically extending an existing morphogram to be used purely as a phonogram is called rebus phoneticism.

The use of rebus phoneticism to write grammatical affixes began in Sumer ca. –2900. From then on, Sumerian was no longer a purely morphographic system. A writing system consisting of phonograms is called a phonographic system. Hence, the phonographic principle had been laid down, and Sumerian became a morphographic system supplemented by phonographic elements (Cooper, 1996).

Besides writing grammatical affixes, Sumerian writing also used rebus phoneticism in two other ways. One was to write foreign words. In fact, the first (purely) phonetically written words in Sumerian were precisely two words taken over from Akkadian (Driver, 1976: 58). Another way was to use an existing morphogram to write a syllable of a polysyllabic Sumerian word. Thus, each of the two morphograms used in this way to write a bisyllabic word functioned as a phonogram.

Archaeological evidence shows that around the middle of –3rd millennium, a number of scribes writing in Sumerian bore Akkadian names (Nissen, 1988: 138-9). It was exactly during this period that a nodal change in writing system occurred. Scholars, from epigraphers, linguists to archaeologists, generally agree that it was due to Akkadian scribes trying to use the Sumerian system to write Akkadian that brought about this change (Driver, 1976; Nissen, 1988; Postgate, 1992). This is in accordance with the path-dependent perspective, because this constitutes a significant external factor.

Why this nodal change occurred is not hard to understand. To use the Sumerian system without modification to write Akkadian's fusional language created immense difficulties due to the latter's fused and word stem inflections. These inflections involved **phonetic changes**, hence the nodal change unsurprisingly occurred in the **phonographic direction** to cater to the phonological **needs** of the inflections.

To better understand this nodal change, it should be noted that a syllable consists of a combination of the following elements: onset or initial (consonant or C before vowel) + nucleus (vowel or V) + coda (C after V); nucleus + coda is known as final. Mora (plural morae) is a phonological unit which is smaller than a syllable but larger than what's called segment (a C or a V). To simplify, the most typical morae are CV and –C (the coda). To illustrate, take the English word cut.[6] In English, this word is represented by three separate signs: c, u, and t, all of which carry no morphemic value but only phonetic value. In the Sumerian system, the word would be represented by means of a single morphogram, which carries both morphemic and phonetic values. Were the word cut to be broken into morae and represented accordingly, it would be done by means of two different signs, namely, one sign for the CV mora cu and another for the –C mora t. In other words, the single syllable is now represented by two signs; what's more, both of these two signs carry only phonetic values.

In Akkadian language, morae figured prominently (this is a contingent fact). Hence, in extending the use of phonography, Akkadian scribes broke the syllable down and devised moraic phonograms. By doing this for the various morae in the language, the numerous inflections required to convey grammatical information could be catered to by means of a relatively small number of signs (Postgate, 1992: 66). The Akkadian system developed in this way constituted a moraic, sometimes inaccurately referred to as syllabic, system (Cooper, 1996: 43-6).

[6] This example is adapted from Rogers (2005: 14).

In comparison to the Sumerian system, the Akkadian system used only 10% of morphograms (retained from the previous system), but twice as many phonograms and, to remove ambiguities from the use of phonograms, determinatives (Fischer, 2004: 53).[7] By breaking the syllable down, the devising of moraic phonograms represented a qualitative leap in phonographic development. However, it should be noted that this was a **technical** innovation engendered by the **need** to resolve **practical problems** brought about by borrowing someone else's system that was ill-suited to the requirements of one's language, and not the outcome of any abstract exercise in abstractly analyzing sound.

Ancient Egyptian was a branch of the Afro-Asiatic family of languages of a fusional nature. Under Sargon the Great's Akkadian empire, the Akkadian system was known to Egyptian scribes. However, the moraic system was not suited to languages in which consonant clusters figured prominently, as it did in Egyptian (Fischer, 2004: 70, 81). Thus, in following the Akkadians' lead in breaking down the syllable, Egyptian scribes instead devised phonograms which prioritized consonant clusters, and by ca. –2200, they had invented the world's first (consonantal) alphabet (Ritner, 1996: 26). Vowels were not represented, but for the native speaker, the vowels required could be inferred from the context. An example of this in English is in the context of talking about vehicles, 'wgn' refers to 'wagon'.

With such a development, Egyptian scribes could theoretically write entirely phonograhically, and this was indeed sometimes done, but only rarely (Fischer, 2004: 39, 47, 84-5; Ritner, 1996: 75). The institutionalization of the previous system was such that Egyptian scribes preferred to write in a dense combination of alphabets, morphograms, determinatives and complements (additional determinatives), the last three of and which being retained from the previous system.

The West Semitic linear abjad (hereinafter abjad, linear means written horizontally in one direction) was a phonographic writing system based upon a consonantal alphabet without the use of morphograms or determinatives that appeared in ancient Canaan ca. –1500. The scholarly consensus is that it was not invented *ex nihilo*, and most scholars are of the view that it was developed under the influence of the Egyptian consonantal alphabet, since the fusional West Semitic tongues, like Egyptian, prioritized consonantal clusters (Albright, 1966; Cross, 1989; Gardiner, 1915).

The abjad spread across the entire Canaan (O'Connor, 1996: 94). The Semitic peoples in Northern Canaan became known as the Phoenicians after –1050. The Phoenician alphabet is sometimes referred to as West Semitic writing 'proper', with completely stylized letters showing no trace of pictography. It was widely borrowed in the area by different groups, including the Hebrews and the Greeks.

The Greeks borrowed writing from the Levant twice. On the second occasion, Cypriote Greeks borrowed the Phoenician alphabet sometime, in the view of most scholars, between -10^{th} to –mid-9^{th} centuries. This was modified into the Greek alphabet sometime between –800 to –775. Alphabetic writing diffused among various parts of Greece. Different local variations came into being, but by the middle of -4^{th} century, all competing versions had given way to the Ionian version (Swiggers, 1996: 267-8).

Ancient Greek was a fusional language. The Phoenician consonantal alphabet fitted its requirements only up to a point. For instance, all Phoenician words (indeed, all West Semitic words) began with consonants; in contrast, many Greek words began with vowels (O'Connor, 1996: 94). As one linguist puts it: 'Greek-speaking scribes were in fact forced to effect major changes merely in order to pronounce the names of the Phoenicians letter, whose meanings were now gone. Some consonantal letters [of the Phoenician alphabet] whose sounds were not needed for Greek … were borrowed, then, only … to be used, as pure vowels instead of consonants' (Fischer, 2004: 125). It is for this reason that the Greek alphabet, following by now age-old principles, symbolized vowels as well as consonants. In doing so, the Greeks simply 'did what many had done millennia earlier in similar circumstances: borrow someone else's system and then adapt it to the immediate needs of the local language' (Fischer, 2004: 124). Subsequently, the Greek alphabet was borrowed by the Etruscans, the Romans borrowed from the Etruscans, and the rest of Europe borrowed from the Romans.

[7] Note that Fischer refers to the moraic system as logosyllabic.

The Greeks were not the first or only ones to symbolize or indicate vowels. Between ca. –1450 and –1250, the Semitic scribes of Ugarit used an abjad in which there were three symbols for the glottal stop[8] combined with a following vowel to suit the language's phonological needs. The 'Greeks alphabet was really simply another variant of this' (Fischer, 2004: 87, 124). Also, over –9th to –5th centuries, certain Northern Canaanite scripts developed various ways of indicating the presence of a vowel by means of consonantal signs; this practice, however, was not adopted by the Phoenicians as their abjad could function perfectly for their language without it (O'Connor, 1996: 94).

There once was, and to a considerable extent still is, a widespread belief that the Greeks invented the alphabet (Havelock, 2003). Ex-advocate of the alphabetic literacy theory Jack Goody (1987) revealed that he had previously been educated to believe that only the Greek script was alphabetic. The famed media scholar Marshall McLuhan regards the Greek alphabet as the 'only one phonetic alphabet' (1964: 83). But as just seen, the abjad is every bit as phonetic and alphabetic as the Greek alphabet.

If the Greek alphabet is not the only alphabet, is there any truth to the claim that the Greek alphabet is the 'complete' alphabet? That depends on what is meant by 'complete'. For instance, the linguist Fischer (2004: 124, 122) notes: 'The Phoenicians themselves were already using an alphabet that was "complete" for their own needs', and if one has to talk about real completeness, 'Only the linguist's phonetic alphabet [which covers the phonemes – a language's basic set of sound – of all languages] is complete, but it is too ponderous for everyday use'.

Nonetheless, there is one sense in which the Greek alphabet can indeed be said to be 'complete', namely, that in addition to consonants, it also symbolized vowels, instead of relying on inference from the context or, as in some forms of the abjad, simply indicating them. This does constitute a major development, which made the Greek alphabet more easily adaptable to other languages, but its significance needs to be put in proper perspective. For in comparison to previous nodal changes – the Akkadians' breaking down of the syllable, the Egyptians' invention of the consonantal alphabet, and the abjad's abandonment of all non-phonographic elements – **the Greek development introduced no new principles**.

In conclusion, a number of observations can be made. The combination of two **contingent** facts facilitated the invention of writing in Sumer: the **practical** demand for a means of economic administration in a thriving economic region, and Sumerian's agglutinative language. The Sumerian system subsequently developed (devising phonograms for affixes and other uses) to suit the **needs** of their language. It was a **contingent** fact that the ancient Middle/Near East area was populated by ethnic groups speaking languages of different types and, even within the same type, different characteristics. In each successive borrowing of writing by one group from another, the system was modified to suit the **practical needs** of the language of the borrowing group. It was the **contingent** fact of the characteristics of the Egyptian language that the consonantal alphabet was first developed, and the **contingent** fact of the contrast between the Phoenician and Greek languages that the Greeks symbolized vowels in addition to consonants. All these adaptations of the borrowed system constituted **nodal changes** arising from the **external** and **contingent** factor of differences in the languages concerned. Had the entire Middle/Near East area spoken agglutinative languages, the Sumerian system might have persisted with little change in the area – cf. had a giant asteroid not struck the earth 65 million years ago, humans might never have appeared.

Although the invention of the consonantal alphabet by the Egyptians meant they could have written by means of it exclusively, but being **locked-in** by the **institutionalization** of the traditional system, they were prevented from fully utilizing their own innovation. Borrowers, however, were **unburdened by institutionalized traditions**, and hence the complete dispensing with the use of morphograms and determinatives in the West Semitic abjad. This was a linear system, and as it spread across the Canaan, it was progressively stylized, with the Phoenician abjad showing no trace of pictography at all. The Canaans were trading peoples for whom ease of writing must have been a central concern. Linearity and stylization precisely served the **practical needs** of this concern.

Meaning and sound are both concrete aspects of a language, and the representation of either is as much a **practical device** as the representation of the other. In each successive borrowing of writing system in the Middle/Near East, **the issue was always resolving practical problems to cater to the borrowing language's practical needs, and the solution was always of a purely practical nature**.

[8] The glottal stop is a type of consonantal sound found in some languages.

In devising moraic phonograms, the Akkadian broke the syllable down to morae; the Egyptians and the Western Semites broke it down further to consonants and vowels, though the latter were not symbolized. On each occasion, it was a case of specific practical problems engendering the devising of specific practical devices to overcome them; sound was analyzed in being broken down – **practically, each time differently in order to resolve different practical problems**.

In **all** the fundamental principles of writing, the Greeks were merely copying from others. In symbolizing vowels, the Greeks were simply concerned with trying **to overcome specific practical problems** arising from borrowing from the Phoenicians, and hence were **not** engaging in any **abstract** analysis of sound at all – in fact, in comparison to the Akkadian innovation, the Greek development was much more 'humdrum'. It is true that the Greek alphabet was more easily adaptable to other languages, but this practical advantage was a particular historical **by-product**, and not because symbolizing vowels was an achievement in abstraction.

In sum, **every nodal change** in writing's development in the Middle/Near East resulted from practical concerns engendering practical solutions and not any engagement in abstraction. As mentioned in the Introduction, the belief that the alphabet is abstract is intuitively appealing. But once the reasons **why** the various nodal changes occurred and the **nature** of these changes are understood, it can be seen that this intuitive appeal is **completely deceptive**. Hence, the different writing systems in the Middle/Near East were simply different practical methods of reproducing speech catering to the different needs of the languages concerned, and cannot be conceived in terms of comparative degree of so-called abstractness. In later sections, we shall see how claims of effects allegedly due to the supposedly more abstract Greek alphabet cannot stand up to scrutiny.

In the 1960s, Ignace Gelb advanced a theory of a unilinear drive towards alphabetization. Today, such a belief has little market among linguists (Rogers, 2005: 276). Our analysis provides a theoretically-based explanation of the following: writing's development did not constitute any evolution because its invention, the borrowing and modification of the borrowed system, etc. were purposive acts, whereas evolution is a spontaneous, unconscious process; alphabetization in the Middle/Near East was simply **a particular historical outcome** of a combination of various specific and **contingent** circumstances; and alphabetization did not involve any unilinear drive from the supposedly concrete to the supposedly abstract.

5.Why was Phonographic Development Absent in Post-Shang Chinese Writing?

In the present section, for simplicity, we use modern Chinese to illustrate, though the relevant period for our analysis is pre-modern. Since our argument is not thereby affected in any way, while the present paper is a sociology, not linguistics, paper, this should be adequate for our purpose.

The view that Chinese characters constitute pictures can actually be sub-divided into two. One is known as pictography, with Chinese characters being seen as pictograms (more accurately, as noted in Section III, pictograms-as-semasiographs). A pictogram is a picture of an object. The other is known as ideography, with Chinese characters being seen as ideograms. An ideogram is a picture of an idea, i.e. a graphic sign (e.g. the 'no-smoking' sign) conveying an idea (smoking is forbidden), in a direct 'graphic sign → idea' process. Many people who are aware that Chinese characters do not constitute pictograms nevertheless believe that they constitute ideograms (e.g. Zhou Shan 周山 2009). However, like pictograms, ideograms need **not** be learned to be understood. In contrast, Chinese characters or Egyptian hieroglyphs require **learning** to be understood. They do not convey ideas, but word-sounds of the langauge, in the 'graphic sign → word-sounds (of the language) → meaning' process. Boltz (1996: 59) remarks thus:

the frequently invoked term 'ideograph' is a misnomer … at no time did any of the graphs that were invented stand for ideas directly; they always primarily represented the sounds of a language, and meaning only as it was associated with those sounds. This is as true for Chinese characters as it is for the graphs of Mesopotamian cuneiform and Egyptian hieroglyphic scripts.

By the time of the *Shuowenjiezi*（說文解字 ca. +100）, the first comprehensive dictionary of characters with explanations of character structure and rationale, there were 9,475 characters, 81.2% being semantic-phonetic compounds, and 12.3% being semantic-semantic compounds (Taylor and Taylor, 1995). It should be noted that Chinese characters represent syllables rather than words. Hence, a more accurate name for Chinese is morpheme-syllable writing (Fischer, 2004: 172), though we continue to refer to it as morphographic for simplicity. In ancient times, monosyllabic words predominated.

Modern Chinese, however, has more bi- or multi-syllabic words (Mair, 1996: 202). In the bi-syllabic word /zidian/ 'dictionary'字典, each character possesses stand-alone meaning, hence the word is bi-morphemic. In contrast, in /hudie/ 'butterfly' 蝴蝶, the two characters have no stand-alone meaning, hence the word is mono-morphemic. Further, to focus simply on the first character, although it is a phonetic-semantic compound, since it lacks stand-alone meaning, it is unlike the usual morphogram; were the semantic determinative not used, it would have functioned as a pure phonogram. Actually, there is evidence that at one time (roughly –800 to –220), pure phonograms (corresponding to *jiajiezi* 假借字 in Chinese) were relatively more common, but they then mostly died out. (Boltz 1994).

Why did Chinese writing remain morphographic since its invention? To examine this, it is necessary to examine the nature of the Chinese language. Morphologically, Chinese is an isolating language (this is a contingent fact). Inflexions are generally absent, affixes are rare (Rogers, 2005: 27),[9] with words having only one grammatical form. Chinese conveys grammatical information by means of the use of additional words, word order in sentences, and inference from context. For instance, instead of using affixes or ablaut to express tense, tense is either inferred, or devices such as the use of adverbs and aspect particles are used. Thus, in the sentence 'she is swimming' 她在游泳 , the verb 'swim' 游泳 is uninflected, and the aspect particle /zai/ 在 is added to express present continuous tense. To express case, the accusative or dative case (e.g. 'me' in English) is unchanged in Chinese, and the additional particle /de/ 的 is used in the possessive case (/wo/, /wo/ and /wode/ 我、我、我的 corresponding to 'I' and the inflected 'me' and 'my' in English). The implications for Chinese writing are obvious: the **practical need** to devise pure phonograms for general use (either as entirely new signs or by means of rebus phoneticism) never arose.

Today, the Sinitic family of languages comprises of over ten tongues, which has come about through a number of splits. During the Middle Chinese period (–100 to +600), the Min 閩 dialect split off; from +600 onwards, the Wu 吳, Yue 粵, Xiang 湘, etc. dialects split off. Despite these splits, the dialects retained the isolating nature of the language, hence the morphographic system continued to serve them well.[10]

The invention of writing in China was facilitated by the **contingent** fact that Chinese was an isolating language of (in ancient times) mainly monosyllabic words with many homonyms. The **contingent** fact that Chinese was an isolating language entailed that the morphograhic system suited its **practical needs** well. The **need** to go in the phonographic direction never arose. Over the centuries since Han, China came into contact with various alphabetic systems, but never modified its writing system. Besides the absence of the need to turn phonographic, one **contingent** feature of the Chinese language actively discouraged any such turn. In English, homonyms are comparatively few, and hence the use of orthographic variations (i.e. different spellings) to convey morphographic information[11] can be kept at a manageable level. In contrast, homonyms were endemic in Chinese. For example, homonyms pronounced i in the fourth tone could be counted by the score, and dozens of them were quite common (Harbsmeier, 1998: 39). Because of this, extensive use of phonography would create immense difficulties.

From the **path dependency** and **neo-institutionalist** points of view, under the above circumstances, with no **external** impetus for change, Chinese writing unsurprisingly remained **locked-in** in its development along the originally set morphographic trajectory. In fact, not only was there no external impetus for change, there was actually an **external** impetus **not** to change. Since the above-mentioned splits into different dialects, a phonographic system in any one of the dialects would be largely incomprehensible to speakers of the other dialects. In contrast, the prevailing morphographic system remained comprehensible to and usable by speakers of all dialects. If for no other reason, this **practical** political and administrative consideration alone would have prevented change towards phonography.

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[9] An example of an affix in modern Chinese is the character /men/ 們 used as a plural suffix in words such as /women/'we' 我們 and /tongxue men/'students' 同學們. Again, were the semantic determinative not used, it would have functioned as a pure phonogram.

[10] Some scholars such as DeFrancis (1989) regard the dialects as different languages instead. This, however, is irrelevant to our analysis.

[11] An example of this is the homonyms 'meat' and 'meet', in which the difference between 'ea' and 'ee' conveys morphographic information.

Our neo-institutionalist plus path-dependent analysis of why Chinese writing remained morphographic can be confirmed by examining the differential developments between Korea and Japan (both speaking agglutinative languages) on the one hand, and Vietnam (speaking an isolating language) on the other, when they borrowed writing from China. For lack of space, we can only do this very briefly (see Fischer, 2004; Rogers, 2005; Taylor and Taylor, 1995 for details).

At first, Korean and Japanese scribes wrote completely in Chinese, both language (in the overall sense) and script; subsequently, they began to write Korean/Japanese by means of Chinese characters. Japanese was initially written entirely by means of borrowed Chinese characters (called *kanji* 漢字). However, as an agglutinative language, Japanese used many verbal suffixes.

With Chinese being morphographic, Japanese scribes were unable to find equivalent Chinese characters to write affixes. Thus, they borrowed certain Chinese characters purely for their phonetic values for the purpose (rebus phoneticism), and to distinguish them, these characters, now functioning as pure phonograms, were written smaller between the main characters and in due course became abbreviated. Besides this, Chinese characters were also borrowed and used as pure phonograms to write individual syllables of polysyllabic Japanese words. Later, Chinese characters were also borrowed and abbreviated to write morae, which played an important role in Japanese. The script of borrowed Chinese characters which were abbreviated and functioned as pure phonograms is known as *kana*. By late 1100s, a mixed system of Chinese-*kanji* and Japanese-*kana* had been fully developed.

Developments in Korea were similar – up to the 15th century, because the linguistic structures of Korean and Japanese were similar. In the 1440s, under order from King Seycong, against the wishes of Korean scribes, Korean writing was transformed into an alpha-syllabic system. The king's order was an **external** and **contingent** factor; the scribes' preference against the transformation was to be expected from the **neo-institutionalis**t perspective.

Vietnam was ruled by China from –111 to +939, during which period 'classical Chinese writing' (the script used from Han until the early 20th-century) was used. After independence in 939, Vietnamese scribes developed a script to write Vietnamese called *chu nom*. Vietnamese and Chinese belonged to different language families, but Vietnamese was also an isolating language lacking inflections. Thus, in developing *chu nom*, there were no inflections which required the devising of ways to write them. Vietnamese scribes developed a large number of new characters unknown in Chinese, mostly probably as a way to express cultural independence. But these characters were formed on the same principles as Chinese characters, primarily in the form of semantic-phonetic compounds. In other words, *chu nom* was developed on the basis, and by means, of fine-tuning the borrowed morphographic system, in a **path-dependent** and **institutionalized** manner. In the 1600s, Westerners devised a Latin-derived alphabet to write Vietnamese, but Vietnamese scribes ignored it and stuck to the *chu nom*. National pride probably played a large part in this. However, given that *chu nom*'s morphographic system suited the needs of Vietnamese language well, Vietnamese scribes lacked the incentive to change the **institutionalized** path of development either. Alphabetic writing eventually took over as a result of a **contingent** and **external** factor: French colonial imposition in 1910.

6. Conclusion: Writing System and Abstract Thought

The above analysis shows that:

a. Different writing systems cannot be compared in terms of relative degree of so-called abstractness..
b. Alphabetization occurred in the Middle/Near East as a particular historical outcome under a combination of contingent factors coupled with the need to satisfy specific practical needs arising from those factors.
c. The Chinese writing system was locked in along the morphograhic trajectory in a path-dependent and institutionalized way under a combination of contingent factors.

Let's now discuss the belief that Chinese writing inhibits the development of abstract thought. This belief is, firstly, premised upon the belief that Chinese writing is pictographic or ideographic. Because of this, it is believed that Chinese characters are processed as pictures, and neuro-psychological studies have repeatedly been conducted attempting to prove it. Reviewing this literature, Flores (1992: 50) states: 'the conclusion that Chinese characters are processed more "like pictures" than like words can hardly be maintained'.

Studies conducted in the late 1980s and early 1990s on Japanese or Chinese show that 'native speakers begin processing characters semantically only after assigning them readings', i.e. in the 'graphic sign → sound-word → meaning' sequence, while studies since 1901 on Japanese have not shown different processing pathways for *kanji* and *kana* (Unger, 1993: 949). This contrasts with the processing of pictograms or ideograms which involves the unmediated 'graphic sign → meaning' sequence.

In recent decades, amongst arguments that alphabetic writing is more enabling of abstract thought than other writing systems including Chinese writing, the alphabetic literacy theory (ALT hereinafter) in the most prominent. Advocates of ALT, for many of whom the Greek alphabet (and its derivations) is supposedly the one and only alphabet, include Goody and Watt (1999[1963]), Innis (1986[1950]), Logan (1986), McLuhan (1964), McLuhan and Fiore (1968), and Ong (1982). ALT continues to be influential today (see the relevant essays in the compilation Crowley and Heyer 2010, now in its 6th edition). In the appendix, we shall discuss the influential McLuhan as a specific illustration of ALT. For now, it is useful to consider ALT in general with reference to Grosswiler's (2004: 156-7) summary of it:

The alphabetic literacy theory argues that the culture of reason fostered by the abstract symbols of the alphabet is vastly different than the less advanced thought that is bound by image-based non-alphabetic writing systems. These writing systems, like Chinese, are thought to be based on pictures and thus are lower on the evolutionary ladder since the related pictograph theory maintains that abstract writing systems evolved from picture writing.

By the 'culture of reason' is meant abstract thinking, deductive logic, and so on (Grosswiler, 2004: 146). Thus, ALT argues:

1. Chinese characters are pictures and Chinese writing is at the bottom of an evolutionary ladder.
2. The alphabetic system is abstract at the top of the same evolutionary ladder.
3. The development of writing constitutes a unilinear evolutionary drive from pictures to abstract letters.
4. Because alphabets are abstract, alphabetic writing enables abstract reasoning, hence alphabetic writing fosters the 'culture of reason'. The reverse applies to Chinese writing.

The idea that the alphabet is more abstract is intuitively appealing, because it is able to reproduce speech by means of a relatively small number of signs. Countless scholars have fallen under the sway of this intuitive appeal. Indeed, without our detailed, theoretically informed analysis of its historical genesis, it would have been difficult to overcome this **intuitive but deceptive impression**. Unsurprisingly, some ALT advocates, such as Logan (1986: 21, cf. p 151), rely on little more than just such an impression: 'The phonetic alphabet … is also the most economical, with the fewest number of signs, and hence is the most abstract'. But as Section IV shows, the 'economical' element is a particular historical outcome with nothing to do with abstractness.

Ong (1982: 90) puts forward two related arguments: 'The vocalic Greek alphabet … analyzed sound more abstractly', and it 'was more remote [implying abstractness] … It could be used to write or read words even from languages one did not know'. Both points have already been addressed in Section IV: concerning the first, the Greeks were **not** engaging in any **abstract** analysis of sound at all; concerning the second, it was a particular historical by-product, and not because symbolizing vowels was any achievement in abstraction.

To return to the above, 1, 2 and 3 are simply false and writing's development does not constitute any evolutionary process. Former ALT advocate Jack Goody (1977, 1987) later retracted partly because he came to a better understanding of the history of writing.

As to 4, sometimes the argument, if it can be so called, amounts to nothing more than a blank assertion: 'This Greek achievement in abstractly analyzing the elusive world of sound into visual equivalents (…) both presaged and implemented their further analytic exploits' (Ong, 1982: 90). Or it may rely on unfounded speculation: 'Kerckhove (1981) has suggested that … the completely phonetic alphabet [i.e. the Greek alphabet] favors left-hemisphere activity in the brain, and thus on neurophysiological grounds fosters abstract, analytic thought' (Ong, 1982: 91). It is interesting to note that the background of Kerckhove, on whom Ong relies for this assertion, was in French and the sociology of art, and the work referenced is a paper on Greek tragedy.

Alternatively, 4 may be argued on the basis of reduction by means of simplistic analogy: 'the [Greek] alphabet serves as a model for division and fragmentation … The Greeks' idea of atomicity, that all matter can be divided up into individual distinct tiny atoms, is related to their alphabet' (Logan, 1986: 107).

In the Appendix, we shall discuss the general issue of ALT's illegitimate use of analogy to assert causation, but for now, let's simply note that as anyone familiar with ancient Greek thoughts well knows, Leucippus and Democritus advanced the idea of atoms in reaction against Parmenides, according to whom reality in its entirety was one **indivisible**, continuous, motionless and changeless 'Being' (Guthrie, 1965, 1969). How according to Logan's reduction is the alphabet supposed to be able **at the same time** to directly shape **both** the idea of atoms **and** its diametrical opposite (Parmenides' 'Being') in ancient Greece is a mystery.

In sum, not only is 4 premised upon the erroneous 1, 2 and 3, no reasonably plausible **theoretical** argument has ever been produced by ALT to sustain it. Very often, **empirical** claims are made as evidence of 4. Sometimes, the empirical claims are simply false, as in McLuhan's claim that the idea of causation would strike cultures such as Chinese culture as 'quite ridiculous' (see the Appendix for details). On other occasions, the claims (such as that modern science first appeared in Europe) are indeed based upon facts. But even in the latter case, as is well-known, facts by themselves do not prove a theory,[12] and hence any theory must, first of all, be argued theoretically before it can make use of facts as supporting evidence.

Given that ALT has never been able to theoretically argue 4 with reasonable plausibility, facts such as that modern science first appeared in Europe do, and can, not constitute evidence in support of it. This is not to say that such facts are not important, but only that they have to be explained in **other ways**.

In the present paper, we hope to have shown that the hypothesized relationship between writing system and abstract thought is unfounded. As mentioned in the Introduction, there is an equally common claim that the Chinese language (in the overall sense) itself is unequipped for logical argumentation. Specifically, claims have been made that the Chinese language lacks the concept of truth, the notion of propositional knowledge, proper word classes, and so on (Hanson, 1985).

Examining the above claims concerns the borderline area between sinology, philosophy (logic) and linguistics (grammar, etc.) – e.g., can the Chinese language grammatically formulate various kinds of logical propositions? The towering Western sinologist on China's indigenous sciences Joseph Needham was skeptical of such claims, but as a scientist, he was unable to address them properly. In Western sinology, the first major breakthrough in undermining these claims was made by Angus Graham (1978), especially in his detailed analysis of Later Mohist logic. In recent years, the work of Christoph Harbsmeier is especially significant. In the late 1980s to mid-1990s, he published various papers on specific claims made about the supposed deficiency of the Chinese language, leading to the publication in 1998 of the definitive *Science and Civilization in China Volume 7 Part I: Language and Logic*. Perusing various ancient Chinese philosophic texts, he shows the presence of the concepts of truth, meaning, contradiction, necessity, property and so forth, and demonstrates how the ancient Chinese language can grammatically formulate various types of logical arguments. Harbsmeier (1998: xxiii) summarizes his findings thus:

It turns out that the [ancient] Chinese language is reasonably well equipped to express rational argumentation, essential to science, and the ancient Chinese have many current forms of argument in common with their contemporary Greeks.

In the Introduction, we mentioned that the analyses of (1) the supposed relationship between Chinese writing and abstract thought, and of (2) the supposed inability of the ancient Chinese language to engage in logical argumentation, are complementary to one another. We hope that our present modest attempt concerning (1) is able to complement Harbsmeier's distinguished study concerning (2).

7. Appendix: McLuhan's Version of the Alphabetic Literacy Theory

There is no need, nor would it be feasible, to go into the specific arguments advanced by each and every ALT advocate. In this appendix, we select McLuhan (1964) as a more detailed illustration of ALT because he is a world-renowned scholar and main inspiration of ALT. His disciple and collaborator Logan (1986) later published a book-length study to elaborate on ALT, which however added nothing of theoretical substance.

In McLuhan's view, 'pictographic and hieroglyphic writing as used in Babylonian, Mayan, and Chinese cultures … give pictorial expression … they approximate the animated cartoon' (p 87).[13]

[12] This is a consensus in the philosophy of science, which for lack of space we are unable to go into here.

[13] All references are to McLuhan, 1964.

Chinese characters are specifically described as ideograms. Cultures such as Chinese and Indian cultures are regarded as 'tribal cultures' (p 84), and, with reference to China, the reason why 'tribalism' has supposedly remained unchanged is reduced to Chinese writing: 'Many centuries of ideogrammic use have not threatened the seamless web of family and tribal subtleties of Chinese society' (p 83).

McLuhan states that 'There have been many kinds of writing, pictographic and syllabic, but there is only one phonetic alphabet' (p 83), namely, the Greek. He speaks of 'literacy built on the phonetic [read Greek] alphabet' (p 82), remarks that 'the phonetic alphabet, alone, is the technology that has been the means of creating "civilized man"' (p 84), and half-laments that 'Western man has done little to study or to understand the effects of the phonetic alphabet in creating many of his basic patterns of culture' (p 82). Thus, only Western culture, which he calls 'phonetic culture' or 'alphabetic culture' (pp 85, 86) to contrast with 'tribal culture', is 'civilized', and this is all due to the effects of the 'only one phonetic alphabet'.

In social theory, the position called **reductionism** seeks to explain everything by attributing it **directly** to a single and supposedly most fundamental cause. For instance, in Marxist theory, what's called vulgar economic determinism seeks to explain everything about society and history directly in terms of economic causes.

Within Marxian academic circles, economic reductionism has long been rejected. While reductionism does work in some – but **only** some – specific cases in the physical sciences (e.g. fundamental chemistry is none other than physics), in social theory in general, reductionism has also long fallen into disrepute. McLuhan's thesis of the supposed effects of the Greek alphabet is a classic case of reductionism applied to the fields of the social and human sciences.

McLuhan argues his reductionist case rather unsystematically in several disjointed remarks: 'the ideogram is an inclusive *gestalt*', 'the lineal structuring of rational life by phonetic literacy'; 'Only alphabetic cultures have ever mastered connected lineal sequences … The breaking up of every kind of experience into uniform units'; 'It is in its power to extend patterns of visual uniformity and continuity that the "message" of the alphabet is felt by cultures' (pp 84-5).[14]

In other words, McLuhan believes that in contrast to the *gestalt* pictures of ideogrammatic writing, the Greek alphabet rationally breaks 'experience' into uniform and lineally continuous units, which clearly refers to the alphabet's letters. For the sake of argument, let's take McLuhan's point at face value, and see how the above is supposed to be enabling of abstract thought. McLuhan does **not** provide any **theoretical** argument for this reduction, but relies on several simplistic analogies, all involving associated empirical claims:

(a) Only alphabetic cultures have ever mastered connected lineal sequences as pervasive forms of psychic and social organization. The breaking up of every kind of experience into uniform units in order to produce faster action and change of form (applied knowledge) has been the secret of Western power over man and nature alike … our Western industrial programs … our military programs … Both are shaped by the alphabet in their technique of transformation and control by making all situations uniform and continuous (p 85).
(b) Tribal cultures … Their ideas of spaces and times are neither continuous nor uniform … It is in its power to extend patterns of visual uniformity and continuity that the 'message' of the alphabet is felt by cultures (p 84).
(c) Even our ideas of cause and effect in the literate West have long been in the form of things in sequence and succession, and idea that strikes any tribal or auditory culture as quite ridiculous (p 86).

Thus, because it is possible to draw superficial analogies between the uniform and lineally continuous alphabet on the one hand, and, on the other, the technical division of labour as epitomized by the assembly line, concepts of uniform and continuous time and space, as well as the concept of sequential cause and effect, the latter three are by virtue of that said to be **directly** 'shaped by the alphabet'.[15] To speak of 'being shaped by' is to speak of causation. Without going into details of the logical properties of analogy here, it can simply be noted that in logical reasoning, argument by analogy can be made use of to draw probabilistic inference (e.g. P and Q are analogous [similar] in respect of certain important aspects, P has property x, there is then a certain probability that Q possibly also has property x), but never to establish causation (such as P is analogous to Q, therefore, Q causes P). Making use of analogy to assert causation must count as an invention of ALT.

[14] The word 'message' in the quote alludes to McLuhan's well-known 'the medium is the message' thesis, which we can skip since McLuhan's meaning is clear enough without reference to it.
[15] The word 'directly' is stressed here and below to emphasize the reductionist nature of McLuhan's arguments.

Further, as the case of Logan's previously-mentioned ill-informed analogical reduction of Greek atomism to the alphabet shows, ALT's analogies are invariably superficial and hence incapable of standing up to scrutiny. This brings us to the empirical claims associated with McLuhan's analogies.

If, as according to analogy (a), it was the alphabet that shaped the technical division of labour, this entails making two empirical claims. Firstly, the technical division of labour should have been Europe's dominant form of production since the introduction of alphabetic writing. But as anyone with the slightest acquaintance with economic history well knows, independent artisan-based production was the dominant form of production in Europe for close to two millennia before the industrial revolution. Secondly, analogy (a) also entails that the technical division of labour is unique to the 'Western man', and cannot be found in 'tribal cultures'.

To speak only of China, the fact however is the reverse: the technical division of labour made its first appearance during the Warring States period (–476 to –221) such as in the manufacture of carriages, and during the Han dynasty (–221 to +220) developed to significant scale in some branches of production such as in the manufacture of lacquer items (Fu, 1981: 249; Fu, 1982: 339, 376).[16]

In drawing analogy (b), McLuhan boldly claims, without any substantiation, that a 'tribal culture' such as China lacked the ideas of continuous and uniform space and time. Though McLuhan does not say so, his idea probably comes from none other than Marcel Granet. Granet's bold statements concerning what he regards as the ancient Chinese mode of thinking made in the 1930s are based upon a very inadequate acquaintance with ancient Chinese philosophic texts. Unfortunately, these unfounded statements have remained influential up to the present day. According to Granet:

For the ancient Chinese, time was not an abstract parameter, a succession of homogenous moments, but was divided into concrete separate seasons and their subdivisions.

Space was not abstractly uniform and extended in all directions, but was divided into the regions, south, north, east, west and centre (original text is in French, translation cited from Chen, 1996: 13).

In other words, time and space in ancient China were, to use McLuhan's terminology, supposedly not broken into uniform and continuous units.

Granet's (and hence McLuhan's) claim is simply false. Thus, the Later Mohists (ca. –4th to –3rd centuries) explicitly defined time (duration) and space in the following terms: 'Duration, the differential extension of time' (久，彌異時也, jiu, miyishi ye),[17] 'Space, the differential extension of location' (宇，彌異所也, yu, miyisuo ye). In both definitions, the term mi (彌) means extension, and the term yi (異) means differential. To speak of extension is, of course, to imply continuity, and in speaking of differential extension, the reference to time and space can clearly not, respectively, be to seasons and regions, but to abstract homogeneous units.[18] Based upon such an understanding, the Han dynasty astronomer Zhang Hang (张衡, +78 to +139) stated: 'The outer edge of space is infinite. The end points of time are infinite' (宇之表無極，宙之端無窮, yuzhibiao wuji, zhouzhiduan wuxiong). Without the concepts of the continuous extension of abstract homogeneous units, it would, of course, be impossible to conceptualize infinity. Incidentally, the Chinese terms yu 宇(space) and zhou 宙(time) joined together form a new word yuzhou 宇宙 which means cosmos. In other words, the ancient Chinese conceived of the cosmos as extending infinitely in both time and space. In contrast, it is well known that for Aristotle, the cosmos is spatially finite consisting of discrete rings – ironically, Granet's erroneous claim that the ancient Chinese were unable to conceptualize space beyond regions seems more applicable to Aristotle's discrete rings.

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[16] Fu's texts are listed in the bibliography in Chinese under Fu's name in Chinese (傅築夫). Texts in Chinese are listed at the beginning of the bibliography, first in Chinese, followed by romanization in pinyin according to current general academic practice.

[17] In citing ancient Chinese philosophic texts, the translation in English is first given, followed, in brackets, by the Chinese original, and its romanization in pinyin.

[18] All our translations of the Later Mohist text (chapters 40 to 45 of the book *Mozi*《墨子》) are based upon the interpretations of authoritative interpreters-cum-annotators such as Sun Yirang (孫詒讓) and Tan Jiefu (譚戒甫). On the Later Mohists' concepts of time and space, Yang Xiangkui (楊向奎), 1995 is especially relevant. The above works are listed in the bibliography in Chinese.

Besides the Later Mohists, the Logician (名家, ming jia) Hui Shi (惠施, ca. mid –4th to early –3rd centuries) and his followers (up to –221) left behind a number of propositions (命題, mingti), a number of which concern the divisibility of time and space down to the infinitesimal approaching zero as the limit, which are far superior to the superficially similar paradoxes of the ancient Greek philosopher Zeno.[19] Contrary to McLuhan (and Granet), without the concepts of continuity and uniformity, it would simply be impossible to advance propositions concerning limit and the infinitesimal.

In drawing analogy (c), McLuhan makes another bold claim, again without any substantiation, namely, that since 'tribal cultures' such as China are based upon ideogrammatic writing, it is simply impossible for them to have or even to appreciate the idea of causation. Let's examine this by first considering the concept of cause in ancient Greece.

As is well-known, Aristotle distinguished between four kinds of cause, of which only efficient cause approaches the modern concept of causation. Aristotle did not have the concepts of necessary and sufficient conditions in relation to efficient cause; and according to the scholar of ancient Greek thoughts Geoffrey Lloyd, it was the stoic philosopher Chrysippus (–3rd century) who first explored some of the issues involved: 'He does not have the terminology of necessary and sufficient conditions but explores some of the distinctions that those terms can be used to express' (Lloyd and Sivin, 2002: 160).

In contrast to the above, the Later Mohists did not only explore the distinctions concerned, they also had the terminology as well as advanced definitions of the terms concerned. First, cause is defined as 'Cause, that which when present produces something subsequent to it' (故，所得而後成也, gu, suode erhoucheng ye). The Later Mohists then introduced the concept of xiaogu (literally small cause) and defined it as 'its presence does not necessarily lead to something subsequent to it, its absence necessarily entails that that something subsequent to it will be absent' (小故，有之不必然，無之必不然, xiaogu, youzhi bubiran, wuzhi biburan). In today's terminology, xiaogu is none other than necessary but insufficient condition. Then follows the definition of the concept of dagu (literally big cause): 'its presence necessarily lead to something subsequent to it, its absence necessarily entails that that something subsequent to it will be absent' (大故，有之必然，無之必不然, dagu, youzhi biran, wuzhi biburan). In today's terminology, dagu is none other than sufficient and necessary condition.

How about sufficient but not necessary condition? In the relevant part of the Later Mohist text, this is not mentioned. Since the Later Mohists were already explicitly talking about xiaogu and dagu, it seems reasonable that they should also have considered the case of sufficient but not necessary condition. Indeed, in another part of their text (known as the Xiaoqu [小取篇] chapter), which deals explicitly with methodological issues, they did discuss an issue that can be expressed in terms of sufficient but not necessary condition: 'the it-is-so is identical, why it is so need not be identical' (其然也同，其所以然不必同, qiran yetong, qisuoyiran bubitong). In modern terminology, 'the it-is-so' refers to the same phenomenon, the 'why it is so' refers to the cause. Thus, the same phenomenon might be entailed by, say, X or Y individually; with both X and Y being sufficient but not necessary condition for the phenomenon being caused.

We have discussed the Later Mohists' concept of cause because this paper concerns Chinese thought, but in fact something much less is already sufficient to rebut McLuhan. Witchcraft in early human societies made sense only on the basis of the existence of a rudimentary, if not explicitly stated, concept of sequential cause and effect.

McLuhan makes sweeping unsubstantiated claims about 'tribal' civilizations such as China, despite obviously knowing little or nothing about ancient Chinese thoughts.[20] He then attributes them **directly** to the supposedly ideogrammatic nature of Chinese writing in a form of reductionism based on nothing more than an illegitimate use of analogies, the associated empirical claims of which cannot stand up to scrutiny. It is ironic that this style of reasoning forms the backbone of a thesis hailing from a 'phonetic culture' which claims logical rigour to be exclusive to that culture.

[19] The significance of these propositions has long been common knowledge within Chinese mathematics circles. For two sources in English, see Chen, 1987 and 1996: 14.

[20] Despite providing somewhat more discussion on ancient Chinese thoughts, Logan (1986) fares no better, for he relies on outdated references most of which are as ill-informed as Granet's work. The most 'update' reference he cites is the 1979 edition of Joseph Needham's *The Grand Titration*, which is actually a poor collection of disjointed lectures and essays from the 1940s to the mid-1960s first published in 1969.

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