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Contents

Editor's Note

Building upon the success of the first five editions, The Editorial Board is proud to present you with the culmination of our students' high-level research in this, sixth edition of Bauhinia. Coming full circle, as expressed by the Chinese concept of Wuxing 五行, we revisit the first part of this cycle and showcase how, despite the global upheaval, our research efforts remain constant.

The stated purpose of this student research journal is to honor excellent scholarship, demonstrated either as part of our distinguished curriculum and elective courses, or as a product of our unique extracurricular programs. The *Eight plus One* Virtues are the foundational values of the ISF community and, while the works herein manifest many of these guiding principles, we wish to highlight in particular our students' pursuit of 'Zhi' (Intelligence & Wisdom) and 'Ai' (Passion for Learning & Life) during this process.

To accommodate the proliferation of research produced by our students, especially during this era of COVID-19, when many other forums for publication were either cancelled or moved online, this volume is divided into two parts: the first issue contains articles that are more Humanities-focused, whereas the theme for the second issue is STEM (Science, Technology, Engineering, and Mathematics).

Please enjoy the diversity of topics Bauhinia VI has to offer, which include the following: how the ghostly figure of the courtesan (Su Xiaoxiao) became a theme in Chinese poetry; why Hellenic Atomism never emerged in ancient China; how the cosmological models of Aristotle and Zhang Heng differed; in what way bacteriophages drive the survival and virulence of *E. Coli* in a soil environment; and how horizontal gene transfer enables *E. Coli* to acquire halotolerance in seawater.

The Editorial Board invites the reader to join this academic community by delving into the topics that sparked such passion in our students. We welcome all engagement and responses: sy_team@isf.edu.hk.

編者的話

在前五期成功的基礎上，編輯部很自豪地將我們學生的高水平研究成果呈現在第六期《紫荊花》中。如中國的「五行」概念所表達的那樣，在完成了一個週期循環後，我們重新進入一個週期的開端，在全球動蕩的情況下，向讀者展示展示我們的研究工作如何保持進行。

這本學生研究期刊的目的是為了表彰優秀的學術成果——無論是作為我們的傑出課程或選修課的一部分，還是作為我們獨特的課外活動的一部分。「八德一智」是弘立大家庭的基本價值觀，雖然這裡的作品展示了許多這些價值原則，但我們希望強調學生在這個過程中對「智」（智識見與智慧）和「愛」（對學習和生活的熱情）的追求。

為了適應我們學生研究工作的發展，特別是在 2019 冠狀病毒流行的時期，許多其他出版被取消或轉移到網上，本卷分為兩期：第一期的文章更注重人文，而第二期的主題是 STEM（科學、數學、工程和數學）。

請欣賞《紫荊花》第六期的多元主題：蘇小小的鬼魂形象如何發展為歷代中國詩歌的一個主題？亞里士多德和張衡的宇宙模型有何不同？古希臘所推崇的原子論在為何在中國古代從未出現？細菌噬菌體（感染細菌的病毒）如何推動大腸桿菌在土壤環境中的生存和毒力？水平基因轉移如何使大腸桿菌在海水中獲得耐鹽性？

編輯部邀請讀者加入到這個學術共同體中來，深入探究引發我們學生激情的話題。我們歡迎大家的參與和回應：sy_team@isf.edu.hk

Artist: Christina Chiu, G12

Title: *In Red*

Medium: Oil paint and fabric on board

Description: Inspired by the work of Tao Aimin, this piece is a reflection of gender identity in Chinese culture through an anthropological lens. While the sense of tranquility portrays how female figures embody history, it is a reminder of how culture is a heritage that travels through time and space and will always remain as part of Chinese women's character.

A Note about Style

Articles included in this publication are written for many different purposes. Any differences in style are due to the need to adhere to the format required for that purpose. Generally, the Modern Language Association (MLA) citation and format style (8th Ed.) is used for articles written in English as part of the Oxford University *Shuyuan* Classics Summer Program or the NRI Scholar's Retreat (Needham Research Institute, at Cambridge University). However, articles writte in the STEM fields were offen adapted from posters students prepared for the American Microbiology Society conference (ASM Microbe) and they adhere to the American Psychological Association (APA) citation and format style (7th Ed.). Articles written in Chinese use footnotes following the style outlined in the Bulletin of the Institute of Chinese Literature and Philosophy. However, articles that were originally submitted as partial fulfillment of the International Baccalaureate (IB) programmes, such as the Middle Years Programme's (MYP) Personal Project or the Diploma Programme's (DP) Extended Essay, have followed the specific requirements as outlined by the student's supervisor, and they are published in this journal as they were originally submitted. A footnote under each article indicates the program from which each piece of work was culled.

關於文體的說明

本出版物中的文章是為許多不同目的而寫的。任何風格上的差異都是由於需要遵守該目的所需的格式。一般來說，牛津大學書院經典暑期班或劍橋大學 NRI 研究所（Needham Research Institute）暑期班的英文文章，採用現代語言協會（MLA）的引文和格式（第 8 版）。然而，STEM 範疇的論文大多引用自美國微生學會研究會上的文章，採用美國心理學會（APA）的引文和格式（第 7 版）。中文撰寫的文章採用中研院《中國文哲研究集刊》的腳注樣式。但是，如果是作為國際文憑課程（IB）的部分內容而提交的文章，如中學課程（MYP）的個人項目或文憑課程（DP）的擴展論文，則按照學生導師提出的具體要求，按原樣在本刊發表。每篇文章下的腳注都注明了文章入選前所屬的項目。

Ancient Views of the World:

How do the Reasoning Methodologies Behind the Cosmological Models of Aristotle and Zhang Heng Differ?

Candace Yan Yue Chung

Introduction

Throughout history, numerous philosophers from around the world have posited different cosmological models[1] to improve our understanding of the world. Of all the cosmological models regarding the Earth, the most prominent ones are the 'Flat Earth' and the 'Spherical Earth' models. The Spherical Earth model emerged in ancient Greece, with Aristotle providing arguably the most complete thesis supporting this model. In ancient China, Zhang Heng 張衡 was a prominent advocate for the *Hun Tian Shuo* 渾天說, in which a flat, circular, Earth is enclosed in a spherical heaven.[2]

In this paper, I will argue that Aristotle mainly uses deductive reasoning[3] based on empirical evidence[4] to derive his model, while Zhang Heng's model stems from metaphysical beliefs[5] and is only occasionally supported with logical reasoning. I will begin with an account of Aristotle's spherical Earth and an analysis of the main arguments he used to derive this model. Similarly, I will provide an account of Zhang Heng's *Hun Tian* model as well as an analysis of the reasoning behind it. Subsequently, I will compare and contrast these models in order to demonstrate the similarities and differences in Aristotle and Zhang Heng's reasoning methodologies. The main points of comparison include the two philosopher's assertion of symmetry, use of logical reasoning, and their perception of the relationship between heaven and Earth. Finally, I will conclude and discuss the possible implications of my research: that by investigating the different reasoning methodologies these philosophers use, we can better understand the fundamental differences in ancient Chinese and Greek thought.

1. Aristotle's Cosmological Model

Aristotle's cosmological model posits a spherical earth in the centre of a finite, spherical heaven. The two main arguments he makes to conclude that the Earth is spherical are the 'eclipse terminator line' argument and the 'observation of stars at different locations' argument.

1.1. The 'Eclipse Terminator Line' Argument

The first argument Aristotle proposes is that the shape of the terminator line (the shape of the boundary of the shadow cast by an eclipse) shows that the Earth is spherical, as any other shape would not reflect the observed terminator line. In this argument, Aristotle uses empirical evidence to support his premise:

> If the Earth were not spherical, eclipses of the moon would not exhibit segments of the shape they do. As it is, in its monthly phases the moon takes on all varieties of shapes — straight-edged, gibbous, and concave — but in eclipses, the boundary is always convex. Thus, if the eclipses are due to the interposition of the Earth, the shape must be caused by its circumference, and the Earth must be spherical.
>
> (Arist. *De caelo* II.14. [Guthrie Trans.])

This article was written as a culminating essay for the *Shuyuan* Classics Summer Program at Oxford University, 2019.

[1] The parameters of a cosmological model in this paper are defined as heaven and the Earth, with a particular focus on the Earth.

[2] Heaven in this context refers to the observable universe.

[3] Deductive reasoning is the process of arriving at a logically sound conclusion based on a series of premises.

[4] Empirical evidence is verifiable information received by the senses through observation.

[5] Metaphysics is defined as the branch of philosophy that examines the fundamental nature of reality which involves *a priori* knowledge (knowledge independent of all experiences).

Below is a reconstruction of Aristotle's argument:

Premise 1: If the Earth was not spherical, the eclipses of the moon would not exhibit segments of the current shape.

Premise 2 (empirical evidence): During eclipses, the boundary line of the moon is always convex.

Conclusion: The Earth is spherical.

This argument has a fairly simple structure:

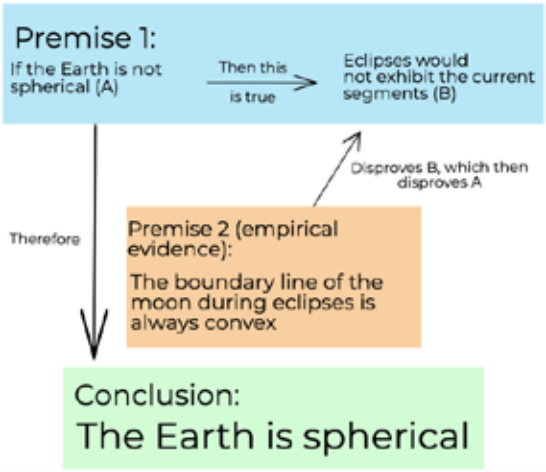

Figure 1. Flowchart of Aristotle's Argument

Let statement A be the sphericity of the Earth and statement B be the exhibition of the current shadow segments during an eclipse. In Premise 1, Aristotle essentially states that if statement A is not true, then statement B is also false. Subsequently, Premise 2 shows how statement B is true by using empirical evidence, therefore proving that statement A is also true. Hence, from this reconstruction of Aristotle's argument, it is clear that his argument is valid[6].

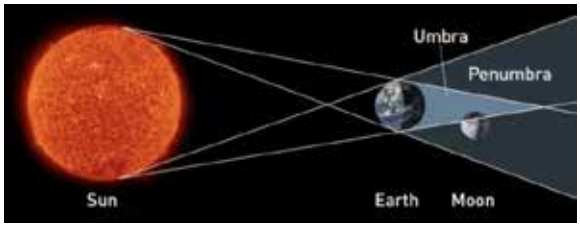

Figure 2. Diagram of the interpositioning of the Earth between the sun and the moon (*Mortillaro*)

Importantly, Aristotle also justifies the soundness[7] of his argument. Firstly, Aristotle explains that eclipses are due to the interposition of the Earth between the sun and moon, which suggests that the shape of the shadow cast by the eclipse must be due to the Earth's circumference (Figure 2). Hence, Aristotle shows us that the terminator line is related to the sphericity of the Earth. Secondly, the empirical evidence used to support Premise 1 (*i.e.* Premise 2) can also be proven to be true via observation. Thus, Aristotle's argument is also sound.

1.2 The 'Observation of Stars at Different Locations' Argument

The second argument he proposes in support of a spherical Earth concerns how the positions of the stars in the sky shift when the observer moves to different parts of the Earth. He also shows that the Earth is not of great size using this argument.

> Observation of the stars also shows not only that the Earth is spherical but that it is not of great size, since a small change of position on our part southward or northward visibly alters the circle of the horizon, so that the stars above our heads change their position considerably, and we do not see the same stars as we move to the North or South. Certain stars are seen in Egypt and the neighbourhood of Cyprus, which are visible to more northerly lands, and stars which are continuously visible in other northern countries are observed to set in the others. This proves both that the Earth is spherical and that its periphery is not large, for otherwise, such a small change would not have had such an immediate effect.
>
> (Arist. *De caelo* II.14. [Guthrie Trans.])

This argument adopts the same structure as the previous argument:

Premise 1: If the Earth is a sphere that is not of great size, travelling a small distance southward or northward would change the position of stars considerably.

Premise 2 (empirical evidence): Stars seen in Egypt and Cyprus are visible to more northerly lands and stars observed there are seen to set in others.

Conclusion: The Earth is a sphere that is not of great size.

[6] Assuming the premises are correct, the conclusion naturally follows the premises.
[7] The argument is valid and the premises are correct.

As seen from this reconstruction, this argument is also valid and sound. This argument follows the same structure as the previous argument:

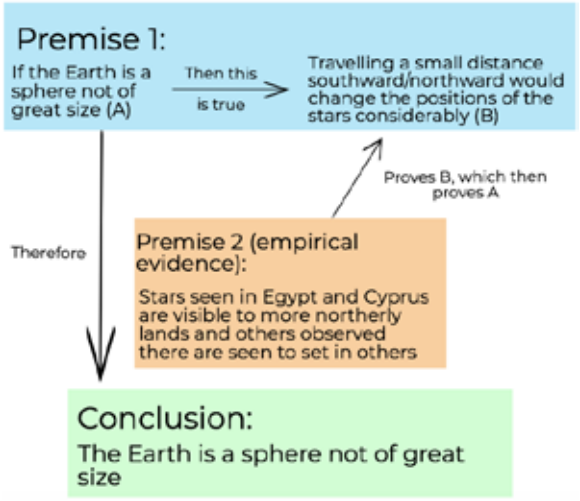

Figure 3. Flowchart of Aristotle's Argument

Let statement A be the fact that Earth is a sphere that is not of great size and statement B be travelling a small distance southward or northward would considerably change the position of stars. In this argument, Aristotle states that if statement A is true, statement B would be true. Aristotle then establishes that statement B is true using empirical evidence (Premise 2), proving statement A is true. Therefore, this argument is valid.

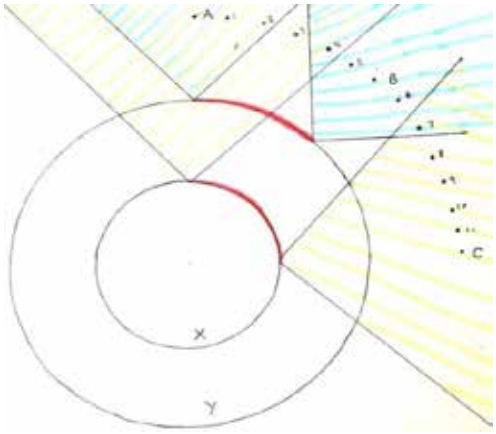

Figure 4. Diagram that shows the soundness of Aristotle's argument

Again, Aristotle justifies the soundness of his argument. As seen in the diagram, traversing a certain distance on a smaller sphere would cover a larger fraction of said sphere's circumference compared to a bigger sphere (demonstrated from the red lines on sphere x and y), changing the circle of the horizon more (demonstrated by the coloured regions [yellow for sphere x and blue for y]) (Figure 4). If the observer moves to different points of a spherical Earth, their view of the stars in the sky would change along the curvature of the Earth. Hence, Aristotle shows the relevance of the observation of stars at different locations to the sphericity and size of the Earth. Similar to the previous argument, since Premise 2 is empirical evidence, it can be proven true via observation. Therefore, this argument is also sound.

Thus, Aristotle primarily uses deductive reasoning to derive his cosmological model.

2. Zhang Heng's Cosmological Model

Zhang Heng's *Hun Tian* model entails a flat earth[8] in the centre of a spherical heaven. In the *Hun Yi Zhu* 渾儀注, he describes his cosmological model as follows:

> 天如雞子，天大地小，天表裏有水，地各乘氣而立，載水而浮。
>
> 《經典集林・渾儀注》
>
> "The heavens are like a chicken egg; the earth, like the yolk of the egg, lies alone in the centre. Heaven is large, and earth small. Heaven has water both on its surface and inside. Heaven and earth both ride on air to stay upright and float on the waters to travel."
>
> (*Jing Dian Ji Lin* [*Hun Yi Zhu*])

This shell and yolk analogy may cause some to believe that in this model the earth is conceived as round like the yolk of an egg. However, this belief is disputed by this quote in the *Ling Xian* 靈憲:

> 天體於陽，故圓以動；地體於陰，故平以靜。
>
> 《經典集林・靈憲》
>
> Heaven takes its body from the *Yang*, so it is round and in motion. Earth takes its body from the *Yin*, so it is flat and quiescent
>
> (*Jing Dian Ji Lin* [*Ling Xian* Trans])

[8] As the ancient Chinese did not have the concept of Earth being a planet, 'earth' is interpreted as land, and is in lowercase form when discussing Zhang Heng's model.

As the Taoist belief of *Yin* 陰 and *Yang* 陽 consists of elements with opposing yet complementary properties, Zhang Heng uses this to justify earth and heaven's opposing qualities ("flat and quiescent" and "round and in motion", respectively). Heaven is classified as *Yang* and earth is classified as *Yin* because of their respective weights. Since *Yang* is light and *Yin* is heavy, the two separated from their previously mixed state, *Hun Dun* 渾沌, into 'heaven' and 'earth' [9]. This metaphysical belief is a core principle in Taoism, which is why philosophers like Zhang Heng didn't explain why the earth and heaven had the qualities that they did; they considered *Yin* and *Yang* as sufficient justification.

3. A Comparison BetweenAristotle and Zhang Heng's Cosmological Models

The main similarities between Aristotle and Zhang Heng's cosmological models are that both assert the concept of symmetry and utilize logical reasoning. However, the two philosophers use logical reasoning for different purposes, and they also portray different relationships between heaven and Earth.

3.1 Both Aristotle and Zhang Heng Assert Symmetry in their Cosmological Models

Both Aristotle and Zhang Heng make invalid assertions about the symmetry of their cosmological models. In this context, symmetry will be defined as the correspondence between two elements: the correspondence across an axis.

Regarding the climate zones on Earth, Aristotle describes them as follows:

> For there are two habitable sectors of the Earth's surface, one, in which we live, towards the upper pole, the other towards the other, that is the south pole…These [drum-shaped sectors] are the only habitable regions, for the lands beyond the tropics are uninhabitable, as there the shadow would not fall towards the north, and we know that the Earth ceases to be habitable before the shadow disappears or falls towards the south, while the lands beneath the Bear [leave] are uninhabitable because of the cold.
>
> (Arist. *Mete.* II.V. [Lee Trans.])

This description is paired with the following diagram (Figure 5):

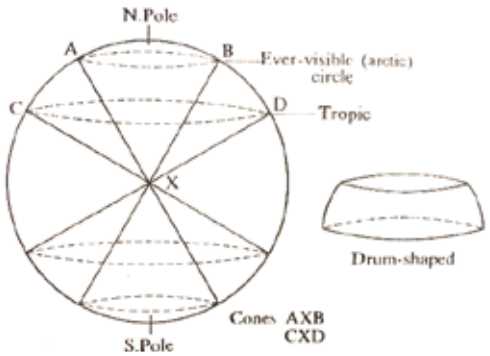

Figure 5. Diagram of the 5 climatic regions on Earth (*Arist. Mete. II.5. [Lee Trans.]*)

Aristotle believed that the Earth has two uninhabitable regions at the North and South poles and another uninhabitable region at the equator, while the other two drum-shaped sectors at the tropic are the only habitable regions. It is clear from the diagram that the sectors are symmetrical at the equator. However, Aristotle does not abide by his strict deductive reasoning. Aristotle neither justifies why the climate zones are split symmetrically nor arrives at this conclusion through deduction; it is merely assumed.

This is evidenced when Aristotle attempted to deduce the position of the south wind:

> Since, then, there must be a region which bears to the other pole the same relation as that which we inhabit bears to our pole, it is clear that this region will be analogous to ours in the disposition of winds as well as in other respects. This proves that our south wind is not the wind that blows from the south pole. But it does not blow from the winter tropic any more than from the south pole. For there would have to be a wind from the summer tropic if the correspondence is to be complete.
>
> (Arist. *Mete.* II.5. [Lee Trans.])

Although this argument is about the winds and not about the climatic zones, Aristotle still uses such symmetrical correspondence to justify his argument about the position of the south wind, much like how he believes the climatic zones to be symmetrical at the equator. Hence, it is clear that Aristotle did not arrive

[9] See Bai Hu Tong De Lun, Book 8, Chapter: Heaven and Earth 白虎通德倫 卷八: 天地

at a symmetrical model through deductive reasoning, but rather merely asserts it.

Similarly, the concept of symmetry also features in Zhang Heng's model of the Earth.

> 天有九領，地有九域；天有三辰，地有三形。
>
> 《經典集林・靈憲》
>
> Heaven has nine positions; Earth has nine domains. Heaven has three luminary bodies; Earth has three configurations.
>
> (*Jing Dian Ji Lin* [*Ling Xian* Trans])

In Zhang Heng's version, the number of places and objects in heaven and the earth correspond. When heaven has nine positions, earth has nine domains; when heaven has three luminary bodies, earth has three configurations. One of the reasons is because Taoism is centred around symmetry, equilibrium, and duality. For instance, his division of heaven into nine "positions" reflects the Taoist beliefs of *Yin* and *Yang*, as heaven is considered the greatest *Yang* and nine is the greatest *Yang* number (single-digit odd number). However, that doesn't mean that Zhang Heng's account is solely influenced by metaphysical beliefs, as some categorizations do involve observations (e.g. the different configurations[10] [high, level, and low ground]) and the three luminary bodies in heaven (sun, moon, and stars). For example, the division of heaven into nine positions can also be interpreted as a division based on the eight directions and the centre.

3.2 Deriving a Model through Logical Reasoning vs Supporting a Model using Logical Reasoning

Both philosophers include logical reasoning which includes mathematical reasoning in their cosmological models. However, while Aristotle uses logical reasoning to establish his model, Zhang Heng uses logical reasoning only when it doesn't conflict with his metaphysical beliefs.

A further argument Aristotle makes to support the sphericity of the Earth is that objects falling towards Earth do not fall in parallel lines. In this argument, he makes use of a comprehensive diagram to visually represent his empirical investigations and logical thinking.

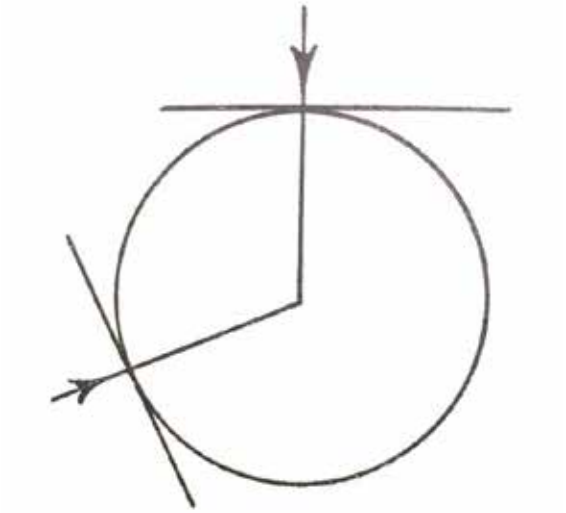

Figure 6. Diagram of the Earth (circle) that proves the Earth is spherical. Arist. *De caelo* II.14. (Guthrie Trans)

In the above diagram, Aristotle clearly displays his mathematical reasoning. He illustrates how objects falling towards the centre of the Earth (represented by the arrows), would imply that the Earth is a sphere. The tangent lines also explains why people observe objects to seemingly fall at a right angle to the ground. A noteworthy feature of this argument is that, while Aristotle reaches the correct conclusion concerning Earth being a sphere, his argument is not actually sound, as it is constructed on an incorrect premise. Aristotle developed the notion of objects going towards the centre of the Earth according to the previously hypothesised premise that Earth is at the centre of the universe and that the natural motion of objects is to fall towards that centre[11]. Nevertheless,

Aristotle still used deductive reasoning to establish his cosmological model.

However, Zhang Heng uses logical reasoning (namely mathematics) to contextualize his model as long as it did not come into conflict with his metaphysical beliefs:

> 八極之維，徑二億三萬二千三百里，南北則短減千里，東西則廣增千里……通而度之，則是渾也。將覆其數，用重差鉤股，懸天之景，薄地之儀，皆移千里而差一寸得之 。
>
> 《經典集林・靈憲》

[10] See Bai Hu Tong De Lun, Book 3, Chapter: Feng Gong Hou 白虎通德論 卷三: 封公侯

[11] See Guthrie's translation of Aristotle's *De Caelo* Book 2, Chapter 14.

> The diameter of the farthest points of the heavens is 200,032,300 *li* [100,016,150 km]. The distance from south to north is shortened by 1,000 *li*; whereas the distance from east to west is lengthened by 1,000 *li*. The entire space is measured using the armillary sphere as the instrument. The way to check this number is to use two right triangles. The shadow of the gnomon faces the heavens and explains the meaning of the spheres celestial and terrestrial. The calculation is based on the fact that shifting the gnomon a thousand *li* north-south causes a difference of one *cun* (in the shadow of the Earth).[12]
>
> (*Jing Dian Ji Lin* [*Ling Xian*])

It is clear that Zhang Heng exhibits logical reasoning (mathematics) when describing his model, as he includes the dimensions of heaven, method of measurement (armillary sphere), and ways to verify said measurement (applying the Pythagorean theorem on two right triangles). However, the purpose of Zhang Heng's logical reasoning (mathematics) is fundamentally different from Aristotle's: Zhang Heng's calculations are used to contextualize the model, not to prove that his model is correct. Since, Zhang Heng considers the Taoist metaphysical beliefs to be sufficient justification of his model, he merely applies these calculations to his presupposed argument, making it impossible for his logical reasoning to disprove his beliefs. Thus, unlike Aristotle, Zhang Heng's use of logical reasoning does not justify his model, but merely endorses and corroborates it.

3.3 Heaven and Earth Being in the Same System vs Heaven and Earth Being in Separate Systems

Aristotle believed that heaven revolves around a stationary Earth while Zhang Heng believed heaven revolves around the Northern star. This is because while Aristotle considers heaven and Earth to be part of the same system, since this view is supported by empirical evidence and deductive reasoning, Zhang Heng believes — owing to his metaphysical beliefs — that while earth and heaven do interact and correspond with each other, they are nevertheless not part of the same system.

Aristotle proposes his argument in order to deny the notion that Earth moves in a circular motion:

> Secondly, all the bodies which move with the circular movement are observed to lag behind and to move with more than one motion, with the exception of the primary sphere: the Earth, therefore, must have a similar double motion whether it moves around the centre or as situated at it. But if this were so, there would have to be passings and turnings of the fixed stars. Yet these are not observed to take place: the same stars always rise and set at the same places on Earth.
>
> (Arist. *De caelo*, II.14. [Guthrie Trans.])

This argument has the following structure:

Premise 1: If Earth moves, it must also have double motion.

Premise 2 (empirical evidence): If this were so, our position relative to the stars would shift, causing the stars to rise and set at different places, which is not observed.

Conclusion: Earth is stationary and does not move in a circle.

As seen from this reconstruction, this argument is valid but not sound. Below is the structure of the argument:

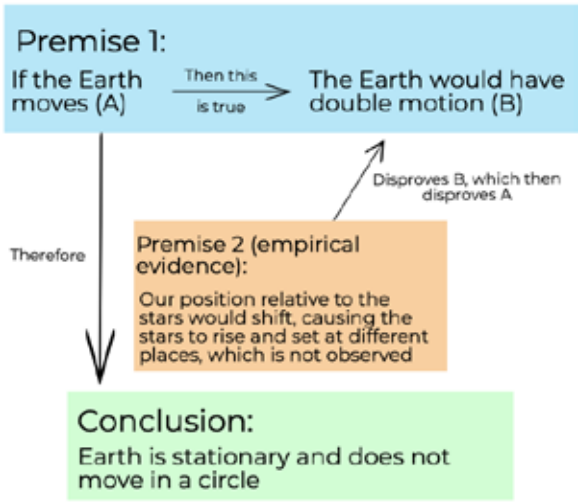

Figure 7. Flowchart of Aristotle's Argument

[12] Translated by Needham

Let statement A be that the Earth moves and statement B be the double motion. In Premise 1, Aristotle states that if statement A is true, statement B must also be true. He then uses the empirical evidence (Premise 2) as a means to prove that statement B is false, hence proving statement A is false. Thus, the conclusion Aristotle reaches is valid.

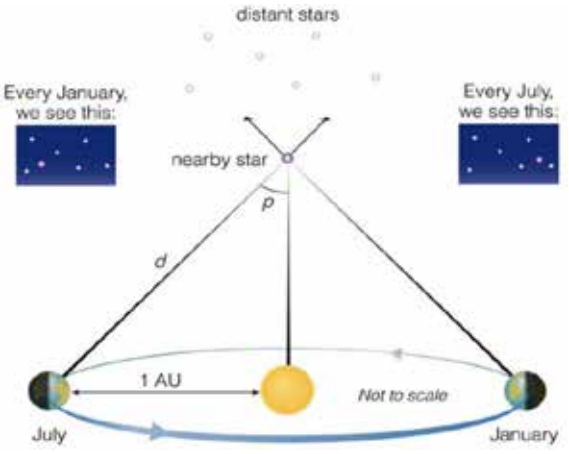

Figure 8. Diagram of stellar parallax. As the Earth moves to different positions in its orbit, the position of stars relative to ours would shift (shown as the pink dot) (*"The Stars" AST 101: The Stars, www.astro.sunysb.edu/fwalter/AST101/stars.html.)*

However, Aristotle's argument is not sound. Aristotle attempts to justify the soundness of his argument by stating that if bodies move in a circular motion, they would lag behind and move in more than one motion (Premise 1), which would result in the shift of the positions of nearby stars, also known as stellar parallax (Premise 2) (Figure 8). However, his justification is constructed on an incorrect basis. This is due to the technological limitations of that time. As the stars are very far away from Earth, the parallax would be so minute that a high-quality telescope would be needed to observe it, which is something the Greeks did not have. Therefore, Aristotle wrongly observed that the parallax did not take place, causing him to arrive at the wrong conclusion. Despite this, it is clear that Aristotle used deductive reasoning to reach his conclusion.

Furthermore, Aristotle's belief that everything would fall to the centre of the universe is worthy of some consideration. This is because in Aristotelian physics heavier elements like earth and water tended to move towards the centre of the universe where the vortex is.[13] Thus, even though it is false, it is clear that Aristotle's view of Earth lying in the centre of the universe, with heaven revolving around Earth is constructed on a purely logical basis.

A possible rebuttal could be that Aristotle does not always employ logical reasoning and occasionally relies on the supernatural realm for answers. For instance, when explaining the reason behind circular motion, he turns to theological justifications:

> Now since there exists no circular motion which is the opposite of another, the question must be asked why there are several different revolutions, although we are far removed from the objects of our attempted inquiry, not in the obvious sense of distance in space, but rather because very few of their attributes are perceptible to our sense…The activity of a god is immortality, that is, eternal life. Necessarily, therefore, the divine must be in eternal motion. And since the heaven is of this nature (*i.e.* is a divine body), that is why it has a circular body, which by nature moves forever in a circle.
>
> (Arist. *De caelo* II.3. [Guthrie Trans.])

However, it is also important to note that when Aristotle mentions "god", he is not referring to a Greek deity, but rather to the 'prime mover' (a force that moves celestial bodies in the universe without being moved).[14] Since, according to Aristotle, it is impossible for an object to move without something moving it, the only logical way to explain the motion of celestial bodies is to resort to the existence of an invisible force that can move objects without being moved itself (*i.e.* the prime mover ["god"]).[15] Furthermore, given that there was no feasible way for anyone at that time to explain the reason behind the circular motion of heaven due to the limitations of technology, it is important to acknowledge that the assumption of a prime mover ("god") is the most logical approach Aristotle could have had recourse to.

Conversely, in Zhang Heng's cosmological model, the earth and heaven are different systems and heaven rotates around the North Star.

[13] See Guthrie's translation of Aristotle's *De Caelo* Book 2, Chapter 13.
[14] See Hope's translation of Aristotle's *Metaphysics* Book 12, Chapter 8.
[15] See Hope's translation of Aristotle's *Metaphysics* book 11, Chapter 6

天有兩儀，以儛道中。其可覩，樞星是也，謂之北極。

《經典集林・靈憲》

In heaven the two symbols (sun and moon) dance around in the line of the ecliptic, encircling the pole star (the Northern star) at the North pole.

(*Jing Dian Ji Lin* [*Ling Xian*])

[Needham Trans.]

Figure 9. A star trail image which shows the stars encircling the North star. (*Allexxander. "4k Star Trails Stunning Cosmos Stock Footage Video (100% Royalty-Free) 19633303." Shutterstock, www.shutterstock.com/video/clip-19633303-4k-star-trails-stunning-cosmos-polaris-north.*)

As seen in the image above, the positions of the surrounding stars revolve around a central point: the North star (Figure. 9). Thus, Zhang Heng's claim is supported by empirical observations. However, this concept may not only originate from observations but also metaphysical beliefs. For instance, the Northern star, known as *Tai Yi* 太一, symbolizes the emperor of heaven *Tian Di* 天帝 [the supreme ruler] since all the other stars revolve around it[16]. This is because the concept of 'heaven' in ancient China is not completely removed from religion, so ancient Chinese philosophers did not view heaven and god as completely separate entities. In addition, from Zhang Heng's exclusion of Earth from the description of heaven's revolution, it's reasonable to infer that earth and heaven are considered as two different systems.

The relationship between heaven and Earth in Zhang Heng's model builds on the Taoist concept below:

老子曰：人法地，地法天，天法道，道法自然。

《道德經》

Lao Zi says: "Humans follow Earth, Earth follows heaven, heaven follows Tao, and Tao follows nature."

(*Tao Te Ching* 道德經 [*The Book of the Way and its Virtue*])

Regarding the belief that earth follows heaven, this is explained by the fact that the changing of the seasons is what enables life on earth to grow, which therefore implies that life on earth is contingent on heaven. Hence, earth is regarded as having a lower status than heaven.

This belief is evident in the following quote:

天以順動，不失其中，則四序順至，寒暑不忒，致生有節，故品物用生。地以靈靜，作合承天，清化致養，四時而後育，故品物用成。

《經典集林・靈憲》

"Heaven moves orderly and never loses its centre; then the four seasons succeed each other regularly, the cold and warm periods stay constant, leading to the birth of all living beings with regularity. Therefore, all things are born. Earth stays stationary with divine power. It acts harmoniously to respond to Heaven. It cleanses and transforms to provide nourishment. With four seasons proceeding, it nurtures everything. Therefore, all things grow to maturity."

(*Jing Dian Ji Lin* [*Ling Xian*]*)*

[Lien Trans.]

This extract displays the Taoist belief regarding the relationship between heaven and earth. Heaven moves orderly around a centre while earth stays stationary. Heaven leads, while earth follows. Heaven gives life to all living beings, while earth nurtures them. From here, we can see the subordinating position of earth with regards to heaven as well as the metaphysical influence behind such beliefs.

Concerning Aristotle's and Zhang Heng's differing theories about the relationship between Earth and heaven, their respective ways of describing the shape of the Earth (either spherical or flat) may also be a factor. As Aristotle believed the Earth, as well as all other celestial bodies, had the same shape and existed within a spherical boundary, this made it natural for

[16] See Shi Ji: Tian Guan Shu 史記：天官書

him to integrate Earth as a part of heaven. However, since Zhang Heng believed earth (the land) is flat, which is different from other spherical celestial bodies, it was harder to establish the similarity between other celestial bodies and earth, making it harder to integrate earth as part of heaven.

Conclusion

In conclusion, I have argued that Aristotle mainly uses deductive reasoning based on empirical evidence to derive his spherical Earth model, while Zhang Heng's *Hun Tian* model is based on metaphysical beliefs, only occasionally supported with logical reasoning. This conclusion is based on the following key findings. Firstly, both Aristotle and Zhang Heng make invalid assumptions about the symmetry of their models. This is an interesting point of comparison because it reveals an instance where Aristotle does not abide by his usual rigour of deductive reasoning. Secondly, although both philosophers do apply logical reasoning (in this instance mathematics), Aristotle uses it to derive his model, while Zhang Heng uses it merely to augment what are essentially metaphysical justifications. Lastly, Aristotle mainly relies on empirical evidence and deductive reasoning to deduce that heaven revolves around a stationary Earth and only turns to religious beliefs as a last resort due to the limitations of technological advances at the time. On the contrary, due primarily to his Taoist beliefs, Zhang Heng considers heaven and earth to be two separate systems, therefore believing that heaven orbits the North Star.

Possible Areas of Further Enquiry

These findings open up many further opportunities for reflection on why ancient Chinese philosophy has a metaphysical framework as a starting point to explain natural phenomena, while ancient Greek philosophy uses deductive reasoning based on empirical evidence to arrive at a framework.

This fundamental difference could be explained by how ancient Chinese philosophy aims to adapt to nature, while Greek philosophy aims to understand nature. The core principles of Taoism, such as "returning to nature" (道法自然) and "the unity of heaven and man" (天人合一) all preach the importance of harmony between humans and nature. As these beliefs form the basis of ancient Chinese philosophy, ancient Chinese philosophers would be less prone to questioning the reason behind natural occurrences and more content with using nature as a starting point to work from. Therefore, ancient Chinese philosophers would be less likely to attempt to develop their own understanding of nature outside of the pre-existing ideologies. However, due to the more limited nature of Greek religion, Greek philosophy inherited no such conceptual framework of what nature was, making an attempt to understand nature a primary goal of enquiry. For instance, Aristotle's formulation of formal logic is a tool to help philosophers understand the true nature of the natural world. Thus, unlike ancient Chinese philosophers, ancient Greek philosophers are by nature more likely to use deductive reasoning and challenge pre-existing frameworks. This difference in focus could be developed to explain why ancient Greek culture developed deductive reasoning, while ancient Chinese culture did not.

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The Industrialisation of Night Soil Transportation in Treaty Port China in the Mid-19th Century

Christopher H. Qian

Introduction

In the 17th century, a writer known as Master of Zhuoyuan Pavilion [酌元亭主人] wrote a collection of vernacular short stories entitled *The World-Enlightening Goblet* [*Zhao Shi Bei* 照世盃]. The last chapter told the story of a "Gentleman Mu" [*Mu Taigong* 穆太公]. Mu discovered that he could set up a public toilet free of charge and sell the feces — of high demand as a fertilizer — collected to nearby farmers. This idea eventually made him the richest man in his village (*Master Of Zhuoyuan Pavillion*).

Public toilets are merit goods: a product that the public should have based on need rather than ability and willingness to pay because it benefits not only themselves but also others. However, it costs money to build and to maintain the toilets, which the builders must finance. This forces the builders of the toilets to either charge their customers or to not build these toilets at all. Due to the additional charge using for using toilets, their scarcity and the fact that using toilets was not a social norm, people could opt to simply defecate on the streets (sources even recorded instances of government officials doing so!) (Yang 3). This was not only unpleasant to smell and see, but also facilitated the spread of infectious diseases. The situation above is a type of market failure: Merit goods are often under-consumed in the free market either due to lack of awareness or under-valuing the good. However, Gentleman Mu essentially found a solution to this economic conundrum. Instead of charging customers to use the toilets, he sold their excrement for money which brought upon a significant return on investment for himself. At the same time, his system allowed him to provide this merit good free of charge, increasing the number of toilet users and generating what is known as "positive externalities" for all, that is, the cleanliness of the streets.

Although the story of Gentleman Mu itself was most likely fictitious, the very fact that was written suggests that this business model was most likely already in use. More than a sanitary solution, his system exemplified the Chinese farmers' deep-rooted culture of repurposing human and animal waste as fertilizer for over 2000 years (Worster 27).

As an agrarian country with over 4000 years of history, the soil would have surely been depleted of its nutrients (China.org.cn). When fertilizing options ran short, farmers turned to night soil. Night soil facilitates plant growth by replenishing the soil with nutrients such as nitrogen, potassium and phosphorus (Lory *et al*.). The demand for night soil vastly improved the cleanliness of the countryside as few people were willing to waste this valuable resource. The use of night soil reached its peak during the Ming and Qing Dynasties, especially in the prosperous Jiangnan region in the South of China (Xue 41-71). Demand for night soil still exists in modern society: Recently, North Korean farmers have, reportedly, been stealing each other's night soil to compensate for their fertilizer shortage. In America, a Harvard economics professor was detained after he was caught stealing a truckload of manure with which he planned to fertilize his garden with (Lockie).

With China's growing prosperity, people moved far away from the farmlands and settled in cities. This urbanization created an issue which some historians have identified as a "metabolic rift": in the city, residents viewed night soil as nothing more than waste and disposed of it far away from farmlands that so desperately needed it (Worster 31-32). Gentleman Mu's model of fertilizing the soil with local consumers of the waste was no longer enough to properly fertilize the soil. This problem was worsened when treaty ports were established in China during the mid 19th century

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and the newly created trading centers attracted massive migration. These migrant workers lived crammed in slums with next to no sanitary facilities. The arriving foreign health officials were appalled by the state of the country's urban sanitation. They were shocked that toilets were emptied onto the streets, and only when filled to the brim; that people were openly defecating in public areas; and that the business of restaurants in close proximity to germ-infested public toilets flourished. The heinous sanitation conditions led health officials to conclude that the Chinese simply did not care about sanitation (Zhu 83-84).

To combat this issue, the sanitation officials adopted a waste management system similar to the one popular in the South China. Indeed, since the beginning of the "metabolic rift" in China, the need to keep cities clean and the growing demand for fertilizer have opened up opportunities for some shrewd businessmen to profit. They implemented public toilets similar to Gentleman Mu's in cities, searched the city scraping up waste anywhere they could find it, and sold the cities' night soil back to farmers. This system was already prominent in the Jiangnan region in the south of China (Zhu 30); yet authorities in treaty ports and colonies made it into a large industry licensed and regulated by the government.

This essay will be divided into four subsections. Section 1 will analyze the methods used in foreign concessions in Shanghai to dispose of night soil (manure collected at night in buckets); section 2 will explore how the Japanese colony in Taiwan disposed of their night soil; section 3 will compare the advantages and disadvantages of each system in its respective order and the final section will discuss the relevance of the historical model in solving modern waste problems.

1. Concessions in Shanghai

Before explaining how concessions dealt with their night soil in Shanghai, it is important to first understand the different legislative entities that governed the Shanghai concessions. After the signing of the Treaty of Nanking on September 21st 1842, the English established their concession in Shanghai, followed by the Americans six years later. In 1849, the French entered Shanghai and established their own concession. To cater to the joint benefits of the three concessions, the countries set up the Shanghai Municipal Council (SMC) in 1854. However, the French decided to withdraw from the SMC and set up an autonomous French concession in 1862. Just a year later, the British and Americans decided to merge their land into one big concession. The concessions were designed to be enclaves for the settlers that restricted the entrance of locals in order to quarantine themselves from the deadly diseases that they bore (Zhu 85). The information that I have collected mainly pertains to the Anglo-American concession and the SMC.

The main motive for revamping the night soil disposal system in Shanghai was to adapt the environment to the western style of living. The first problem encountered by the settlers were the lack of public toilets up to western sanitation standards. Therefore, the SMC started construction on the first of many "modern" public toilets in 1864 (Jin). That same year, the concessions in Shanghai adopted a joint contracting system for the disposal of all of the concession's waste. The contractor was responsible for transporting all the waste of the day away between 7am to 8pm for a small fee (Peng 60).

Until then, the SMC had not realized that night soil was a highly sought-after fertilizer used by Chinese farmers. Upon discovery of the lucrative night soil market in 1864, the SMC began disposing the concession's general waste and night soil separately. On June 7th, the SMC charged their then-contractor, Deng Kunhe, 505 silver dollars per month to retain his rights of transporting the night soil (Peng 59). The industry was so profitable that by 1909, the contracting position was auctioned off to Zhu Zhihua 朱之華 for 7500 silver dollars in an auction of forty-six bidders (Peng 263).

Though profitable for the government, this night soil disposal system caused a multitude of other problems. Contractors, in order to maximize profits, did not provide buckets to their workers. The workers were allowed to use regularly spilling old wood buckets. Although the streets had become free of the dumping of night soil by residents, the faulty buckets had caused much of the collected night soil to leak onto the streets, undermining the main purpose of the night soil disposal system. To combat this issue, in 1869, the SMC required their contractor to replace their current transport tools with lidded buckets, which reduced spillage significantly. In the 1890s, the French Concession invented a new type of transportation tool for night soil that bore a close resemblance to a metal wheelbarrow (Peng 263). These tools had a much larger volume and were far sturdier than the wooden buckets used prior to its invention. However, the tool has a design flaw which required its operator to hold it with both hands to prevent it from tipping over. Consequently, residents were made to pour their own refuse into the wheelbarrow. Due to the height of the

barrow and poor strength of the women (maids or housewives) responsible for pouring the waste, spillages were a common occurrence. Additionally, the size of the barrows prevented operators from entering narrow alleyways. This was especially problematic in China, where many lived in these narrow alleyways. Residents were forced to dispose of their own waste, and often resorted to dumping it on the streets.

It is unclear whether the concessions discovered a way to solve this issue. Though the first flushing toilet was developed in 1891, the sewage system was not mature enough for it, in the Shanghai concessions. The governing bodies of the Shanghai concessions continued to develop the wheelbarrow transportation technology, eventually creating mechanized wheelbarrows in 1919. These wheelbarrows were much more efficient and made the transportation of night soil much faster (Peng 251-261).

Another problem linked to the establishment of this night soil disposal system is that of the workers' work ethics. The workers who were paid poorly in a job which offered no incentive to work harder, often did the minimum to satisfy their employers. Workers often secretly dumped some night soil lighten their load, and often threatened not to collect the night soil of select residents unless they paid a bribe (Peng 118). These two practices were eventually outlawed in legislature passed in 1946, known as the Shanghai Municipal Public Health Service Bureau Night Soil Transport Worker Misconduct Penalty. However, it is not clear if this piece of legislature really kept workers from misconduct.

2. The Japanese Colonial Methods

Taiwan was colonized by Japan in 1895 as a result of the signing of the treaty of Shimonoseki. Japan was a nation undergoing rapid modernization as part of the Meji restoration, embracing western ideals. The Japanese thought the Taiwanese sanitary condition was an insult to their "modernized" regime. When the Japanese first arrived in Taiwan in 1895 (fifty-three years after the establishment of foreign concessions in Shanghai), they were shocked to see Taiwanese natives openly defecating on the streets. The few public toilets around were wooden buckets carelessly left by farmers who needed fertilizer for their crops. The Japanese colonizers acted quickly, and within two years had set up a contracting policy for the transportation of feces, and had erected twelve public toilets in Taipei City (in 1910, these toilets were upgraded: complete with taps, electric lighting and brick walls) (Zhongxuesheng Wangzhan). In 1908, the Japanese government created a law forbidding residents from defecating on the ground, offenders being subject to fifteen days in prison and a maximum fine of ten *yen* (Dong 26).

Though efficient in establishing the night soil disposal system, the Japanese system was by no means perfect. In Taiwan, it was the job of the local sanitation groups [衛生組] — a subgroup of the Plague Preventions Group [防疫組合] — of each region to auction the night soil collection contract. However, the contractors negotiated collection prices with individual residents illegally, which was much cheaper than buying the government's contract. These illicit deals had already split the rights of night soil transportation among contractors. As a result, the official government-issued rights were of no use and often sold for little or nothing to small groups of transport workers; unsold contracts were passed on to Fertilizer Societies [肥料社會] for free. The primary reason the sanitation groups were so weak was due to the sheer number of them: each in charge of a tiny pocket of land, the governing power was extremely dispersed and hard to manage. Because the contractors made private deals with residents, it was hard for the government to track them. Thus, the contractors were not subject to regulation that could protect the residents and the general sanitation of Taiwan.

Because of the various issues with the sanitation groups in their old waste management system, the Japanese colonial government reformed it in 1916. The responsibility to sell contracting positions was assumed by the Plague Preventions Group [防疫組合] which were far larger than the sanitation groups (Dong 41). The groups had far more resources at their disposal, and increased the government's grasp on night soil transporting rights, allowing them to easily regulate the contractor's behaviour. The contracts were sold off based on the predicted price of manure, city per city. In this new system, contractors were only allowed to charge an extra fee from residents if they lived in hard to reach areas such as in some regions of Keelung (Dong 41).

Though chaotic, the original contracting policy mentioned above allowed smaller contracting agencies or groups of workers to afford the rights of collection in a small region. When the Plague Preventions Group took over and auctioned the contract city by city, the poorer contractors who used to be able to buy the rights in a small area could no longer afford them. As only large corporations could afford the contracts, they sold small areas of a contract they had won to poorer contractors or workers for a significant mark-up (Dong

42). This business was so lucrative that in 1919 two companies, Tai Cheng Fertilizers Co Ltd [大正肥料株式社] and Kao Sha Company [高砂公司], bribed the head of the Plague Prevention Group in order to secure their rights as contractor (Dong 42). The new system, though more effective in regulating the contractor's actions and in generating revenue for the government, paved the way for many other issues.

An issue that immediately arose with the contracting system was extremely similar to the issue in Shanghai — the spillage from leaking buckets. Because contractors outsourced the real transportation to other poorer contractors or laborers, they had already made all their money, giving them no incentive to supply the workers they outsourced to with buckets. The workers themselves were poor and could not afford to buy new equipment, especially since there was no clear incentive to do so. This issue undermined the main objective of the system to keep the city clean.

In response the decrease in sanitation, in 1909 the Japanese government issued a law known as the "Regulation Concerning the Prohibition of Night Soil Transportation Containers and Collection Containers" [屎尿搬運容器及汲取容器取締規則], which obligated transport workers to use lidded buckets which were both leak- and stench-proof, and stated that all collection equipment must be wrapped when not in use. Any transport equipment that did not fulfill the requirements would have its license revoked, while workers not wrapping their equipment were subject to a fine and jail time (Dong 42).

Due to a lack of prior planning, the newly required leak -and stench- proof buckets could not be manufactured quickly enough to supply one thousand-or-so workers with three buckets each — the usual amount the average worker carried. Additionally, the price of the buckets was three times the price of the old wooden buckets on the marketplace (new buckets cost one dollar and thirty five cents, compared to forty cents for each old bucket) (Dong 43-44). Since most of the workers in the night soil transporting profession were impecunious, paying three times what they had previous been paying made no economic sense. Many workers had no choice but to stick with their old buckets. The Government, understanding the workers' predicament and the potential strike if the law became too strict, decided to become more lenient in their approach and revise the law.

Another issue that arose was the negligence towards public sanitation by the night soil transporters. On rainy days, farmers usually did not fertilize their crops, which greatly reduced the demand of night soil. Transport workers, who made money from selling the collected night soil, had no incentive to work because the night soil wouldn't sell for much, if at all. This resulted in the overflowing of night soil in the homes of residents. As a result, streets were littered with uncollected night soil that residents were forced to dump. Some unfortunate workers who had already collected but could not sell their night soil would just dump it into a nearby lake or river. This was a serious health hazard as a contaminated water source could accelerate the spread of many infectious diseases. In contrast, on days when fertilizer demand was high, workers would sometimes impersonate other transport workers in order to steal the night soil in another worker's "territory", often causing quarrels (Dong 44-46).

The night soil industry became extremely organized, and night soil was split into five tiers. The tiers were differentiated by the night soil's origin, the wealthier the "producer" the more expensive the night soil, probably due to the higher nutritional value it harbors. The tiers ordered from best to worst were: *shiro koe* [お城肥], or "Castle Fertilizer", excreted by the *Ojyojo, Shogunate* Army or the *Ōoku*; the next level was called *kinban koe* 勤番肥, "Diligent Indigenous" fertilizer, from the excrement of workers of the Lord of Edo. Then came *machi koe* 町肥, "Farm Fertilizer", collected from public toilets used by farmers. *Tsuji koe* 辻肥, or "Street Fertilizer", as the name suggests was collected from public toilets beside the streets. It was less-valued due to the larger amounts of urine as opposed to feces. The least appreciated night soil was *yashiki koe* 屋敷肥, or "House Fertilizer", which was excreted by prisoners who were often malnourished. The price of these different tiers varied drastically. For instance, around 25 kilograms of "Diligent Indigenous" was worth 4 to 5 times the price of 25 kilograms of "Farm Fertilizer" (Cai).

Due to the outbreak of typhoid in the 1920s, the Japanese colonial government decided to properly sterilize night soil before usage with two new inventions: an early version of septic tanks in 1928 and automatic night soil treating toilets (Dong 52).

The first two septic tanks were located in *Churon* [中崙] and *Yumei Machi* [有名町] (Gao 4). These septic tanks were more like septic "pits". They were operated by workers who dumped large amounts of night soil into the pit and sterilized it with a disinfectant. These "pits" eventually lost state funding in 1931, and the Japanese government decided to charge 0.85% more tax to the citizens to maintain these

systems (Gao 4). The Japanese built a total of five septic tanks during their reign over Taiwan. The other three were located at "Green Farm" [綠町]，"Big Bamboo Surroundings" [大竹圍] , and "Neutral Farm" [中和莊] (Gao 8).

The automatic night soil treatment toilets, as the name suggests, were toilets that automatically treated waste. Under the toilet, there are 5 compartments that the night soil must flow through before it is safe to use (Dong 26). As the waste accumulates in the compartments, it breaks down and kills off any harmful bacteria and parasites (Dong 26). When enough accumulates in the first compartment, it flows into the second, then the third and so on. Usually, the waste reaches the fifth compartment after four to five months when it is ready to be collected (Dong 26). These toilets were a big upgrade from traditional toilets because it needed to be cleaned far less frequently and the waste inside was already sterilized, making it safer to transport.

3. Shanghai and Taiwan Compared

Though there were differences between the night soil disposal system in Japanese-occupied Taiwan and the system in the Shanghai concessions, they both had their advantages and disadvantages. As Taiwan was a colony, the Japanese occupied the whole of Taiwan and thus lived in tandem with the locals. The concessions, on the other hand, were relatively small enclaves surrounded by the rest of Shanghai. Thus, the settlers in these concessions did not have to live together with locals. The two main differences between the colony and the concession was of their demographics and geography.

The demographics of the colony and concession had an impact on the speed of which the government passed legislation. Possibly due to the large number of locals with a lack of sanitary awareness in Taiwan, the Japanese had to act quickly to maintain the sanitation standards that they had been accustomed to. Just thirteen years after their arrival, the Japanese colonial government passed a law forbidding public defecation. The concessions in Shanghai, on the other hand, had far fewer locals and the law was not necessary until the Chinese population expanded: concessions only adopted such a law in 1927, 85 years after the signing of the Treaty of Nanking (Dong 118).

Geography, on the other hand, affected the government's policy on the sterilization of night soil. Because the concessions were surrounded by the rest of Shanghai, they were able to simply sell the night soil to farmers outside the concessions. It was the farmers' responsibility to then treat the night soil themselves. Because the concessions did not care about sanitary standards outside of their concession, there was no need to build septic tanks for treating the waste as it was used outside the concession. Unlike the concessions in Shanghai, Taiwan was completely colonized by Japan and surrounded by ocean. Exporting the night soil out of Taiwan would have been too expensive and arduous, so the night soil had to be used locally. To prevent diseases, the government had to spend more resources to fund the proper processing methods for the night soil. Though the treaty ports of Shanghai may have had an easier time dealing with night soil, the Japanese colonizers had developed a far more holistic night soil disposal system which would benefit Taiwan long after the departure of the Japanese.

Despite their differences, both the Japanese colony and the foreign concessions used private contractors to dispose of their colony/concession's night soil. A problem that was highlighted in both places was the private corporation's prioritization of corporate over public interests. Some examples include the use of older and cheaper equipment, and the pollution of the environment by illegally dumping unsold nightsoil. To protect the public, the Japanese colonial government and the legislators for the foreign concessions of Shanghai had very similar approaches, with two main similarities: improving transportation tools to reduce leakage, and creating laws that forbade many types of worker misconduct. The work of the legislators in both the concessions and the colonies created a system that not only benefited themselves, but also facilitated the development of sanitary awareness in the locals. The treaty ports' introduction of Western sanitary ideals had helped to build better sanitation systems in Shanghai, while the incorporation of the Japanese approach in Taiwan left a model for the Nationalist Party to follow when rebuilding Taiwan (Gao 6).

In Shanghai, a Chinese newspaper created by English merchant Ernest Major, known as *Shen Pao* [申報] reported on the cleanliness of the enclaves.

An article published in 1872 wrote ,

> In all Settlements in Shanghai, streets and roads are in good order, with stores and houses perfectly cleaned. Neither filth nor waste is allowed in sight; refuse and dirt aren't allowed to pile up in public places. Some sporadic cases of rubbish on the street are cleaned by hired cleaners. Officers and patrolmen maintain and monitor the sanitary

> conditions. Therefore it is not necessary to speed up and cover one's nose when passing my waste. One may always take one's time and maintain one's composure… in our cities, on the other hand, the foul smell and filthy environment makes such a drastic contrast. It is hard to measure the degree of difference between these two cities (Ki 63).

Along with the translation of Western health-related books such as *Civilisation, Chinese and Christian* by Ernst Faber, Chinese elites discovered the huge disparities between Western and Chinese sanitation standards (Ki 65). During this period, the idea of sanitation in China was completely revolutionized. The original meaning, *weisheng* 衛生, which directly translates to "protection of life", turned into the more materialistic idea of germ theory, which was first established in the 1860s (Science Museum Brought To Life). Facilitated by the transformation of the Chinese perception of sanitation and their loss of the first Sino-Japanese War against the far more hygienic Japanese, the Chinese believed that there was a direct causal link between a nation's sanitation standards and its strength. An article published by the *Oriental Magazine* [東方雜誌] in 1905 stated, "For thousands of years the government never recognized the crucial relationship between public health and the prosperity of the country…" (Ki 63). The Chinese government also took action as early as 1897 with the establishment of the Street Cleaning Bureau [清道组] that mimicked the methods of Japanese colony and the French concession in night soil disposal (Ki 65-66). Evident above, the concessions and the Japanese colony played a huge role in the eventual revolution of Chinese sanitation standards.

In the early years when the Chinese Nationalist Party fled to Taiwan, they discovered that much of the city's infrastructure - including old septic tanks and toilets - had been heavily damaged by the war. The departure of the Japanese had also caused the sanitation standards of the city to drop massively. In response, the government started to adopt the Japanese contracting method to dispose of the night soil in 1950 (Gao 6). In 1952, the Kuomintang government in Taiwan made plans for the construction of five septic tanks (Gao 6). In 1958, four of the pits had been finished, each processing up to three-thousand-two-hundred tons of night soil at once. Every day, the septic tanks produced one thousand tons of sterilized night soil, with three hundred to four hundred tons used by farmers. The rest of the night soil was then properly processed and disposed of safely (Gao 8). Furthermore, the government also started to plan the construction of a sewage system in 1956, which the Japanese colonial government had originally planned in the 1930s. As seen, the Japanese frameworks in maintaining the city's sanitary standards had profoundly impacted many projects of the new Taiwanese government.

The advent of the industrialization of night soil transportation in China can be heavily credited to influences from the West and Japan. As seen from the two case studies of Japanese rule on Taiwan and the British, American and French concessions in Shanghai, the leaders of the city went to great lengths to improve the sanitation of the region: countless new innovations like flushing toilets, fecal transportation wheelbarrows and septic tanks were all been adopted by the locals after their departure.

Conclusion

Despite all their differences, the colonial governments in Shanghai and Taiwan created similar business models to manage night soil. The business model was effective: not only was it profitable for the contractors and government, it was also a sustainable way to dispose of the pollutant night soil by repurposing it as a fertilizer, mending the metabolic rift described in Section 1. The sustainable cycle reduces the whole array of issues caused by human excrement and industrial fertilizers, including the pollution of waterways caused by both the night soil and by the excessive use of industrial fertilizers.

Today, the premodern feces transport system may seem outdated. However, there are many benefits that are exclusive to the premodern system as mentioned above. By assimilating the positive elements from the premodern waste management system, a better and more sustainable system suitable for the contemporary metropolis could be created.

One big flaw with the premodern waste treatment system was the crude transportation system that often led to a series of problems such as illegal waste disposal and spillage. Improvements in buckets and transporting devices such as the wheelbarrows in Shanghai and toilets that automatically treat the waste developed by the Japanese in Taiwan, have reduced the issues mentioned above. The modern sewage system can effectively recompense the issues plaguing the premodern system, eliminating both spillage and illegal waste dumping (Dong 58). Furthermore, modern technology enables us to convert night soil into fertilizer far more efficiently. In combining the premodern system with modern technology, we can

hope to get the best of both worlds: a sustainable system without the challenges that plagued the premodern system, while also greatly reducing costs of operation through profits from the fertilizer.

Though the issue regarding spillage and illegal waste dumping in the premodern system can be easily managed, the issue conceals a more profound flaw in the system when it is run privately. It begs the question of whether a system like the one described above should be operated by the public or private sector in order to ensure it always prioritizes the public interest over private gain. A balance between economic interests of the responsible party is essential in ensuring the longevity of the system while also maintaining impeccable public hygiene standards. As discussed, it is clear how much private companies prioritize private gain over public interest: transporters refusing to transport night soil on days it was hard to sell, dumping night soil illegally when unsold and using crude transport equipment causing spillage. Private corporations can be effective at running the system as long as their own interests converge with the public interest. However, when the corporations' interests are no longer aligned with the public's, they can pose a serious risk to the community.

A government-controlled system is held accountable by the voters, and should serve the interests of the society regardless of financial gain. Even if the government were to prioritize profits, the government would still be benefiting the public indirectly: a more profitable government enlarges the government's budget, which can be used to benefit society through a plethora of other channels, such as healthcare, education and welfare. However, the government would fall short when it comes to running the system efficiently: we have seen that the transporting equipment invented by the French concession failed, and the "Regulation Concerning the Prohibition of Night Soil Transportation Containers and Collection Containers" bill was essentially useless due to poor planning. In addition, the government can easily fall victim to corruption, as seen with the bribery case in Japan.

Exactly where to land on the spectrum of a free market to a command market is out of the scope of this paper, but no matter what management system is implemented, the benefits of a human waste repurposing system are undeniable. With the aid of modern technology and proper regulation, the human waste repurposing system can solve an array of issues caused by the use of industrial fertilizer and increasing amounts of human waste generated each day.

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蘇小小鬼魂形象的塑造手法及意義

李心儀

引言

中國文學中不乏歌詠著名女性形象的文學作品。蘇小小為較早出現的女性文學形象，在後代有著大量的關於她的作品。[1] 筆者統計了描寫蘇小小或其墓的詩詞，發現其中大部分都著重描寫了蘇小小的鬼魂形象。[2] 歷代文人以怎樣的藝術手法去塑造這一形象，而這些手法又表達了什麼意義？她為何受到眾多文人的追捧，成為經久不衰的創作題材呢？

目前，對蘇小小的研究[3]主要聚焦于蘇小小本身的形象，或者李賀的《蘇小小墓》，而針對其鬼魂形象的塑造及意義則尚未被深入探究。由此可見，現今研究中主要論述方向較為單一，雖然提供了統計資料，卻不能回答本文提出的疑問。本文將通過資料統計及文本細讀等研究手法去梳理歷代詩詞，總體歸納蘇小小詩詞的文學手法的特點，並從歷史性的視角縱向地去探究蘇小小形象的塑造手法的變化和繼承性。

本文將從「植物意象的使用」、「時節與天氣的氛圍營造」和「對比反差」這三個手法出發，並通過「如何塑造」及「為何塑造」兩方面作為切入點，去探究歷代文人使用何種手法去塑造蘇小小的形象，以及帶出了哪些深層含義。

一、植物意象的使用：多情生命的轉化

蘇小小詩詞的特別之處在於文人總會把蘇小小的鬼魂寄於植物意象中，以一種獨特的方式刻畫了蘇小小的鬼魂形象。其中有三種頻繁出現，在眾多植物意象中極為突出：松柏、幽蘭和芳草。

松柏常出現於描寫蘇小小的詩詞中，第一次出現于南朝梁代的詩集《玉台新詠》的《蘇小小歌》中：

> 妾乘油壁車，郎騎青驄馬。何處結同心，西陵松柏下。[4]

此詩的作者已無可考，但因此詩以蘇小小本人的口吻敘述了與戀人約會的美好情景，被後人視為創作原型，以此詩中的意象作為前文本而加以創作。松柏在墓地場景中暗指死亡，因松柏長青，歲歲年年如一日，便與死亡之永恆相契相合，突出了生命的短暫與虛無，讓讀者更容易聯想到魂魄、死亡等主題。如此為松柏解讀便能從《蘇小小歌》中讀出一絲鬼魅氣息：松柏本身帶有鬼氣，作為蘇小小墳旁的植物便更容易讓人聯想到早逝的蘇小小以松柏為化身的可能性。詩中叫情郎在松柏下送蘇小小「結同心」，可能暗示這蘇小小的靈魂轉化到了松柏上，如此才

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[1] 據姚可在《蘇小小形象流變研究》中的不完全統計，蘇小小的形象至少出現於三百一十四首詩詞及其他資料中。

[2] 筆者的統計並不完整，但收納的都是一些主要的、以蘇小小為中心的詩詞，不包括只是用蘇小作為意象的詩歌。在筆者統計的六十五首詩中便有四十一首探討了蘇小的鬼魂形象，占總數的百分之六十。

[3] 如姚可的《蘇小小形象流變研究》，她重點研究了中國文人的「戀妓情結」與「知己情懷」並探討了蘇小小的經典的悲劇性，但沒有聚焦于文學手法或蘇小的鬼魂形象。陶慶梅的《李賀〈蘇小小墓〉賞析》中點到了意象的重複運用以及「前文本」與「互文本」兩個概念，也寫到了文人會在描寫蘇小小時投射自己的情感，但這篇論文只聚焦了李賀的詩，並未做出總體性的研究。這兩篇論文外還有許多別的內容，但都不能回答本文中的問題，在此不一一舉例。

[4] 徐陵：《玉台新詠》（上海：上海古籍出版社，2013 年），卷十。

會有這樣的描寫。同時這種對於松柏的解讀也出現在許多後續作品中，如「西陵松柏雨瀟瀟」[5]，或「松柏西陵翠燭冷」[6]，這裡的松柏突出了詩詞中的死亡、鬼魅氣息，暗示了蘇小小化為植物的幽魂形象。

幽蘭也是詩中的一個重點母題意象，是唐代「詩鬼」李賀所做的《蘇小小歌》中第一次加入的：

幽蘭露，如啼眼。無物結同心，煙花不堪剪。[7]

詩中把柔弱的幽蘭比作蘇小小垂淚的雙眼，通過一株幽蘭想像蘇小小空靈的美麗、幽怨的情緒和執著的等待，更是以「幽」一字寄託了冥境的孤獨淒涼，又突出了蘇小小飄渺的鬼魅形象，可見幽蘭就是蘇小小的化身。蘭本喻隱士、君子和美人，代表出塵的氣質、高潔的品格和寂寥的生活，於此處被用來形容蘇小小的美好品格和寂寞孤單的處境。蘭之幽香清新且不張揚，與李賀想像中蘇小小的形象符合，因此常被用來作為化身的植物。幽蘭的獨特是因為在此帶入了文人對於蘇小小化身的幻想，如此成為經典，引發了後人的模仿與追捧，如明朝龔鼎孳在《羅敷媚•西陵吊蘇小二調》中寫到：

幽蘭泣露吹羅帶，月與身輕。芳草還生。薄幸斜陽看喚卿。[8]

清人周岸登在《憶瑤姬•蘇小墓，依梅溪體》中有：

松柏西陵翠燭冷，幽蘭露眼盈盈。[9]

芳草也是最頻繁出現的蘇小小化身的植物之一。芳草萋萋，帶有荒寂之感，暗指逝去的美好事物，在惋惜之際也帶出一絲傷春悲秋的憐惜之情以及物是人非的懷人之感，用來作為蘇小小的化身再適合不過。

明人徐陽輝的《蘇小墓》有：

春深花落迷孤墳，蔓草猶疑拂裙帶。[10]

無人看護的孤墳一片死寂，而生命力頑強的草卻一片生機勃勃，仿佛風華最盛時逝去的蘇小小一般，仍然癡癡地等待著情郎。以芳草寫幽魂是文人們常用的手法。「蔓草猶疑拂裙帶」以擬人帶出了動態，有如蘇小小的靈魂附在這株草上，無風自動，有了自己的意識。

清人徐大年有《西湖竹枝詞》：

可憐蘇小墳邊草，猶是含情怕杜鵑。[11]

草本無情，但在這首詩中卻以「含情」金水的形象出現，所以才說詩中的「墳邊草」是蘇小小的化身，將蘇小小多情的特質延續了下來。同時，「杜鵑啼血」的典故的運用也同樣暗示蘇小小的轉化：墳邊草若不是蘇小小的化身就不會「怕」杜鵑淒厲、哀怨的叫聲會勾起傷心往事。這樣的描寫也同樣為草帶來了靈動之氣，猶如蘇小小一般。于此詩歌化虛為實，以草的形象描寫了蘇小小的姿態，柔弱又幽怨。

清詩人朱彝尊的《梅花引•蘇小小墓》中有：

溪流飛遍紅襟鳥，橋頭生遍紅心草。[12]

紅心草自唐代王炎的《葬西施挽歌》就有著美人遺恨的典故，而在此更是代表了多情的蘇小小對人間的留戀，才會把自己轉化為紅心草仍等待著情郎。這種植物意象的使用讓蘇小小的鬼魂形象更加豐富，通過實體化一個虛無縹緲的形象，讓其更加真實、立體。草這一意象唐代到清代的文人都加以傳神運用，並被歷代文人化用。

綜上所述，文人常會把各類不同含義的植物意象（如松柏，幽蘭和草）和蘇小小的面孔或姿態聯繫到一起，暗示這些植物是蘇

[5] 徐陵：《玉台新詠》（上海：上海古籍出版社，2013 年），卷十。

[6] 周岸登：《憶瑤姬·蘇小墓，依梅溪體》，載《學衡》1922 年第十二期。

[7] 彭定求：《全唐詩》（北京：中華書局，1960 年），卷二十九，頁 422。

[8] 陳乃乾：《清名家詞》（上海：上海書店出版社，2016 年），頁 21。

[9] 周岸登：《憶瑤姬·蘇小墓，依梅溪體》，載《學衡》1922 年第十二期。

[10] 胡文學：《甬上耆舊詩》（杭州：杭州出版社，2003 年），卷二十九。

[11] 顧希佳：《西湖竹枝詞》（杭州：浙江文藝出版社，1983 年），頁 217。

[12] 葉恭綽：《全清詞鈔》（北京：中華書局，1982 年），頁 221。

小小多情鬼魂形象的轉化。蘇小小生前多才多情，因為早逝所以命不該絕，於是才會讓文人們覺得留戀人間的蘇小小的魂魄會轉化成植物，再次復活。

二、時節與天氣的氛圍營造：生命的凋零

文人常通過秋冬季的描寫來塑造詩詞中的鬼魂形象，但蘇小小詩詞中最常見季節卻是春天— 一個看似無理卻蘊含深意的選擇。蘇小小詩詞大多都以春日為背景，除了植物意象的運用還有對於春季天氣、時節的描寫，原因有二：「傷春」之感，和風雨之摧殘。由此帶出生命的凋零、早逝等死亡氣息的主題。

首先，春天綻放的花朵往往會令人聯想到生機，可在暮春時凋零的花卻又象徵了生命的短暫。春是在生死交接時分：春初花開、春暮花謝，花的生命無比短暫，不禁讓人聯想到了蘇小小的早逝。這樣一個季節符合人們對蘇小小的想像，同時結合了對於紅顏薄命的惋惜和對於易逝的美好的感歎。「十八年來墮世間。吹花嚼蕊弄冰弦。多情情寄阿誰邊。」

明人袁宏道在《西陵橋》中寫到：

昨日樹頭花，今朝陌上土。[13]

清人黃燮清在《高陽臺•蘇小小像，為如冠久觀察題》中有：

落花滿地滄桑淚，料蘼蕪、也化愁根。[14]

袁宏道的詩意較為直白，用「昨日」與「今朝」的對比，表達出了花短暫的壽命，並以「花」和「土」的對比，突顯出了美好人及事物的快速凋零。黃燮清的詩句也表達了相似的意思，以滿地的落花表達了蘇小小的短暫的生命。除此之外，還有「春深花落迷孤墳」[15]，「歌殘井畔桃花落」[16]，「才見開花又落花」[17] 等詩句也都描寫了春暮落花時的景象，這種如白駒過隙的，曇花一現般的美景，在短暫的時間內快速的開花、凋謝，就如早逝的蘇小小一般，不禁讓人聯想到這春季迅速凋零的花朵就是她本人了。

其次，春季的選擇離不開春天風雨的描寫：自古以來風雨「妒花」，總被視為花朵的摧殘者，無論是在孟浩然的《春曉》中或是在《紅樓夢》的《葬花吟》中寫到的「風刀霜劍嚴相逼」，都是如此。[18]

宋朝司馬槱在《黃金縷》中寫到[19]：

妾本錢塘江上住，花落花開，不管流年度。燕子銜將春色去，紗窗幾陣黃梅雨。[20]

清朱彝尊在《梅花引•蘇小小墓》中寫到：

雨初晴，雨初晴，寒食落花，青驄不忍行。[21]

清吳藻在《滿江紅西湖詠古十首 其十 西泠蘇小》中還有：

不斷雨和風，愁如海。[22]

在司馬槱的詞中，「春色」可被理解為春日欣欣向榮的花朵，但也可被理解為蘇小小年輕美好的生命。而「春色去」又代表了她的死亡，後半句中的「黃梅雨」更是為這一轉折添了幾分傷感；朱彝尊的《梅花引•蘇小小墓》將雨後的滿地殘花當成蘇小小的身軀，通過青驄馬不忍踐踏的描寫，也巧妙地表達了傷春之感。吳藻更是直抒胸臆，直接寫出了轉化成花的蘇小小面對風雨摧殘時的愁緒與無奈。這些詩句都寫到了風雨對於花朵的摧殘，疊加了一層荒涼的氣氛。春風春雨雖然在常人看來是溫和的，但對於已經化為花朵的蘇小小可謂是致命的，所以這些被風雨無情拍打而凋零的花朵，其實是在寫蘇

[13] 王榮初：《西湖詩詞選》（杭州：浙江人民出版社，1979年），頁 249-250

[14] 黃燮清：《倚晴樓詩餘》（上海：上海古籍出版社，2002年），卷二

[15] 胡文學：《甬上耆舊詩》（杭州：杭州出版社，2003年），卷二十九。

[16] 沈季友：《檇李詩系》，《欽定四庫全書》本，卷二十三。

[17] 凌雲翰：《柘軒集》，《欽定四庫全書》本，卷一。

[18] 曹雪芹：《紅樓夢》（北京：人民文學出版社，2008年），頁 382-383。

[19] 北宋《張耒集》中記載司馬槱夢中與蘇小相會，夢醒後便寫下了《黃金縷》。這首詩後來成為了典故，並引發了許多後人創作。

[20] 李漁：《樂府陽春白雪》（北京：北京圖書館出版社，2006年），卷四。

[21] 葉恭綽《全清詞鈔》（北京：中華書局，1982），頁 221。

[22] 冒俊：《林下雅音集》（清光緒十年刻本），卷一。

小小的愁緒與凋零，進一步反映了詩中死亡的主題。

詩詞中通過對春季時節、天氣的描寫表現出凋零的主題：暮春時凋零的花在象徵了生命的短暫的同時也讓人聯想到了蘇小小的紅顏薄命，而春風春雨對於花朵的摧殘也反映了傷春之感，突顯出了文人對於生命的脆弱與短暫的思考，不僅營造了氛圍還帶出了生命的凋零的主題。

三、對比反差：生死的思考

寫蘇小小的詩人常常喜歡通過對比來突出他們對生死的思考。蘇小小生前的門庭若市、熱鬧繁華的場景與死後的淒涼冷清形成鮮明的反差，而這種佳人已逝、昔日不在的懷古感傷之思，就成了許多詩歌的抒情重點。詩詞中的對比手法的運用可以大致歸為兩組：以墓地的生機對比蘇小小的死亡，和用人間的熱鬧場景對比鬼魅世界的孤苦伶仃。

如上文所述，詩人偏愛使用大量植物意象去描寫蘇小小的孤墳，從而體現出了蘇小小對於還魂的執著以及她執念之強。描寫生機勃勃的萬物不僅僅襯托出了她的癡情與堅強，還更加刻畫了她的鬼魂形象。第一部分研究這些意象是從化身的角度來看，但這些意象之間其實還存在對比關係：蘇小小墓地裡透著濃濃的死亡氣息，與春天重新綻放的花朵植物、人間的生機形成了強烈的反差，透出了物是人非的感慨的同時，將昔日美人與今日美景對立，同時強調了生命的美與脆弱。比如明馮小青在《拜蘇小小墓》寫到：

> 西泠芳草綺粼粼，內信傳來喚踏青。[23]

詩中的「踏青」已經為全詩鋪墊了春日生機勃勃的感覺，而詩人更是通過「綺粼粼」一詞，以清澈流水的閃映、蕩漾形容了芳草，通過突出草的光澤來寫其濃密的特質。而就是這種生機與蘇小小的死亡形成了極端對比，用人間的溫暖反襯荒墳的暗冷色調，同時刻畫了生命之鮮活與死亡之蕭索。其餘的例子還有「芳草萋萋滿墓門」[24]，「橋頭生遍紅心草」[25] 等，也都以「滿」或「生遍」這兩個動詞，描寫了墓地生機勃勃、長滿植物的景象。

第二組對比是以人間的熱鬧場景反襯幽冥世界的孤單寂寞。

> 清人吳藻在《滿江紅•西湖詠古十首·其十·西泠蘇小》有：
>
> 蘇小錢塘，想當日、煙花世界。西泠下、美人黃土，一杯千載。
>
> 垂柳樓臺歌舞歇，笑桃門巷滄桑改。葬秋墳、不斷雨和風，愁如海。[26]

文人通過同時描寫蘇小小的孤墳和她生前的繁華，讓人間的種種熱鬧場景反襯死後的孤寂，通過今昔相對的兩種情景突出蘇小小作為一縷幽魂的孤苦伶仃，是為懷古。蘇小小作為南齊的「錢塘第一名妓」自然有許多仰慕者，生前的居所自然是門庭若市、熱鬧非凡。然而在她不幸早逝後就逐漸被遺忘了，與上文的「煙花世界」形成了強烈的反差。

如此的反差不止出現在一處，比如「油壁車，斫為柴。青驄馬，自西來。昨日樹頭花，今朝陌上土」[27] 等詞句也都反映了這類對比反差手法使用後產生的藝術張力：當年的絕代佳人、美好的油壁香車也禁不住時間的摧殘，如今破敗不堪，再不復往日輝煌。

生機與死亡、繁華與落寞兩組對比蘊含了文人對生命的思考，在塑造蘇小小鬼魂形象的同時也表達出了佳人已逝、昔日不在的懷古感傷之思。這種極端對比強調了生命的美與脆弱，賦予了詩歌深度與哲理性的同時也加強了藝術張力。

結論

本文由蘇小小詩詞的梳理統計為切入點，研究了有關蘇小小文本中最獨特的一些手法，並分別討論了他們各自展現的意義。首先，

[23] 張岱：《西湖夢尋》（北京：北京出版社，2004 年），頁 180。

[24] 徐熥：《幔亭集》，《欽定四庫全書》本，卷十四。

[25] 葉恭綽《全清詞鈔》（北京：中華書局，1982），頁 221。

[26] 冒俊：《林下雅音集》（清光緒十年刻本），卷一。

[27] 王榮初：《西湖詩詞選》（杭州：浙江人民出版社，1979 年），頁 249-250。

文人在詩詞中常常將蘇小的鬼魂與植物意象聯繫在一起，展現了蘇小小的多情生命的轉化；其次，詩詞中通過對春季時節、天氣的運用營造了氛圍，並帶出了早逝與凋零等死亡主題，反映了文人對於生命的脆弱與短暫的思考；最後，蘇小小詩詞中常常突出生機與死亡、繁華與落寞的對比，營造了詩詞的張力，更表達了作者生死關係的思考。

蘇小小鬼魂形象獨特的塑造手法，不但賦予詩詞鮮明的文學特徵，也表達出了豐富的含義，因此吸引著歷代文人不停地嘗試這一題材的創作。

除了以上的原因以外，還可以從另外的角度去思考蘇小小成為一個經久不衰的創作題材的原因。首先，許多寫蘇小小的詩詞都是以懷古為題的，而懷古類詩歌的一大特點就是通過化用前文本、融合前人的詩句來形成互文本。這些重複出現的意象會形成一個獨特的「蘇小小意象群」，吸引文人墨客去繼續加入自己的想像，從而豐富蘇小小這一文學形象，讓這個文學母題不斷擴展。如前文所論，其中一個例子就是李賀的幽蘭意象。這個節點性意象的加入，對蘇小小類的詩歌十分重要，在進一步豐滿了蘇小小的形象之外也影響了後續許多文人的創作。再者，蘇小小本身作為一名多情而有才的青樓名妓也十分符合男性文人們的幻想，提供了一個讓他們投射感情的創作原型。蘇小小對情郎的苦苦等待與期盼更是提供了將她轉化為一縷幽魂的合理解釋，而這種對於生命的留戀更是有著獨特的吸引力。

蘇小小詩詞是個十分值得深究的領域。這篇論文是從總體上對蘇小小鬼魂塑造手法及其意義做出初步嘗試，而以上兩點仍有待進一步研究展開。

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What Can a Comparison Between Anicent Aristotelian and Cofucian Rhetoric Reveal about the Purpose of Rhetoric?

Clarisse Tsang

Introduction

Defined as the art of persuasive language and oratory technique, rhetoric has been a long-standing field of academia for millennia. Starting as an inherently political concept seeking to establish order, rhetoric matured into a more general practice that is used as a means of persuasion, discussion, and discourse. Well-known philosophers of the ancient world, including Aristotle (384-322BC) and Confucius (551-479BC), wrote extensively on the use of rhetoric and how it relates to moral virtue. Both were concerned with the possible exploitation and misuse of rhetoric, but disagreed as to the true purpose of the practice.

In this paper, I will address the importance of ethics in both ancient Greek and Chinese rhetoric, largely focusing on the works of Aristotle and Confucius. My comparative argument will first consider the historical development of rhetoric as the subject, then the attribute of a "good" rhetorician, and ultimately, it will consider the significance of moral sincerity in both ancient worlds. Through this comparison, I will argue that Confucian rhetoric centered on the speaker's moral sincerity, with the main purpose being to cultivate moral excellence in the individual. In contrast, Aristotelian rhetoric focused on the power of persuasion and the mere appearance of moral character.

When discussing 'rhetoric' in a comparative essay, it is important to remember that it is an inherently Western concept. No direct counterpart or translation in ancient Chinese culture exists. The closest equivalent in Chinese is *Xiu Ci Xue* 修辭學 — the general study of crafting words and speech — a concept deeply ingrained in ancient works of politics, ethics, and academia. For the purposes of this paper, *Xiu Ci Xue* will be used as a counterpoint to Greek rhetoric to evaluate their similarities and differences. Such an attempt to find technical points of analysis between such culturally distinct terms may prove difficult, thus this paper will be largely centered around the underlying virtue and purpose of rhetoric, hoping to reveal the foundational philosophical nature of rhetoric and the implications of such cultural differences.

1. What Is Rhetoric?

1.1 Rhetoric in Ancient Greece

The word "rhetoric" derives from the Greek *ῥήτωρ*, meaning rhetorician. The roots of rhetoric in the Western world can be traced to Greece, where philosophers and orators utilized rhetorical techniques and methods to persuade others. The study of rhetoric was thought to have started in Sicily during the 5th century BC amidst revolution, when the tyrannical ruling family, the Deinomenid, were overthrown (Hinks 63). As a result, democracy was established in Sicily, where judicial rhetoric and public speaking became critical in serving justice and defending oneself in the turbulent political climate (Kennedy 26). Most scholars agree that theories of rhetoric were later brought to Athens by the philosopher Gorgias, who integrated political rhetoric within daily life (Poulakos 35)

As democracy flourished in Athens, rhetoric became essential in the ecclesia, the popular Assembly. Athenian citizens congregated to publicly debate, discuss, or vote on varying political matters (Rapp 579). These democratic assemblies provided an opportunity for citizens to utilize public speaking in a political manner, requiring an extensive grasp of logic, argumentation, language, and delivery. Rhetoric thus became crucial for aspiring politicians and orators in Athens - a newly democratic society - where one's success and influence relied almost exclusively on one's dexterity to persuade and compel through speech (Gagarin 50).

Aristotle's treatise on rhetoric was perhaps the most influential in the development of the subject. He

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famously defined it as “the faculty of discovering the possible means of persuasion in reference to any subject” (Rhet.1359b10). In this work, Aristotle not only describes persuasion as the main function of rhetoric, but also highlights its versatility and possible application in all subjects. His theory rests on a tripartite distinction of persuasive means; ethos, pathos, and logos. Ethos is defined as a method to persuade through one’s moral character and credibility. The relationship between the audience and speaker is stressed, and it is the speaker’s ethos that provides a fundamental element of trust which is subsequently vital for successful persuasion. Pathos is the act of appealing to the emotions of the listeners. Here, Aristotle touches upon the psychological nature of rhetoric, and it is demonstrated that emotions have immense influence over our judgement. Finally, logos is the coherent, logical structure of any argument. These three pillars of persuasion are seen as crucial factors in delivering a successful speech.

Rhetoric continued to develop largely on the basis of Aristotelian theory and was further refined an ancient Rome by Cicero and Quintilian, who developed their own blueprint of persuasion (Chiron 90)

1.2 Rhetoric in Ancient China

The Chinese term for rhetoric - *Xiu Ci Xue* (修辭學) - originated from the ancient phrase *Xiu Ci* (修辭), the act of refining and embellishing words. The conceptualization of distinctive rhetorical practices began during the early Autumn and Spring period (春秋時期 771-476 BC), when philosophers would travel across the states, spreading their philosophical ideas and values, by employing rhetoric as a method of discourse and discussion.

During the Warring States period (戰國時期 475-223 BC), however, the kingdom’s ruling power under the Son of Heaven 天子 slowly shifted to a number of distinct feudatory princes 諸侯 who had been delegated kingdoms for their own rule. With this decentralization of power came diplomats that travelled between the kingdoms, facilitating communication by proposing military strategies, alliances and negotiations to the different princes. These frequent diplomatic exchanges spurred development of political rhetoric, as envoys harnessed literary eloquence and rhetorical devices to persuade princes of certain political arrangements, acting as advisers and consultants in strategic warfare (Song 56). These envoys ultimately became the first notable rhetoricians, including Gongsun Xue 公孫衍, Suqin 蘇秦 and Zhangyi 張儀 - and were referred to as the *Zong Heng Jia* 縱橫家 - a group that was collectively formed on the basis of political and rhetorical ideas. The Autumn and Spring and the Warring States period are collectively referred to as *Baijiazhengming* 百家爭鳴 - the expression and dispute between a hundred schools of thought — conveying the widespread, fertile growth of philosophical discourse that flourished in China at this time.

While the art of public speaking was never characterised as an individual subject in ancient China, academics nevertheless acknowledged a series of persuasive methods that resemble the study of rhetoric in ancient Greece. These practices include *ci*「辭」- the use of persuasive language for artistic effect, *shui*「說」- a type of political persuasion often done between advisers and rulers, *bian*「辯」- the distinction of two matters, particularly used in debate, and *wen*「文」- the use of official language and literature. These persuasive and argumentative techniques were common and often included in academic discussion, but were rarely addressed nor treated as a separate discipline, as in Greece.

Traditional Confucian values like *ren* 仁 (benevolence) from the ancient Holy Kings, Yao Shun, and Yu became crucial in *Xiu Ci Xue* and were used to model Confucius’s *junzi* 君子; a nobleman of benevolence, sincerity, and just reason. However, if rhetoricians did not adhere to Confucius’s values, they would be labelled as *wei junzi* 偽君子 or *xiao ren* 小人 - meaning “fake noblemen”. These men manipulated and corrupted political motivation through false, embellished words that went against all traditional values of virtue and nobility, which stressed one’s moral character and sincerity. The distinction between these two parties instigated infamous debates and philosophical disputes, as documented by historical texts including *Guo Yu* 國語 [The Discourse of the States] and *Zhan Guo Ce* 戰國策 [Strategies of the Warring States], which contain dialogues and anecdotes between rulers and various rhetoricians.

The theory and application of rhetoric blossomed in response to the politically and philosophically diverse environment of the time, building the foundations of rhetorical practices for millennia to come. Following the establishment of imperial China, the need for diplomats and military advisers between states lessened, and political rhetoric was never used as widely as during the Warring States Period. *Xiu Ci Xue* was instead largely employed in literature and poetic embellishment rather than in political use of persuasion (Crump 182). It remains a fundamental part of ancient Chinese thought, shaping traditional

methods of communication, academic fields, and political theory.

1.3 Comparison

Similar ideas of rhetoric were developed simultaneously during the 5th and 4th centuries BC in Athens and in China in turbulent political climates. The practice of rhetoric appeared naturally as a response to socio-political needs in society in order to effectively communicate and persuade - specifically in democratic Athens and the fractured states of the Autumn and Spring period. Rhetoric was not necessarily "invented" by a single philosopher, but the mere presence of the concept in both cultures seems to indicate a societal need for such argumentative and persuasive means of language.

The fact that in China *Xiu Ci Xue* was not conceived of as a separate subject in the way rhetoric was in Greece may reveal something about the respective values of these societies. It can be argued that the Chinese counterpart of rhetoric is more grounded in a philosophical approach to language, while Greek rhetoric is more firmly focused on its pragmatic purpose. Aristotle's logical-dialectical theory and varying devices for success contrast with the ancient Chinese's measure for persuasive success, namely moral character and sincerity. The contrast between the two views alludes to the intrinsic differences in the political, social, and philosophical aspects of each culture.

2. What Makes a "Good" Rhetorician?

Looking further into the works of Aristotle, Confucius, and *Xunzi*, it is clear that what makes a "good" rhetorician hinges very much on how the term "good" is defined, as well as how the purpose of rhetoric is understood.

2.1 The Centrality of *φρόνησις* in Aristotle's Philosophy

At the beginning of Book II of the Rhetoric, Aristotle states, "for the orator to produce conviction, three qualities are necessary: good sense (*phronêsis [φρόνησις]*), good virtue, and goodwill" (Rhet.1378a8). Firstly, Aristotle's use of the word *φρόνησις* is interesting, as it refers more broadly to practical wisdom, intelligence, and prudence (Lacewing). The concept of *φρόνησις* is encountered regularly in several of his works, including Nicomachean Ethics and the Rhetoric. The man who possesses *φρόνησις* acts responsibly, making wise judgements to achieve the most morally beneficial solution, "discerning what is best for all, while leading an argument with absolute truth and virtue" (Rowland and Womack 14).

2.2 The Centrality of *Junzi* 君子 in Confucian Studies

In Confucian studies of *Xiu Ci Xue*, the definition of a virtuous nobleman can be found in most ancient Chinese texts, particularly in the Analects《論語》, which mentions the *junzi* 君子 well over 100 times. In the Gongye Chang 公治長 chapter of the Analects, Confucius describes a *junzi* as: "one with four types of virtue: acting with modesty, respect towards those higher above and hard work in all matters, care and kindness towards the common people, and just work befitting for the nation." The *junzi* is the nobleman with high moral virtue who embodies all Confucian values and is highly significant to the ancient Chinese usage of rhetoric.

Central to the *junzi* is the virtue of "kindness" *ren* 仁, which is the most recurring and fundamental value held in Confucianism. Upholding *ren* was crucial in being a "good" rhetorician as is made clear from the following: "*junzis* appear among people to express loyalty to their superiors, they counsel and warn. A true *junzi* will never tire of practicing *ren*".

2.3 Comparison

The association of rhetoric with virtue by both thinkers makes for an interesting comparison between the values of the two cultures. Aristotle placed an emphasis on *phronêsis* - practical intelligence, which embodies the perfect union between practical intelligence and ethical motivation. On the other hand, while values of intelligence and wisdom are mentioned, ren is much more significant in studies of Confucianism, which emphasise the rhetorician's magnanimity and benevolence.

This difference can perhaps be attributed to the respective purposes of rhetoric and *Xiu Ci Xue*. While Aristotelian rhetoric was intended to persuade through technical proofs, Chinese rhetoric principally functioned to spread Confucian ideas such as *ren* through persuasive techniques. This difference of emphasis can also be linked to their respective definitions of "good" and how both figures - the *phrónimos* and *junzi* - reflect a need for such a figure in the political climate of their respective societies.

3. How Important is Sincerity in Rhetoric?

As discussed above, both thinkers seem to place an emphasis on the moral character of the orator himself. Upon further examination, it seems Aristotelian and Confucian approaches to rhetoric had contrasted in regard to the importance of authenticity in the rhetorician's moral character.

3.1 The Importance of Keeping Up Appearances in Aristotlelian Thought

In the Rhetoric, Aristotle states, "in deliberative oratory, it is more useful that the orator should appear to be of a certain character." (1377b52). Here, the use of "*φαίνω*" - "*phaeínō*", meaning "to appear" or to "bring to light" is interesting, as the emphasis is placed on "showing" a virtuous character rather than "being" one. His omission of the distinction between the two seems to suggest both would be equally effective for the speaker, or even that appearing to have a virtuous character was even more important than actually having one. This becomes more apparent in line 1367b9 of the Rhetoric: "We must also take into account the nature of our particular audience when making a speech if the audience esteems a given quality, we must say our hero has that quality". By working towards ethos and appealing to the audience through one's own character, Aristotle seems to assert that the orator's character can be chosen relative to the preferences of the audience. This statement brings the moral sincerity of the rhetorician into question; if the speaker picks and chooses a character to "appear" to be relative to the audience, how true and sincere can their intentions be?

Furthermore, in line 1377b of the Rhetoric, Aristotle affirms that the ideal rhetorician "should be thought to entertain the right feelings towards his hearers." Here, the use of "entertain" is notable, as it portrays rhetoric as a game of sorts in flattering the audience, rather than arguing for what one believes to be true. It seems that the previous mentions of phronesis and practical wisdom can be applied here, as the speaker must use their judgement to make the argument as persuasive and favourable to the audience as possible. However, this type of application of practical wisdom seems completely devoid of any true consideration of virtIe, but is instead motivated purely by pragmatism.

3.2 The Importance of Moral Consistency in Chinese Thought

On the other hand, the Chinese particularly found the sincerity and honesty of the speaker to be crucial, emphasising moral consistency in both mind and in writing. An ancient proverb: "to establish credibility and cultivate virtue through careful choice of words" （修辭立其誠）, found in The Book of Changes《易經》, is often repeated in classical literature and is the embodiment of all rhetorical practices held in ancient China. This proverb highlights the importance of moral sincerity and the intricate link between language, rhetoric, and virtue. A rhetorician can only be virtuous - and thus successful - if they are honest and trustworthy, following moral conduct and presenting a candid and sincere argument.

In *Xunzi*'s chapter of Against the Twelve Masters《非十二子》, he further explains the role of virtue in speaking, stating: "No matter how much one says, if they do not follow certain conduct and act without restraint, they are a petty man （小人）even if they can speak eloquently and persuasively." The "conduct" refers to the central virtues and doctrine of Confucianism, and highlights the necessity for moral consistency, irrespective of one's skills in persuasion. This is crucial, as it again reveals the focus in Confucian rhetoric of using speech mainly as a means of cultivating and spreading virtue, with persuasion acting only as a secondary function of the subject. Confucian thought believed morality was integral not only for one's personal cultivation or character but ultimately for the benefit of society. Preserving the good and virtuous for the generations to come was paramount.

3.3 Comparison

Perhaps the key distinction between the differing views on moral sincerity lies in the role played by the audience in rhetoric. It could be said that ancient Greek rhetoric is more externally focused and concerned with how the audience will be influenced by the rhetorician. Conversely, ancient Chinese rhetoric most significantly stresses the moral responsibility of the rhetorician to himself and others, with rhetoric seen as a tool through which thinkers could impart these virtues.

Conclusion

In this paper, I have argued that while "rhetoric" is an inherently Western concept, Chinese *Xiu Ci Xue* acts as the closest counterpart to this field of persuasive language and oration - with both ancient worlds developing their own unique treatise on persuasion in relation to one's virtuous character. Both practices arose from turbulent socio-political situations, and on the surface, with a seemingly similar purpose - to persuade. However, from excerpts of both ancient

Aristotelian and Confucian texts, growing distinctions begin to emerge, where we see disparities within the virtuous attributes required in a successful rhetorician, and in the moral sincerity of the speaker.

Xui Ci Xue was, arguably, more deeply rooted in Confucian philosophy. An emphasis on one's virtuous demonstration of *ren* and the rhetorician's moral sincerity is clear. However, Aristotle's treatise on rhetoric was centred on logic and used rhetoric as a systematic, technical means of persuasion. It does not disregard a moral aspect of this skill, but this does not seem to be essential in regard to the rhetorician's success in swaying his audience, provided he can appear to be moral.

These observations contain significant implications on modern society, where mainstream media is plagued by rhetoric and the exploitation of it to attain political power and status. Through this comparative argument drawn from both pioneering ancient worlds, we, as the audience, must become conscious of the essence of rhetoric in its philosophical roots, and the overarching importance of one's moral character and sincerity.

Looking further, rather than in pure analysis of virtue or moral character, other thought-provoking arguments can be made concerning different components of rhetoric. These include the dichotomy between emotion and rationality in our judgement, or the possibilities of multicultural rhetoric as a method of communication. Additional extensions concerning modern politics can be drawn, exploring the influence of Xiu Ci Xue in modern China and its role within Mao Zedong's political theory. Comparisons can similarly be drawn from other current uses of rhetoric in the Western world, evaluating its historical development over the millennia. Ultimately, through the lenses of both rhetorical practices, key values from Aristotle and Confucius' teachings can be extrapolated to illustrate the importance of virtue, questioning the true nature in harnessing language.

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"The Stages of Economic Growth: A Non-Communist Manifesto": Rostow's Economic Model applied to the Economic Development of the People's Republic of China from 1949 to Present

Genevieve J. Moore

Introduction

"The Stages of Economic Growth: A Non-Communist Manifesto", published by American economist Walt Whitman Rostow in 1960, postulated that economic growth occurs in five stages: (i) traditional society, (ii) preconditions for take-off, (iii) take-off, (iv) drive to maturity and (v) age of high mass-consumption (Rostow 4). By analyzing China's economic growth from the establishment of the People's Republic of China in 1949 to the country's current state of economic development in 2020, this essay will discuss how China's economic growth largely satisfies the conditions outlined in Rostow's stages of economic growth, as evidenced by the fact that each stage in China's economic development after 1953 satisfies most of the criteria set out in Rostow's non-communist manifesto.

For ease of reading, all key dates in the application of Rostow's model to China's economic development will be outlined briefly. The traditional use of a dynastic governance system in China collapsed in 1912 when the Provisional Government of the Republic of China was established (Jin *et al*. 5). In 1949, the People's Republic of China was established, marking the start of an initiative for economic change in China. In 1953, a series of five-year plans under the People's Republic of China were established to transform China into an industrial power, such as the United States or England, following the examples of the Soviet Union (Shabad 189).

1. Traditional Society

China's economic conditions prior to the implementation of its first five-year plan in 1953 mimicked the conditions outlined in the "Traditional Society" stage of Rostow's model for economic growth. Rostow defined a traditional society as "one whose structure is developed within limited production functions, based on pre-Newtonian science and technology, and on pre-Newtonian attitudes towards the physical world." (4). Rostow further explained that "a society predominantly agricultural - with, in fact, usually 75%, or more of its working force in agriculture" would undergo the preconditions for take-off (18). While data on Chinese citizens engaged in agriculture pre-1953 was largely unavailable due to the confined nature of Chinese society during the dynastic governance system, in 1962 over 82% of total Chinese employment was in the agriculture sector (Felipe 127), and it seems safe to assume that prior to 1962 this percentage was either the same or higher. Accordingly, Chinese economic development prior to 1953 closely corresponds to Rostow's "Traditional Society" stage, given the limited production functions and large portion of the workforce engaged in food production.

Rostow specifies that "in terms of history then, with the phrase 'traditional society' we are grouping the whole pre-Newtonian world: the Dynasties in China" (5). While China was ruled under dynastic governance, many western countries that Rostow based his economic model on had begun to make the leap from imperialism to capitalism (Appel 168). An article in Cornell University Press explains that:

> "In the West, capitalism triggered revolutions in science, technology and economic growth with the industrial revolution. From there, it became the dominant mode of production in Europe and in most of the rest of the world. Capitalism enabled favored classes and countries to amass capital, power and knowledge at an unprecedented rate. In China, something rather different occurred" (Gates 40).

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The lack of outlook towards the physical world that limited pre-1953 China to the first stage of Rostow's model is reflected in the continual use of traditional sources for profit and the dynastic system. While China may not have lacked the tools or innovation to continue developing, it lacked the "western" outlook towards the physical world that allowed capitalism to propel economic growth elsewhere. While China's inability to advance into the second stage of Rostow's model may be contributed to its use of dynastic governance, it can be summarized that: China did not feel the intrinsic need to push past traditional outlooks on the physical world.

2. Preconditions for Take-off

China's economic development between 1953 and 1978 reflects Rostow's "Preconditions for Take-off" stage. As noted above, China's first five-year plan was introduced between 1953 and 1957. It aimed to imitate a Soviet-style of governance where a set of social, economic, educational and cultural targets were set (Huang). Between 1958 and 1961, the People's Republic of China introduced the Great Leap Forward to accelerate economic growth through state planning (Pelanda). Private ownership of land was phased out in favor of agricultural collectivism. Farmers joined collective farms, and the sharing of land, tools and draft animals became a commodity. The Great Leap Forward initiative is an example of a series of Chinese state planning initiatives that resemble the changes to society that begin to occur in Rostow's second stage of growth. The main objective of the Great Leap Forward initiative was to accelerate food production in order to raise income and funnel money into rapid industrialization (Brødsgaard and Rutten 35), which represents the increased productivity and developed interest in finance in the economy and the rise of institutions for mobilizing capital described in Rostow's model. As a part of the reform, peasant labor was utilized by the Chinese government to manufacture steel using communal backyard furnaces (Pelanda). As a result, the government stored a surplus of food to generate income from exports, creating significant changes in the Chinese economy.

Rostow noted that "two outstanding contemporary cases of economies attempting purposefully to take off are India and Communist China" (45). He also addressed that "the Chinese Communist figures are somewhat more ambitious in both agriculture and industry" (45). On the stages of economic growth, Rostow postulated that "the whole southern half of the globe plus China is caught up actively in the stage of preconditions for take-off or in the take-off itself" (92). Considering the information now available on the effects of Chinese state planning, it can be argued that China was engaged in the second stage of Rostow's model when he wrote his paper. The massive mobilization of China's population during the Great Leap Forward allowed China to develop economically at a much faster rate than it had prior to the implementation of state planning initiatives. Between 1959 and 1961, China experienced a great famine where an estimated 30 million Chinese citizens starved to death (Smil 1619). While China's strategies of state planning and fostering a competitive spirit in the Chinese people through propaganda were effective, they created negative consequences that hindered Chinese economic development. China did not fully reach the "Preconditions for Take-off" for some time due to a lack of social overhead capital. Institutions and infrastructure were not yet developed and income from the agricultural sector had not been diverted to the manufacturing and industry sectors that would increase China's GDP, as shown by a comparison of workers in agriculture, industry and services during this time. Between 1962 and 1978, the percentage of total employment in agriculture decreased from roughly 80% to 70%, while the percentage of total employment in industry and services grew less than 5% during this same period, respectively (Felipe 128). In the early-reform period, agricultural incomes grew rapidly while poverty declined (Majid 18). Chinese urban employment began to grow but did not show rapid development until 1995 (Majid 27). At the same time, China would see a massive jump in agricultural production, and the GDP rate during the reform period would reach double that of the pre-reform period (Food and Agriculture Organization).

While Chinese state planning initiatives from 1953 to 1978 may have failed to fully meet the ambitious goals set out by the Communist Party of China, such initiatives were not completely ineffective. Prior to 1953, China lacked the outlook on the physical world that would propel it forward to the second stage of Rostow's model. The Chinese government's outlook eventually began to shift, however, as it actively sought out ways to compete with dominating countries, such as the United States, and made attempts to utilize its available resources to propel its economy forward. China's new outlook on the physical world continued to push it forward into the third stage of Rostow's model.

3. Take-off

Though Rostow traced the beginning of take-off in China to the Communist victory (36), China's opening of its markets to foreign trade and implementation of free-market reforms between 1979 and 1984 served as a stimulus for the "Take-off" stage. In 1979, China opened its economy to foreign trade through the implementation of free-market reforms (Morrison 4). China's growth since then has been described by the World Bank as "the fastest sustained expansion by a major economy in history" (Morrison 1). It closely follows the key condition of Rostow's third stage that "growth its normal condition" (Rostow 7). China's free-market reforms established the reallocation of resources to sectors formerly heavily regulated by the government, such as agriculture, trade and services. For instance, reform in the agricultural sector boosted production, and workers pursued careers in the manufacturing sector (Morrison 7). New techniques and the commercialization of agriculture "are an essential condition for successful take-off; for modernization of a society increases radically its bill for agricultural products" (Rostow 8). Through to the mid-1980s, China underwent a series of liberalizing reforms aimed at building social capital (Pettis). Laws constraining productivity were repealed, resulting in rapid economic growth. For example, it became legal for Chinese citizens to produce and sell as individuals rather than collectives or organizations (Pettis). Such laws allowed the basic structure of the economy to be "transformed in such a way that a steady rate of growth can be, thereafter, regularly sustained" (9). During this period of free-market reforms, China appears to meet all the conditions set out in Rostow's third stage of economic growth.

In December of 1978, China decided to shift its focus from political movement to economic development, a decision which "laid the foundation for reform and opening-up" (Garnaut 5). To rectify the political unrest and economic fallout of the Mao-era, China set up special economic zones in Shenzhen, Zhuhai, Shantou and Xiamen. Breaking away from the inward nature of previous decades China introduced private business and market incentives to what had previously been a state-led communist system (Preen). While the private sector was virtually non-existent prior to 1978, private firms now contribute to approximately 70% of China's GDP (Preen). From Rostow's "anti-communist" perspective, it is possible to argue that China could not have developed as a state-led communist system, and that the embracing of capitalist free market reforms allowed China to develop by breaking away from its communist roots. As China's economic development follows such a unique path, it is difficult to quantify precisely how much of the country's success can be attributed to the adoption of "capitalist" features.

4. Drive to Maturity

China's economic growth between 1985 and 2009 resembles the fourth stage of Rostow's model. The "Drive to Maturity" is "the stage in which an economy demonstrates the capacity to move beyond the original industries which powered its take-off and to absorb and to apply efficiently over a very wide range of its resources - if not the whole range - the most advanced fruits of (then) modern technology" (Rostow 10). Much of China's rapid economic growth during this period can be attributed to large-scale capital investment and rapid productivity growth (Morrison 6). As evidence of this, China has been ranked as "the most rapidly evolving digital economy in the world", and this rapid growth has helped to counterbalance the economic decline of other industries such as steel and aluminum (Sharma).

During the "Drive to Maturity" stage of Rostow's model, "the structure of the working force changed in ways which increased not only the proportion of urban to total population, but also the proportion of the population working in offices or in skilled factory jobs - aware of and anxious to acquire the consumption fruits of a mature economy" (Rostow 10). This population shift can be seen in China's economic development between 1985 and 2009. Whereas China's urban population between the 1960s and 1980s was level at roughly 17%, from 1980 onwards China's urban population began to skyrocket. It reached 59% in 2019 (World Bank).

While China reaches the "Drive to Maturity" stage, the large disparity between social classes in China affects its ability to completely meet Rostow's conditions for this stage of economic development. In 2019, China's Gini coefficient value - a number between 0 and 1 that quantifies income equality - was 0.465 (CEIC Data). The United Nations classified this quantifier as a sign of severe income inequality. The top one percent of people in China owned a third of the country's total wealth as of 2017 (Leng). Due to these disparities in wealth and China's large rural economy, China does not meet Rostow's condition that "the extension of industrialization ceases to be acceptable as an overriding goal", as the disparate social class distinctions in China mean that industrialization in small towns and rural areas is still very acceptable and desired as an overriding social goal.

5. Age of High Mass Consumption

China's continued growth from 2010 to present resembles Rostow's final stage of economic development, the "Age of High Mass-Consumption". China's economic initiatives in the past decade show a pattern of seeking hegemony through initiatives such as the "Belt and Road" initiative, which aims to connect Asia, Europe and Africa in an attempt by China to gain global power. China seeks power on the world scene, to an extent that Rostow may have considered as dangerous, due to the anti-communist nature of his manifesto (Lawler). As China's economy has matured, its real GDP growth has slowed significantly, from 14.2% per annum in 2007 to 6.6% per annum in 2018, and that growth is projected by the International Monetary Fund (IMF) to fall to 5.5% per annum by 2024 (Morrison). While China's past economic initiatives show a desire for continued growth at a rapid rate, the Chinese government has embraced slower economic growth, acknowledging the need for China to embrace a new growth model that relies less on fixed investment and exports, and more on private consumption, services and innovation to drive economic growth (Morrison). The Chinese government's actions reflect a larger trend in High Mass-Consumption" societies, where economic initiatives morph into socioeconomic conditions. The country now has the capacity to look at economic initiatives from a perspective other than a purely monetary one.

As with the "Drive to Maturity" stage, China's profound class inequalities between rural and urban areas means that there is a substantial difference between the economic stage of development in urban and rural parts of China. In 2007, the per capita GDP in China's inland regions averaged half or less than half of that in China's coastal regions (Fan *et al*. 48). This significant issue in the last two stages of China's economic development when compared to Rostow's model shows a larger issue with Rostow's model, in that it does not consider the different regions of a country, but rather its economic status as a whole. This assumption makes Rostow's economic model difficult to apply across countries and undermines the credibility of his model.

Conclusion

By analyzing China's economic development through the specifications of Rostow's "The Stages of Economic Growth: A Non-Communist Manifesto", it is apparent that China's development coincides with many of Rostow's specifications. The main point of contention that limits the application of Rostow's model to China lies in the fact that Rostow's model does not consider regional disparities, which are prevalent in many modern societies, even those that Rostow traditionally studied to create his stages of economic growth. As a major local issue in China, regional disparities between inland and coastal areas of China, notably the special economic zones, limit the ability to categorize China into one stage of the model, as different regions appear to be in different stages of economic growth. An inherent bias to be considered in Rostow's model lies in the title "A Non-Communist Manifesto". While it can be argued that the Chinese governance system is a communist governance with liberal and free-market qualities, as noted in the 1979 economic reforms, China is still a communist country. Rostow's stages of growth outline a capitalist economic growth, whereas economic growth under a communist regime will not necessarily follow that of its capitalist predecessors.

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Earth Dragons: How Do Cocodilians Reflect Human -Wildlife Attitudes in Ancient China?

Ines Belza-Garcia

Introduction

Several theories have been developed about the constitution of the mythical Chinese dragon and its origins. One popular theory in the twentieth century was that the dragons were mythologized alligators (Cortney, 94). This theory is backed by linguistic evidence: In Figure 1 the earliest pictographic Chinese logograph for the dragon 龍 is shown to resemble a crocodilian form (Thorbjarnarson *et al*. 62). Today, Chinese alligators in the Yangtze river are referred to as *tulong* 土龍, literally meaning "earth dragon" (Thorbjarnarson *et al*. 63). The phenotypic resemblance between the alligator and the dragon is also very clear. Despite variations in its appearance depicted throughout history, the mythical dragon maintains a highly reptilian form. Veritably, one of the earliest representations of dragons are pig dragons as shown in Figure 2, which are thought to look very similar to an alligator hatchling (Thorbjarnarson *et al*. 64). Furthermore, the zoological classification of dragons and alligators in Chinese history is quite similar. Indeed, *Bencao gangmu* 本草綱目 [Systematic Compendium of Materia Medica], a highly regarded book of Chinese medicine and natural history, categorizes both the alligator and the dragon as "鱗" [scaled animals]. In the description of the alligator within the same book, *Li Shizhen* 李時珍 compares the alligator to a dragon and says they bear a high resemblance. Beyond physical resemblance, there are also behavioral connections between the alligator and dragon including drowsiness and hibernation pattern characteristics (Li vol. 6 59). Finally, there is also another important behavioral similarity, which is their strong connection to water. Both creatures were believed to bring rainfall and were, thus, related to flooding.

Given the centrality of the dragon in Chinese culture, as well as its strong identification with the crocodilian, this paper will examine Chinese people's attitudes to crocodilians – how they mythologized, administered, and utilized them. By so doing, I wish to uncover the complex relation between human and nature in ancient China.

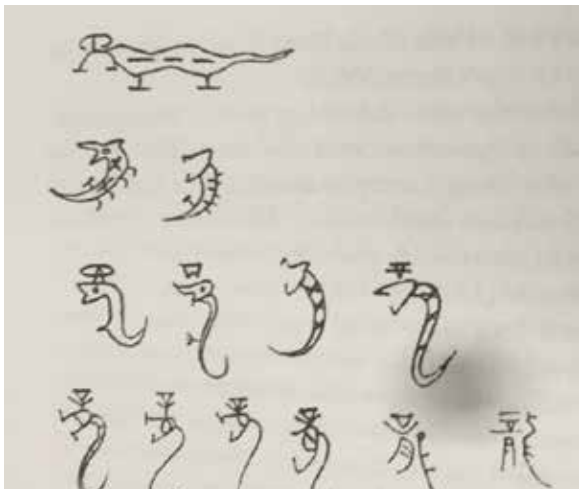

Figure 1. (Thorbjarnarson *et al*.)

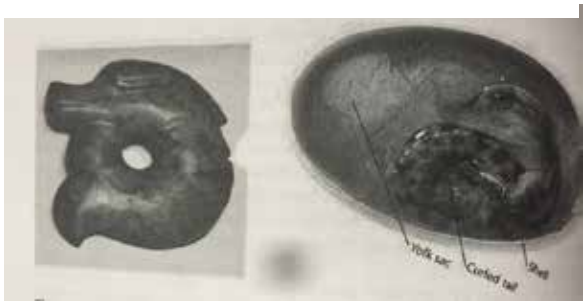

Figure 2. (Thorbjarnarson *et al.)*

1. Mythologizing the Crocodilians

Interlaced with the concept of worship of a deity, there is a concept of respect and fear which could potentially be identified in the crocodilian as well as the dragon. This relationship with higher-level deities can be further explained and represented through the crocodilian. Being a large predator, the crocodilian is

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considered a threat to people. This fear of crocodilians has appeared in the form of dragons in many cultures including Western, Mesoamerican, Babylonian and Chinese cultures. The appearance of dragon mythical figures in different cultures across the world can be attributed to an instinctive fear of crocodilians (Thorbjarnarson *et al*. 51-53). Crocodilians were animals that preyed on humans, especially the Nile crocodile and the Estuarine crocodile. This instilled a fear in humans through evolution to avoid encountering these animals.

Dragon ceremonies were also an essential part of the human relationship with a deified animal. The invocation of dragons for rainfall can be traced back to pre-Buddhist China, through sympathetic magic of an imitative type (a magic type that bring out material results by a display of phenomena similar to those desired). In *Chunqiu fanlu* 春秋繁露 [Luxuriant Dew of the Spring and Autumn Annals], a Han Dynasty text, chapter 秋雨[Autumn Rainfall], prayers and sacrifices are used during the five occasions of the year: spring, summer, end of summer, autumn and winter during the Han Dynasty. Ritual specialists often looked to scaly reptiles when performing sympathetic magic to invoke a dragon to control rainfall (Thorbjarnarson *et al*. 97). One such ceremony to invoke rainfall was characterized by throwing tiger bones, the bones of the only creature that dragons were said to fear, into bodies of water. The bones scared the dragons into flight, thereby causing rainfall. Another ritual took place on the second day of the second lunar month – a date known as the 龍抬頭[*Raising of the Dragon's Head*] (Courtney 97). An important water rite was performed by women who traced lines with chalk to water vessels in their homes. As rain dragons represented the fecundity of nature, women who were trying to conceive children sometimes used candles from dragon processions as part of fertility rituals. The ceremonies that people performed represented a cultural response to the disaster – they helped people explain hazards and allowed communities to use religion to deal with the environment, thus providing a sense of agency in otherwise vulnerable situations. (Courtney 92)

When a crocodilian vocalizes, it creates a cloud of vapor due to the humidity and cold of the water they reside in (Thorbjarnarson *et al.* 66-67). The Chinese mistook this for clouds and believed this would cause rain. *The Classic of Change* 易經, a book from the Zhou Dynasty, suggests a link between alligator vocalizations and life-giving springtime rains, and states that the dragon is thunder (Thorbjarnarson *et al*. 64-65). Similarly, *Extensive Records of the Taiping Era* 太平廣記 from the Song Dynasty also refers to alligators as "one which calls thunder". This can be explained by the increased amount of vocalizations produced by alligators when there are low-frequency sounds such as thunder (Thorbjarnarson *et al*. 65). Alternatively, the vocalizations made by crocodilians are not unlike thunder and could potentially be mistaken for thunder. The *Bencao gangmu* 本草綱目 [Compendium of Malaria medica] says that alligators exhale and create clouds that cause rain. Crocodilians are highly vocal, they call with both their heads and tails out of the water in early morning behavior. These observed behaviors have been transferred to the mythical dragons. The seasonal migration pattern of crocodilians meant that they arrived at and left human settlements along with the tide and rainfall, bringing them to the middle Yangzi in the late spring, just as the rains were engorging the wetlands with water. They then disappeared again in the autumn, just as rivers were beginning to recede. It is not implausible that early human communities have drawn unconscious associations between the arrival of these alligators and the coming of the rains: this explains why dragons had been strongly linked to water (Thorbjarnarson *et al*. 51,) and were believed to live underwater or underground. They were associated with rivers and wetlands and were thought to control thunder, clouds, rain, and flooding (Thorbjarnarson *et al*. 56). Earlier Chinese classics also say that when rain is to be expected, dragons scream and their breath becomes clouds.

All this reflects the observative nature of the Chinese towards their surroundings. They used animals and deities as mediums for human to nature communication and as ways of predicting what was to them unpredictable or uncontrollable. Since Agriculture was a very important part of Ancient China's society, these beliefs were important to rely on when the environment was unmitigable.

2. Using and Knowing the Crocodilian

However, the relation between Chinese people and the crocodilian-dragon cannot be simply summarized by fear and worship. Ancient Chinese also hunted and preyed on crocodilians, using them for medicine.

The *crocodilian* 鼉 and the *dragons* 龍 have been a part of traditional Chinese medicine for a long time. Both are ingredients that cure heat 火 and particularly target menstruation and fertility issues in women. To obtain these ingredients for the cure, there are many traditional methods to hunt and capture the animal.

The *Bencao gangmu* 本草綱目 states that the crocodilians are killed by pouring boiling water into their mouths and letting them die slowly, then skinning the animals (Li Shizhen vol. 6 59). Marco Polo, who visited China in the 13th century, described in his travelogue the traditional method of catching alligators and said that the locals would line the paths of the alligator so it would be impaled by the spear (Thorbjarnarson *et al*. 35). In the 1920s, the American zoologist Clifford H. Pope also caught his Chinese Alligator specimens using the local method of hunt which was to dig them out of their burrows (Pope 65-68). Unlike in the previous section, in which I mentioned the fear humans had of crocodilians due to their being preyed upon by crocodilians, here the relationship is reversed as the human becomes the predator of the crocodilian. We may perceive a competition for the position of the predator between crocodiles and humans in ancient China shifting overtime.

Figure 3. (Li, vol. 6.)

While there are many records on the brutal methods to catch and kill crocodilians, or "earth dragons*", Bencao gangmu* also states that the dragon had to be found dead and only their bones were used for medicine. This can create an interesting identification in the social hierarchy between dragons and alligators. The dragon, which was considered a 上等 [top class] animal should not be killed while the alligator, a 中等 [medium class] animal could, and brutally so. The need to classify and categorize the natural word in order to understand it shows a curious and inquiring attitude towards nature and the world around them; the classification of natural being from the most vile to the most noble also reflects the importance of social hierarchy in China, and how the Chinese projected their understanding of their own society into their understanding of nature. Despite the belief that *dragons* and *crocodilians* are both 龍, they were placed under a social hierarchy just like the one existing between emperors and commoners within mankind. Furthermore, the fact that humans are still included in this book of wildlife, albeit categorized as the most noble creature, tells a lot about the way that humans interact with nature as a part of it.

3. Personifying and Administering of the Natural World

Human-crocodilian relation are not always so belligerent with one side necessarily preying on the other. Numerous ancient documents also record a peaceful relation between them, with crocodilians almost considered as royal subjects, and administered by officials.

The personification of animals has been a common phenomenon for applying nature in many cultures around the world, including Chinese culture. There are accounts of criminals being thrown into lakes full of crocodiles; if they were eaten, the crimin were prove guilty, but if they survived for three days they were innocent, allowing the crocodile to take on the human role of a judge (Thorbjarnarson *et al*. 33). In the 左傳 [Commentary of Zuo], the politician Zichan 子產 disapproved of their people offering sacrifices when two dragons appeared fighting in a place named Weiyuan. He said, "When we fight, dragons do not watch, when dragons fight, why should we watch? Weiyuan was the place where dragons lived, worshiping and praying to them, how could we ask them to leave? We don't require of dragons, and dragons don't require of us." Zichan supports his reasoning and processes logically, and reveals the mutual equality and respect between both creatures. Later in Tang Dynasty, in the text 祭鱷魚文[A Plea to the Crocodile] by Han Yu 韓愈, the author speaks directly to the crocodilians in a lake in Guangdong. The crocodilians were predating on the cattle of the people, so he threatened to wage war if they did not leave, giving them seven days to complete the accord. From the type of personification used, it can be seen that there is an egalitarian relationship between human and animal. In Han Yu's text and in the *Commentary of Zuo*, the dragon and crocodilian are portrayed and treated as intelligent creatures, and logical arguments with terms and conditions used to negotiate with them. This use of personification can also be seen as a way the Chinese unpacked the phenomena and the animals around them: by relating themselves to it.

The role of the State in creating these relations is worthy of attention, particularly in the case of the dragon deity. At the beginning, the crocodilian-dragon deity was a wild creature, feared and worshiped for their capacity to control rainfall by the common people. Rather than suppressing dragon worship, officials employed various means to redirect the spiritual authority of these creatures towards the State. Scholars have spoken of this official domestication as the "superscription of symbols", a process through which culturally significant and symbolic animals are adopted and molded into an official bureaucratic symbol of the state (Courtney 97). From the Song Dynasty onwards, dragons adorned the clothes, flags and throne of the imperial family. Hydraulic agriculture changed the nature of dragons, and their role changed from symbols of soil fertility to avatars of environmental uncertainty. Legendary hydraulic masters such as Dayu 大禹 and Li Bing 李冰 became new forms of deity, worshipped for their capacities to domesticate dragons and tame rivers. The state also inserted itself into the local dragon rituals conducted in the fifth lunar month. This was converted from a rain-regulating ceremony into an occasion to commemorate the death of the scholar-official Qu Yuan (Dragon Boat Festival). The crocodilian-dragons worshipped on this occasion were woven into the narrative of the State. Through the process of superscription, the court was able to convert a local deity of great importance due to its role in rainfall in an agricultural society, into a symbol of the state. They utilized the dragon for their benefit to gain authority in a key part of agricultural China.

Conclusion

In an attempt to explain nature, the Chinese have recurrently used characteristically human thought processes and human classification and understandings of their own society, reflecting ancient Chinese society and culture through the lens of nature. It also expresses the human understanding of themselves as a part of nature in which they took part in a fair egalitarian manner. There was also a predator-prey relationship between humans and nature, which in the case of the crocodilians and dragons, appears to have experienced shifts over time. Closely linked to the predator-prey relationship is the practice of worship which comes interlaced with fear, and gives rise to a ritualistic relationship between animals and humans. Dragons and crocodilians were used by Chinese rulers for direct utilitarian benefit, namely to gain authority over the common people, but they were also used more broadly by locals as a medium for human-to-nature communication, which in turn provided a sense of agency in the midst of uncontrollable nature.

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從建立到抗戰前，商務印書館成功原因之探討

文延中

引言

本文旨在探討商務印書館建立後至抗日戰爭前（1897-1936），是如何利用各種策略與靈活的應變能力，從一個平平無奇的印書館，搖身一變成為中國出版業的代表。本文主要從商務的選書策略、管理層的運作、銷售模式與宣傳和應對政治危機四方面來分析，探討商務印書館成功的秘訣，以及其如何在商業界成為其他企業仿效的對象。

一、商務印書館的建立

大清光緒廿三年正月初十（1897 年 2 月 11 日），也就是中日甲午戰爭後的第二年，商人夏瑞芳、鮑咸恩、鮑咸昌、高鳳池四人，集資 3750 元和購買了數架印字機，於上海江西路北京路首德昌里末街 3 號創立了「商務印書館」。商務印書館初期因以承印商業簿記表冊、賬本、教會圖書等為主，故得名「商務」[1]。商務是中國印刷與印書業的創始者和佼佼者，其「倡明教育，開啟民智」之印書宗旨，為中國現代文化與教育帶來深遠的影響。

二、選書策略

商務印書館其中一個最大成功因素就是其精明的選書眼光，以及看準市場需要而大量印刷、積極營銷的策略。商務初開辦時是家印刷企業，並沒有太大的作為。在創立第二年 1898 年，讓商務聲譽大振的第一本書就是《華英初階》。當時正值光緒皇帝（1871-1908 年在位）推行洋務運動，夏瑞芳等人捕捉到這個商機，專門邀請謝洪麥（當時的蘇州大學助教）進行翻譯工作。上海學英文的人不少，通常有七八種課本供人閱讀，其中有上海教會學校編的，有國外出版的，編者都是英美人。其中採用最廣的是供印度人使用的印度課本 — 《文典小課》(New language lesson, by William Swinston)。該書是英國人為印度人學英語編的，由於它全用英文，中國的初學讀者極感不便。因此商務決定對此書進行修改，在書中每個生詞標上中文意思。當時這書被譽為是創舉，大受讀者歡迎。第一次印刷了 2000 份，接著夏瑞芳向各學校四處推銷，不消二十天便售光了。夏瑞芳趁著此機會，出版後續各冊，再加以進修，推出了《華英進階》。商務最初的發行方法，雖然書極薄，售價低（每本以二元二角出售），經濟利潤不一定有多少，但此書在市場上流傳了十多年，為商務的聲譽幫助不小[2]。正是商務當時眼光獨到，才讓商務撈到了第一桶金。

接著商務在 1904 年推出一套《最新教科書》。這套國語教科書最大的特點是插圖和排版形式。初小第一冊語言共 60 課，有 100 副插圖，其中 4 副是彩圖。此外，每一課課文和插圖都安排在一個展面上，這和過去教科書密密麻麻的排版大相逕庭。結果大受教師、家長歡迎，出版幾天便售光。當時的編輯蔣維喬說，「第一冊出版，未及幾個月，行銷至十萬餘冊」[3]。可見讀者完全被其內容、形式吸引。從此，商務在教科書市場上站穩腳步，逐步覆蓋了各科和各年齡段。舊式教

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[1]「發展歷史」，商務印書館 www.commercialpress.com.hk/ww/milestones.html。

[2] 趙俊邁，《典瑞流芳:民國大出版家夏瑞芳》（台灣商務，2014）。

[3] 李家驅，《商務印書館與近代知識文化的傳播》（香港中文大學，2017）, 頁 53。

科書的成本是定價的 20%[4]，當時商務課本沒有直接競爭對手，因此其利潤實際上是十分可觀的。

圖一：蒙學中國地理教科書 (1903 年)

圖二：《最新國文教科書》第一冊，第二十五節(1904 年)

再者，原本已過時的照像石印經商務印書館經手後，又再次普及起來。在十九世紀七十年代中開始以照像石印影印古籍，因為照像石印能將雕版印刷書縮得極小而字跡仍十分清楚，而售價比雕版印刷書又便宜很多。生意很好，利潤很可觀，人們於是紛紛效仿。可是人們因為追求節約成本，字越印越小，卻極不注意質量，走上了絕路 [5]。在 1906 年廢科舉後，石印業因以印科舉用書為大宗，幾乎全軍覆滅。但在 1908 年，商務通過用照相石印明代古代史籍，開創了將石印影印推進到與雕版印刷母本相結合的時期，出版物具有極高的質量。後來也陸續影印《涵芬樓秘笈》、《四部叢書》、《百衲本二十四史》等，這些都是實用而且好的母本相結合的。重新印刷這些古本不但使數量稀少的善本和瀕於淹沒的古本化身千百得以延續，優質的紙質還讓其更耐用和更加實用。另外，影印古籍不僅使石印書進入了古籍書店 [6]，還普遍受到當時藏書家的賞識，也為商務贏得不少聲譽和增加不少收入。

三、管理層策略與人才選擇標準

商務印書館初開辦時是個印刷企業，第二年(1898 年)才開始出版書籍。這時，商務書籍的發行不能直接靠推銷的辦法，因為它沒有店面，印了很多書仍無法變成現金。據高鳳池在《本館創業史》中談，開創時規模小，上至經理，下至出店 (送貨工人) 都是夏瑞芳一人。很快，商務物色到「書業奇才」沈知方，還有呂子泉，愈志賢等人。他們都是當時書業中極有才幹的人，商務請他們負責發行。沈知方後來辦世界書局，呂子泉辦大東書局。不久，商務自己有了店面，叫「滄海山房」，時間大概在 1900 年。有了滄海山房這樣一個發行據點，就可以直接買賣書籍，自己出版物的利潤最後都歸自己，在經濟上是十分划算的。

1902 年商務有幸邀請到張元濟加入商務印書館後正式創設三所，即編輯所、印刷所、發行所，一直維持到民國初期。在他的任期內，張元濟多次提出改革方案，使得商務變得注重西方文化學術思想的編譯，如翻譯赫胥黎的著作《天演論》[7]，震動了當時封閉的中國社會。同時，他也注重帶動新文化、傳播新知識。如商務注重發行雜誌，其旗下或編輯或發行的雜誌種類，前後多達 80 餘種，涵蓋到教育、文化、歷史、文學、科學、經濟、時政、婦女、兒童等多個領域。[8]《東方雜誌》、《教育雜誌》、《小說月報》、《婦女雜誌》、《兒童世界》都堪稱同期全國同類刊物的翹楚，刊印時間既長 (《東方

[4] 李家驅，《商務印書館與近代知識文化的傳播》（香港中文大學,2017）, 頁 54。

[5] 錢存訓，《造紙及印刷》（台灣商務，1999 年），頁 78-79。

[6] 李家驅，《商務印書館與近代知識文化的傳播》（香港中文大學,2017），頁 150-152。

[7] 王有朋，《嚴復與天演論》，文彙報，news.eastday.com/epublish/big5/paper81/4/class008100006/hwz542679.htm。

[8] 陳馳，「倡明教育，開啟民智」商務跨越 115 周年《文匯報》2012 年 8 月 3 日 paper.wenweipo.com/2012/08/03/zt1208030018.htm。

雜誌》是民國時代壽命最長的雜誌），歷史影響亦大[9]。

由於編輯所、印刷所、發行所由不同人士主持，所以經常出現意見不一的情況。1912 至 1915 年間發生了兩件事件，促使商務重新審視和調整了管理制度。第一是夏瑞芳挪用商務資本炒股失敗[10]。同年，日本股東對於董事及經理權限不清，特別是財務出入問題，提出猛烈的批評。第二，夏氏原是三方衝突的和解員。但 1914 年夏瑞芳被刺身亡，其他兩個部門（張元濟和高鳳池）的矛盾此時愈發激烈。因此董事會決定在 1915 設立總務處，作為商務的決策中心，重要事項概由三所所長一同敲定[11]。這有效舒緩了各個部門的矛盾，讓商務再次回到正確的路軌上。[12]

1929 年總經理鮑咸昌病逝。因此王雲五在張元濟和高鳳池推介下，成為總經理。他在 1930 年 3 月至 9 月出洋（如美國、英國）考察海外出版機構情況。此次考察開闊了他的眼界，對他日後的改革商務深有啟發。他回來後對財務、物料、人事和組織提出科學的管理辦法。當中對人事與評估工作準則的改革，至為革命性。他構想以量化的方法，先行釐定出館內各項工作所需的時間、完成標準和單位成本，然後要求員工每天登記工作記錄，再以預訂的標準評定各部員工的工作表現，按勞分配。

商務在改革前重用「舊人」，也「按資格起薪」。這是創業骨幹的方針，也是舊時社會上的一般做法，其代表人是高鳳池。在這個方針下，資方非不得以不會主動辭退服務多年的職工。這個方針鼓勵職工循規蹈矩安於職守，不作非分想，對企業有一定的凝聚力。這也有其缺點，就是老職工薪水相對比年輕職工高，而工作並非都要經驗豐富的老職工才能做好，所以其實並不划算。另外，有時候職工的工作效率與他們的所得的薪金卻不相符，令反對此制度的聲音漸漸升起。

1916 年，張元濟向高鳳池提出他的新用人方針，建議採用年輕人[13]。新人的錄用標準簡單易明，即有高學位。1922 年到 1924 年的《商務印書館通訊錄》可證明他們用人上的改革，當時編譯所長王雲五改組編譯所，「許多資格最老的編輯被淘汰」，而改由剛歸國的留學生擔任各部長。9 個專業部的部長，據 1925 年 10 月統計，7 位是新人。2 位舊人則在數年後被辭退。商務有幾位負有盛名的年輕人，他們中最高學歷是大學預科，思想進步，能力很強。他們都主編刊物。例如沈雁冰，是《小說月報》的主編。他使刊物成為新文學刊物，銷量從原本的每期 2000 份，很快就上升到 10,000 份。[14]

四、銷售模式與宣傳

商務印書館利用自己銷貨點多的特點，採取集中備貨，分支館勤添的辦法。這就把脫銷和積壓兩個方面的問題都解決了。也是說全部發行責任和風險只有一個機構負擔。這個機構用掌握各銷貨點報表的辦法了解每種書的銷貨狀況，用勤印的辦法化解風險。

1916-1922 存貨比率[15]

年份	年底存活數	本年度銷貨	銷貨與存貨比
1916	5919244	2175444	1:2.72
1917	5658919	2610954	1:2.17
1918	5138315	2475242	1:2.08
1919	4076666	3467159	1:1.18
1920	5329879	4009054	1:1.30
1921	7033323	5031705	1:1.40
1922	7189217	5375942	1:1.34
合計	40345563	25145500	1:1.60

[9] 黃良吉，《東方雜誌之刊行及其影響之研究》（台北：商務印書館，1969 年出版）頁 154。

[10] 李家驅，《商務印書館與近代知識文化的傳播》（香港中文大學,2017）頁 29。

[11] 榮遠，《張元濟教科書編輯與出版經營思想研究》www.zyjlib.com/zygk/shownews.asp?id=1002。

[12] 郭太風，《王雲五評傳》（昌明文化出版社）頁 45-47。

[13] 汪家熔，《商務印書館的經營管理》，頁 67。

[14] 戴景素，《商務印書館前期的推廣和宣傳》，頁 101。

[15] 莊愈，《三十五年來之商務印書館》，〈商務印書館歷年營業比較表〉，頁 751-752。

以上圖表展現了以往商務備貨量高的特點。（相比之下，二十世紀下半葉以後，存貨量明顯下降，1965 年為 1:0.75，1977 年為 1:09）。這不但能保障銷售量，加一層保障，也可以減低生產線停工或延遲而失去顧客的風險，也透過大量生產而降低產品成本。[16]

另一方面，商務印刷館一開始就注意廣告。當它還是以印刷為主的時候，就沒有忘記利用一切機會做不必花錢而又有實效的廣告，如它在承印的書刊書口下腳印上「商務印書館代印」七個 字。既省錢，又有效。[17]此外，商務印書館並不吝嗇以高水平的人做宣傳工作。如蔣介石執掌南京政府後跟隨他 20 年的文告撰稿者的陳布雷，1920 年進商務不久就被安排在宣傳科。宣傳科長張世鎏是高級編輯，當時最大的漢譯《韋氏大詞典》(Webster's Dictionary)工作就是他主持翻譯的。這些足以證實商務對宣傳的重視[18]。

用心做好每一處細節，是商務宣傳的一個重點，如每種書都有內容介紹。這在今天已是慣例，但當時只有商務這樣做。原因是它必須使每個職工都知道本館有些什麼書，其內容，和其他類似書有什麼區別。現在都由各書的責任編輯撰寫內容提要。以前書本的提要往往公式化，寫出來的並不能顯現它的個性。這是現代書籍最大的問題：出於眾手而千篇一律。因此商務要求書本統一由宣傳撰寫。如果天天交出來的稿子都雷同，上層是不答應的。要求透徹了解書本，用心思寫，寫出各書的特點。這就顯得千姿百態。朱自清在評價老舍的《趙子曰》時，他在介紹中充分肯定了這些廣告文字深刻地揭示了書本的特點。一篇廣告能得到朱自清這樣的散文家的讚賞，是極不容易的[19]。

五、應對政治危機

在應對政治危機方面，商務憑著他們的眼光和預測能力，以及他們員工之間的實幹、團結讓他們在各種戰爭及爭執中繼續屹立、成長。

早在 1903 年 10 月至 1921 年底，商務與日本金港堂的原亮三郎合資，以增加營運資金。這一段時間出書量逐漸增加，並吸收了日本的印刷技術，也採用了先進印刷設備和品質更好更耐用的日本紙，業務蒸蒸日上。合資的期間商務所得利潤是 95 萬元，金港堂的利潤是 52 萬左右。[20]可是，1919 年正值五四事件期間，國內產生一股抵制日貨提倡國貨的潮流。中華書局看準此機會，自我宣傳，並向商務肆意攻擊，報導商務含有日人股份。商務意識到自身的弱點，早已有緊急應對措施。於是張元濟吩咐各部門，劃清商務與日本之間的任何關係，如：停載各種雜誌內的日本廣告，立即停止採用日本紙。商務明顯加強推廣「國貨」觀念：在教科書提及「中國無邊紙印」，以達到宣傳效果。另外在廣告附上「請看商務印書館收回日股之證據」一句後，附上商務收回日股的合同，再加昔日各地報章剪存證據。標題用字、信息結構十分簡潔。另外，在多項儀器文具的廣告標語中，強調賣點是：產品由商務「自製」。[21]是次事件充分反映出商務懂得善用媒體的效應，以及商務機智拆解危機的能力。

1932 年「一．二八」事變前，商務的資本額是共 2005 萬元。戰爭爆發後，日本軍針對當時中國經濟樞紐—上海進行攻擊。因此商務損失慘重，共 1633 萬元。所有剩餘物資扣除負債尚存 285 萬元，後來陸續從灰燼中整理出廢舊物資價值 87 萬元。同年 8 月，商務的勞資雙方以這 372 萬元財產，連同版權和信譽，努力地進行恢復。雙方都不是單為謀利和謀生，而是發自一種不屈的民族意識。董事長張元濟說道：「印書館誠如來書，未必不可恢復。平地尚可為山，況所負者猶不止於一簣。設竟從此澌滅，未免太為日本人所輕」[22]。正是此不屈於外敵入侵的民族精神，勞方不僅當時同意放棄 82%的退休金和退職

[16] 戴景素，《商務印書館前期的推廣和宣傳》，頁 101。

[17] 榮遠，《張元濟教科書編輯與出版經營思想研究》www.zyjlib.com/zygk/shownews.asp?id=1002。

[18] 陳布雷，《陳布雷回憶錄》台灣數位出版聯盟，頁 71。

[19] 肖東發：《中國編輯出版史》，遼寧教育出版社，頁 171。

[20] 鈎沉：〈商務印書館早期與日本金港堂的合資〉，商務印書館，www.cp.com.cn/Content/2014/08-1/1811499941.html。

[21] 李家驅：〈商務印書館與近代知識文化的傳播〉，香港中文大學，2017，頁 198。

[22] 王濤：〈在出版事業中完善人生——張元濟先生與商務印書〉，《國學網》，www.guoxue.com/?p=43059。

金接受全體解僱，復業後承受沒有退休金、退職金、減少福利待遇和每年花紅，以及加倍的工作。[23] 工人工作時間沒變，但勞動強度加強。當時印刷的機器少了四成，工人亦不及前之一半：而生產能力卻提升了二倍。至 1936 年底，短短 4 年 4 個月，沒有 1 分錢新的資本注入，每年還支付大量股息、紅利，資本額由原有 372 萬恢復至 500 萬元。而當時的實際資產亦接近 1932 年被毀前，恢復至 1800 萬至 2400 萬之間。[24]

結論

商務秉承著「倡明教育，開啟民智」之宗旨，而他們也確實做到了。他們在印書界的地位是不容置疑的，對中國文化和知識傳播的貢獻也居功厥偉。商務憑著他們銳利的選書和用人眼光、條理分明的管理策略和機敏的應對策略，在患難與各種危機中茁壯成長，這些是他們成功的重大因素。他們成為中國出版業代表的過程十分勵志，也為同行及其他企業設下一個很好的學習榜樣。

[23] 郭曄旻：〈商務印書館 120 年｜被日軍炸毀的「黃金時代」〉，《澎湃新聞》，2017 年 2 月 16 日），www.thepaper.cn/newsDetail_forward_1618596 。

[24] 金滿樓：〈一二八事變中，日軍為何率先炸毀商務印書館和東方圖書館？〉，《每日頭條》，2017 年 11 月 21 日，kknews.cc/zh-hk/history/8xo52xq.html。

How Did the Chinese Literati React to Christian Cosmology Introduced by the Jesuits During the Late Ming Dynasty?

Yuet Yee Kleio Kwok

Introduction

Since the dawn of the sixteenth century, there has been a considerable amount of trade and exchange between China and Europe. The West did not know much about China, but believed that it was big and prosperous. The Catholic Church, and the Jesuits Order which Italian priest Matteo Ricci belonged to, were determined to convert the world during the period of the Counter-Reformation, and they saw China as a promising field for evangelisation (Bragg).

It was against this social background that the first Jesuits missionaries, Michele Ruggieri and Matteo Ricci, arrived in China in 1583 (Gernet 15). The Jesuits Order was relatively new, and had only just been founded in 1534. They were a group of fiercely intellectual missionaries, who had an extensive period of training grounded in Western classics, history, philosophy, mathematics, the sciences, and theology. What distinguished them from the other Catholic orders was their flexibility and mobility — Jesuit priests swore an additional vow of obedience to the Pope to go wherever the Church sent them. Their main objective was to convert the emperor, and they set about this task by befriending and converting cultivated circles in the hopes that they would become influential enough to reach the Imperial Court.

At first Ruggieri and Ricci assumed the appearance of Buddhist monks, but soon realised that the monks did not have the prestige and authority they had in Europe. Ricci devoted the following years to studying the Four Books of Confucianism and other classical texts. Twelve years later, he returned, this time dressed in the garb of the literati in an attempt to assimilate and be well received by Chinese high society.

This time round he was far more successful. His catechism, *The True Meaning of The Lord of Heaven* [天主實義], aligned foreign concepts with traditional Chinese ideas in order to persuade Chinese readers, and was widely read and discussed. The missionaries cleverly interweaved science with Christian concepts to prove that their religion was founded upon reason and logic, and thus true and superior. The introduction of these new ideas about the natural world soon came into conflict with traditional Chinese ideas on the same subjects.

This essay will be divided into three subsections. The first section will explore the then existing Western and Chinese ideas of Creation, and the main conflicts that arose between the Western idea which posits the existence of a supreme Creator and the Chinese idea which takes the universe to have naturally came into being. The second section will explore the Western and Chinese concepts of the structure of the universe, and how the Chinese responded to the imperfect transmission of the European model of the universe. The third section will explore the clash between the Chinese square and flat earth notion with the Western special round earth model, and the Chinese response to this new idea. The final section will assess the overall outcome of the Jesuit's China mission, and discuss the lessons learned from the transmission of ideas and interaction between two vastly different civilisations.

1. Creation

The first (and arguably) most important difference between the Chinese and the Jesuits is their perception of creation.

Chinese thought at that time was heavily influenced by the prominent Song Dynasty scholar and philosopher Zhu Xi (AD 1130 - 1200). He is credited with synthesising and compiling the Neo-Confucian thought of his predecessors, and founding the dominant school of thought during the Song and Ming Dynasties. He was a devoted follower of the classics and wrote commentaries on almost all the Confucian classics, most notably the *Four Books* 四書 (De Bary 669).

This article was written as a culminating essay for the *Shuyuan* NRI Scholar's Retreat at Cambridge University, 2019.

He believed that the world was governed by two inherent, omnipresent, uncreated, primordial and complementary energies: *li* 理, or "principle", and *qi* 氣, sometimes translated as "physical" or "material force". Both energies manifest in different ways. However, one cannot exist without the other because everything must first be endowed with *li* before it has a corporeal form in *qi*, while *qi* gives *li* a place to settle; thus they cannot be discussed as prior or posterior (De Bary 669).

Zhu Xi also believed in a higher principle called the *Taiji* 太極, or the Supreme Ultimate. It was the *li* of the myriad things, and everything contained the *Taiji* in its entirety. According to the text *Taiji Tushuo* 太極圖說:

> It existed before the creation of Heaven and Earth, and through movement, generated *Yang*; through tranquility, it generated *Yin*. In the beginning, *qi*, consisting of *Yin* and *Yang*, pressed together and revolved, eventually consolidating to form the earth in the centre of the universe. The clear part of material force formed the sky, the sun and moon, and the stars and zodiacal spaces, while the turbid, coarser parts formed the earth.
>
> (De Bary 672)

The Jesuits on the other hand, had a vastly different perception of a divine creator. They thought of God as an omniscient and omnipotent figure who personally intervened in the mortal world. The first chapter of the *Genesis* states that the earth was originally without form, and void. God first created heaven and earth, and then set about embellishing the world in six days. The missionaries also viewed Him in a benevolent light, and Ricci writes the following in his catechism:

> He is perfectly good and without a blemish and is the final resting place of all goodness. He cannot harbour any evil whatsoever. His graciousness is broad and without limit, open to all and impartial and reaches everywhere. Even the smallest insect is a recipient of His benefits (Ricci 95).

Ricci strove to find key commonalities between *Taiji* and God in the hopes that the Chinese would be more accepting of Christianity. In some ways, God is very similar to *Taiji.* Both are incorporeal forces of creation more ample than Heaven and Earth, and transcend mortal comprehension. However, in Ricci's Catholic worldview, "material things cannot come to completion of their own volition, but must have a cause external to them to bring them to fruition" (Ricci 77): he argued that something must impose order on those which lack intelligence before they can perform acts of intelligence, and the external provider must be God. In other words, the universe needs something to launch it into action because nothing is capable of producing itself, and God is that First Mover. This contrasted with the Chinese belief that all things were inherently intelligent because of *li*, which guided everything. The Chinese saw no opposition or boundary between the self and the world, the mind and the body, the divine and the cosmic, and thus did not understand the distinction between spirit and matter. The missionaries, on the other hand, thought that such distinctions were fundamental and self-evident: they separated the soul from the body, and insisted that the soul guided the body (Ricci 73). In his catechism, Ricci reasoned that inanimate objects (which lack souls) still function in an orderly manner because they are given intelligence, and that external provider must be God.

Ricci disapproved of what he viewed as the Chinese equivalent of God, *Taiji*, because it was an "accident" that could not create other things. This disapproval stems from the Aristotelian division of the world into two big groups: substances, which exist independently, and accidents, whose existence relied on others. Ricci also believed that an inferior accident could not create a superior substance for "a result cannot be greater than its cause". In his catechism, *The True Meaning of The Lord of Heaven* [天主實義], Ricci wrote that *Taiji* could not be the source of all things because it was an accident, and thus could not transcend its powers by so much and create something superior, and certainly not the myriad of things. However, Ricci misunderstood the concept of *li*: as the Chinese did not have the Aristotelian concept of substances and accidents, they believed that both could contain *li* (Ricci 111).

In response to Ricci's points about *Taiji* and the Christian argument about the necessity of a Master of Heaven to direct and govern the universe, resulting in the creation of all things, many Chinese scholars questioned Ricci's understanding of *Taiji*. They argued that all beings were born through the fusion, disintegration, and transformation of *Yin* and *Yang*, citing *Taiji* as the force that pushed it all into motion. One Chinese scholar countered the Western simplification of *Taiji* to several diagrams and their claims about its lack of intelligence, and thus inability to direct the myriad of things:

> *Yi* 易 (the change which produces infinite combinations of *Yin* and *Yang*) is a natural power (*benxing* 本性) of perfect intelligence. Without reflection, without intention, in absolute calm, without agitation, it reacts and its effects are

> communicated. But this intelligence does not really direct the ten thousand transformations; if there were some being directing them, those transformations would all be good and fortunate whereas they sometimes turn out to be bad and bitter
>
> (quoted in Gernet 212).

To prove that God was the rightful and supreme creator, Ricci also appealed to the spiritual side of the Chinese to support his point: he argued that our innate veneration of "One who is regarded as worthy of supreme honour" indicates that there is One who is "highly honoured and able to govern the hearts of men and cause them of themselves to honour Him" (Ricci 73). Ricci also argued that there can only be one God, because having two Creators complicates matters: firstly, it is difficult to determine the superiority or inferiority of the "lords" in relation to each other. Secondly, there is no need for two Creators if one is universal and ultimate. Thirdly, a supreme ruler is needed to maintain order amongst the myriad of things to prevent them from inevitably dispersing, resulting in destruction. Fourthly, having two supreme rulers might lead to anarchy due to power struggles (Ricci 89).

Xu Dashou 許大受, a late Ming scholar, rejected Ricci's conception of God as supreme Creator because the Creator is likened to a workman: "How is it possible to go so far as to denigrate Heaven to the point of likening it to a workman and, quite without basis, attribute to him the creation of man and woman?" (Gernet 209). He also said that God was inferior to the original virtue of Heaven because it was tireless; God, on the other hand, was exhausted after working for six days and six nights, and could not even fill up the entire universe, as much space is left unoccupied outside the realm of the nine crystalline spheres, an idea to which we shall return later (Gernet 213).

Xu's argument is representative of Chinese literati of his time. God's creation of the world implies that Creation was a result of "feeling and knowledge, action and an object of the action" because the missionaries believed that will, reflection and intelligence are closely associated — as stated above, he is an interventionist god. The Chinese, however, viewed creation [*zaohua* 造化] very differently. Classical Chinese texts state that Heaven acts without intention [*wuxin* 無心] and in total impartiality: its lack of egoism is the reason for its dignity and its greatness, thus proving that it is the superior form of intelligence. The Chinese Heaven is much more indirect in comparison to the Christian God: its action is silent, imperceptible and continuous. According to the Sinologist Jacques Gernet, the Chinese were so opposed to "the idea of a conscious will at the origin of the world and organising it" because it "opposes their beliefs of spontaneous organisation and natural dynamism" (quoted in Gernet 210).

In sum, the missionaries taught of the existence of a static world, created once and for all and limited in both space and time, concepts that they tied in with their theory of the existence of their interventionist Creator. The Chinese, on the other hand, believed in a concept known as universal dynamism, which maintained that the world was the product of ceaseless evolution, limitless in extension and duration, and thus viewed creation as the result of spontaneous, impartial and inherent energies. The controversy regarding the nature of a Creator is the crux of the creation debate, and the main divisions between the two cultures' beliefs.

2. Structure of the Universe

The second conflict between Chinese and Western cosmology is their theories of the structure of the universe.

The Chinese held the belief that the world came together or disintegrated because of the fluctuations of an omnipresent, universal energy, and that it underwent a constant, ceaseless evolution. They also thought of the universe as an infinite space where heavenly bodies resided. The Jesuits' picture of the world differed greatly from the Chinese: initially they preached the closed Ptolemaic-Aristotelian geocentric model of the solid crystalline spheres, which places the earth in the centre of the universe, and states that it does not rotate on its own axis or orbit any other celestial body (see Figure 1). The other eight spheres, which are made of a transparent material called aether (or quintessence), revolve around the earth. The immobile outermost heaven is where God, his angels, and the fixed stars resided.

In his letters, Ricci compiled a list of the supposed "absurdities" of the Chinese (Needham 2).

1) The earth is flat and square while the sky is a round canopy.
2) There is only one sky instead of ten, the skies are empty and not solid, and the stars move instead of being fixed to the firmament.
3) They did not understand the concept of air, and thus said that there is void between the spheres instead of aether.

4) The Chinese have five elements instead of the Western four, replacing air with metal and wood, and believe that the elements engendered one another.
5) During eclipses of the sun, the moon diminishes the light of the sun when it is near it.
6) The sun hides under a mountain near earth at night.

This clearly demonstrates that Ricci, like many other Europeans, firmly believed in the superiority of the Western sciences (Needham 6-7), and that he tried to force his world-view on the Chinese.

At first, most Chinese scholars fundamentally opposed the theory of the crystalline spheres because they believed that the universe was an infinite space, and because the concept of "aether" did not exist in China (Needham 2). Xu Dashou, who shared the views of a large group of fellow Chinese literati at the time, disliked the Aristotelian concept of delimiting the Great Void, and of closing the universe in. He also disliked how Jesuits restricted the time scale of the universe, believing that they were recognising the present but not the past.

Over time, however, some Chinese scholars accepted this theory because Ricci pointed out that it coincided with Qu Yuan's 屈原 *Chu Ci* 楚辭 *[The Songs of the South]* description of the universe, which mentions *Jiu Chong Tian* 九重天 [nine heavens]. In the Qing Dynasty, many prominent commentators of the *Chu Ci* referenced and affirmed Ricci's interpretation in their commentaries (Chang 116-118).

Ironically, Europe was just beginning to move away from the antiquated system of the crystalline spheres as the Jesuits went to China (Needham 2). By the 1630s, the Jesuits were using Tycho Brahe's hybrid geo-heliocentric system, which dictates that the Sun revolves around the Earth, while all the other planets revolve around the Sun (Figure 2). Although this system clashes with the theory regarding the structure of the crystalline spheres, it continues to use a round orbit for calculations, a compromise the Chinese astronomers happily accepted. And thus the initial disagreement between the Chinese and Christian understanding of the physical structure of the universe was resolved because both sides made one concession: the Chinese adopted the doctrine of the "nine heavens"; the missionaries accepted that the theory of the crystalline sphere had errors.

3. Shape of the Earth

The third major point of conflict between the Chinese and the Jesuits is the shape of the Earth.

The Chinese believed in two main theories about the shape of the Earth and Heavens. The first is the Theory of the Vaulted Heaven [*Gaitian* 蓋天], which states that Heaven is a half dome, like the oval umbrellas on ancient carts, and that the Earth is square like a chessboard (Figure 3). The second is the Theory of the Spherical Heaven [*Huntian* 渾天], which states that the Heavens are round and envelop the square Earth like the egg white in an egg (Figure 3), but the Earth itself is not round (Chu 9). Although the schools clashed often, both agreed that the earth is flat.

The West, however, believed that the Earth was round: according to Aristotle's four elements theory, fire and air rise while water and earth sink, so the Earth must be round because it naturally moves down (Chu 5-6).

To convince the Chinese otherwise, Ricci drew and presented the *Map of the Ten Thousand Countries of the Earth* 坤輿萬國全圖 (see Figure 4), which served as a gateway to Western cosmology and calendrical calculation. He also tried to equate the foreign concept of the round Earth to sayings in classical texts, and claimed that the comparison of the earth to the egg yolk in the Theory of the Spherical Heaven actually alluded to the shape of the Earth instead of the relationship between heaven and earth. He also suggested that the *Zhoubi Suanjing* 周髀算經, an ancient Chinese text on mathematics and astronomy, explained the flat Earth in terms of the virtues and characteristics of Earth instead of its superficial qualities. Ricci tried to convince the people that the ancients believed that the earth was round, and that their successors had misinterpreted their writings. His argument sowed the first seeds of the theory that Western thought originated from China (Chu 21).

Ricci advanced his argument by listing various observable astronomical phenomena as proof, and also by quoting his travelling experiences (Chu 21-22):

1) He said that when you head north or south for 250 *li* 里 (a Chinese unit of measurement, approximately 500 meters), the height of the north star will increase or decrease by one degree.
2) He also said that every thirty degrees east or west from the prime meridian, the time difference is two hours, and that two people on the same longitude would see the same phenomenon at the same time.

3) During the missionaries' journey to China, they passed through the Cape of Good Hope, which according to his reckoning was situated at 36° South latitude, almost the antipode of China. Therefore, from the Chinese' standpoint, those on the Cape would be "upside down". However, he argued, the sky was still above his head, and he did not fall off.

Ricci's world map was extremely influential. At first the people viewed the earliest 1602 edition as a curiosity rather than an important transfer of knowledge. This was part of Ricci's strategy to integrate Western concepts into China, because if they often interacted with, it would soon become part of their common knowledge. The map eventually attracted the attention of the Wanli emperor 萬曆皇帝. Although he may have lamented that the map presented far more territory than was known to the Chinese before, he believed that possessing the map of the world meant that he ruled it, which added to his prestige and further proved his divine imperial right [*tianming* 天命] (Chu 33).

The map also elicited several different interpretations from literati. Those open to Ricci's theory endorsed him in two ways: proving his moral calibre and validating or extending his claims. One such example is Yang Jingchun 楊景淳, who thought that Ricci's map induced the curiosity of scholars, and opened their eyes to the world (Chu 31). Another notable supporter of his was Feng Yingjing 馮應京, who used a popular contemporary school of Neo-Confucian thought, the so-called philosophy of the heart 心學, to interpret Ricci's God. He believed that a higher power gave us our heart, and that our hearts are united and unlimited. He was astounded that despite the disparities between such vastly different civilisations, they were still able to "come together as one" [六合一家，心心相印, quoted in Chu 31]. He thought that the map also represented one of the myriad versions of people's common humanity, using Neo-Confucian beliefs to endorse the credibility of Ricci's map and God (Chu 32).

Li Zhizao 李之藻 was another prominent political figure and scholar who sided with the Jesuits. He shared Feng's sentiments, proclaiming that the map caused him to value his life, and motivated him to work harder to seek the whimsical Dao. Both Feng and Li wrote inscriptions in response to Ricci's to encourage people to strive to achieve a virtuous life. He also wrote inscriptions for Ricci's map, and stated that the round earth was a product of careful observation of the Earth and Heavens, and, any close observer of the skies would arrive at the same conclusion (Chu 32). Li mainly defended Ricci's virtues to prove the credibility of his claims, and so they would seriously consider Ricci's theories despite his identity as a foreigner.

Xu Guangqi 徐光啟 defended Ricci by proving the validity of his claims. His arguments are a series of "as ifs" (Chu 15):

1) If the earth was flat, there would not be changes in the latitude and longitude.
2) If the earth was flat and the latitude changed, it would extend forever, and the earth would eventually collide with the sky.
3) He supported the reinterpretation of the *Zhoubi* explanation using the Theory of the Spherical Heaven as proof.

Interestingly, endorsing Ricci's round Earth theory, Xu also asked why the great astronomers of the Yuan Dynasty did not accept the round Earth concept, which was known to them thanks to the mediation of Muslim astronomers from Central Asia. Could they have deliberately supressed the truth, thus causing their Calendar to be inaccurate? In doubting the good faith of the great Chinese astronomers, he called into question the credibility of their theories, and in extension, the entire Chinese calendrical calculation system (Chu 28).

Others, however, were not so receptive of Ricci's teachings. One of his main opposers was Yang Guangxian 楊光先, a literatus without official post who was vehemently against Christianity and determined to bring the Jesuits down. In 1661, he published a paper titled *Niejing* 孽鏡 [Demonic mirror] criticising the Western notion of the round Earth in response to Johann Adam Schall von Bell's atlas, which was an adaptation of Ricci's.

1) Yang argued that if the Earth was round, those at the bottom would either fall off or drown, because the seas would naturally pour and overflow to the bottom. If it were indeed round, he added, it would not be able to stand still in space, and would crush the men who had fallen off. He proposed a challenge for the Jesuits: if Schall could tilt a basin of water sideways and stop the water from spilling out, he would believe that the Earth was round.
2) He thought that the moon did not emit light, and that if the Earth was round, the Moon should not have different phases. Using the

visibility of the Moon and Sun during different times of the day as proof, he argued that a round Earth would block the Sun, but it clearly did not.

3) He did not believe that the Jesuits really sailed around the world, and contended that they exaggerated the distance of their travels because it only appeared to be half a trip around the globe from Europe to China on their world map. He added that the Chinese could see through the Jesuits' apostrople lies about the Southern hemisphere, but because they had never been there, could not concretely disprove the Westerners' fabricated stories (Chu 58-59).

The missionaries were taken aback by Yang's arguments because no one had doubted their travels before, and also because their explanations naturally rebuffed his points. His arguments may sound preposterous to the modern reader; however, considering the notion of gravity did not exist yet and the distance between the Sun, the Moon, and the Earth in traditional Chinese cosmological theories were much shorter than in the West, his doubts were very intuitive and logical ones. Missionaries could not rebuke him because they could not realise his "experiments" (Chu 59). Thus the missionaries and Yang and his group of dissenters found themselves in an odd position: because he ignored the Jesuits' evidence and the fundamental facts their theories were based upon, nothing they said could convince him nor he them.

However, decades later, many traditional Chinese scholars struggled to comprehend the implications of the Earth being round, not to say the missionaries' explanation for its sphericity. In 1672, a notable missionary named Verbiest conversed with notable scholar Li Guangdi 李光地 about the Earth being round. Li replied that whether the Earth was round or not did not matter to him — he cared more about the symbolic meaning. To him, it did not matter if China really was in the centre of the world or not: it was still the most important, and its superiority manifested itself in its arts and culture (Chu 63).

Out of the three cosmological ideas discussed in this paper, the debate regarding the physical shape of the Earth is the most applicable in everyday life. A complication that hindered the interactions between the missionaries and the Chinese was the medium of transmission: the explanations of the shape of the Earth were also expressed in diagrams, and not just the texts. However, due to the difference in tools and mapping conventions, the two cultures did not read or draw maps in the same way; consequentially, it was hard for the two sides to successfully communicate with each other.

Conclusion

This paper has chosen to analyse the Chinese literati's response to three key aspects of Christian cosmology (creation, the structure of the universe, and the shape of the Earth), as introduced by the Jesuits in the late Ming Dynasty. In regards to creation, the main clash between the two cultures is their perception of the Creator: the Chinese believed that the universe was the product of spontaneous, impartial, omnipresent and inherent energies, and that all things were inherently intelligent because they were endowed with these energies; the missionaries, however, believed in an omniscient, all-powerful Creator who governed and bequeathed intelligence only to certain beings. The debate about the structure of the universe, too, arose because of the fundamentally antithetical world-views: the Chinese believed in universal dynamism, resulting in the notion of the universe as an infinite space where heavenly bodies resided; the Jesuits thought the world was static, limited in both space and time, and preached the model of the bound crystalline spheres. On the shape of the Earth, the Chinese asserted that the Earth was square and flat, while the missionaries believed that the Earth was round.

The Chinese literati's attitudes to the influx of new ideas differed across an expansive spectrum: some scholars and officials supported Ricci, while others vehemently protested all aspects of Western religion and science. This raises the question: why did some choose to accept these foreign concepts, while others rejected them?

The process of accepting new ideas is a complex one. The Chinese were more inclined to accept the missionaries' arguments if they could associate those arguments with their classical texts, which suggests that putting a foreign concept in a familiar context is one of the critical steps in accepting something new. Although Ricci did misinterpret some elements of the Chinese classics, he understood the importance of tailoring his teachings to suit his audience, and studiously toiled away at the Chinese language and the classical texts, even incorporating many traditional sayings into his catechism.

It is also important to note that truth is rarely the sole determinant in adopting new beliefs, and both the process of deciding what is true, along with the

adoption and integration of new ideas, have many political ramifications. Certainly, many Chinese literati genuinely rejected the missionaries' teachings because it challenged the deep convictions instilled in them since childhood. More significantly, many of them were well versed in Chinese history, and knew the political consequences of changes in beliefs, as seen in the reforms of Wang Anshi in the Northern Song Dynasty. The acceptance of new beliefs, in particular a new religion or school of thought, could undermine, or even vitiate, the prevailing political and power structure on which they thrived. The root of power was a hierarchical society based on an officialdom selected through a rigid imperial examination system [科舉制度] in scholarship of traditional Chinese learning, the study of officially approved traditional Chinese philosophy, values, texts, and norms.

Christianity is not just a religion: it is a comprehensive system of beliefs spanning from philosophy to politics, but also a way of life. The rising influence of Christianity threatened the positions of many of those in power, and thus a number of Chinese literati were so adamant against the missionaries' teachings believing their theory to be false and striving instead to uphold their traditions. There was far more at stake because they were also defending the status quo, their vested interests, and, to a certain extent, their survival.

However, there is also a more positive way of assessing this story. History has shown that through constant evolution and development in science and thoughts, different cultures will eventually find common ground, even if serious conflicts do occur at some point. This is illustrated in the second clash: later on, the Chinese accepted the Western doctrine of the "nine heavens", while the missionaries realised that their original theory of the crystalline spheres was flawed. We are entitled to decide for ourselves whether such conflicts are only transient in the grand scheme of things. Contrary to popular belief, the Jesuits' introduction of new ideas did not "destroy" traditional Chinese beliefs; instead, the missionaries challenged the Chinese' existing ideas, and in doing so, made them reconsider their basic concepts, thus advancing their understanding of the universe.

Ricci exemplifies all of the above. He was an optimist who believed in the natural goodness of humanity, and held the belief that Christianity would enrich Chinese culture instead of harm it.

Figure 1. The Ptolemy-Aristotelian geocentric model of the solid crystalline spheres.

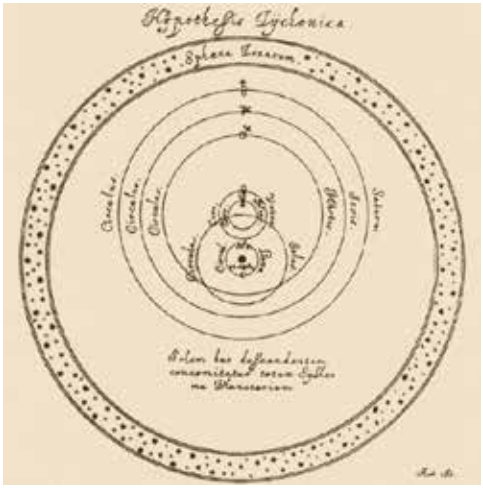

Figure 2. Tycho Brahe's hybrid geo-heliocentric system.

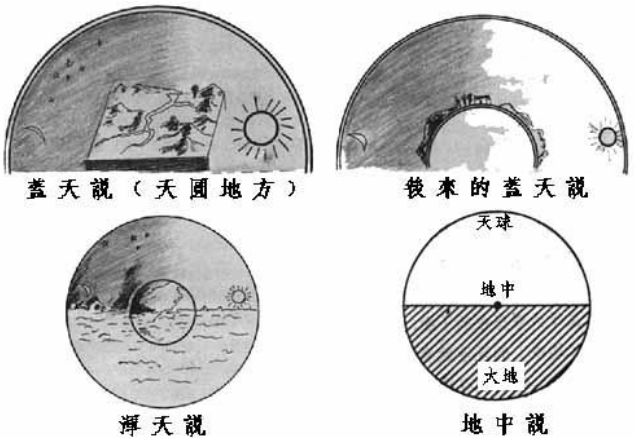

Figure 3. Theory of the Vaulted Heaven [蓋天] vs Theory of the Spherical Heaven [渾天].

Figure 4. The Map of the Ten Thousand Countries of the Earth [坤輿萬國全圖].

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What can a Comparison between Plato and Xunzi's Justifications of the State Reveal about the Raison d'être of Society?

Eugenie Yuzhen Ng

Introduction

Reflecting upon the necessity of society is key to understanding why collective living has persisted throughout the history of humankind. The reasoning behind the existence of society may depend on one's opinion of human nature; the feasibility of a community naturally depends on how innately peaceful or chaotic humans are. By justifying why humans are sensible, or conversely, why humans are villainous, one may explain why society is desirable or undesirable. Accordingly, renowned philosophers Plato and Xunzi 荀子 demonstrated in their philosophical works how their beliefs about human nature influenced their justifications for the existence of the state. Upon close comparison, their respective justifications demonstrate that despite Plato's and Xunzi's dichotomous stances on human nature, their justifications for the existence of the state are remarkably similar.

The justifications for the state made by Plato and Xunzi - philosophers from ancient Greece (427-347 BCE) and ancient China (third century BCE) respectively - are underpinned by their respective beliefs about human nature: while Xunzi believes that humans are inherently bad, Plato believes that humans are rational and rationally desire to be good. In light of this difference, it is reasonable to ask: does the state exist for the benefit of humanity, making the state intrinsically good, or is it a necessary evil, to save innately wicked humanity from itself?

In order to explore the relationship between their stances on human nature and their justifications of the state, this paper will first discuss how the political circumstances the two philosophers lived through may have shaped their philosophy. Plato and Xunzi's justifications of the state will then be explored and subsequently compared, in order to elucidate the extent to which their belief concerning human nature influenced their justification of the state. Additionally, once it has been established why we need a state, the 'ideal state' of each philosopher will be explored to provide insight about how a state should be organized.

Ultimately, this paper aims to substantiate the argument that Plato justifies the necessity of a state overseen by philosopher-kings through the principle of specialisation, while Xunzi justifies the state through the necessity of sage-kings to cultivate goodness in the innately corrupt people. The comparison between these two philosophers of different backgrounds may reveal the universality of society, as well as how, despite their differing opinions, the two can agree that the state is necessary. Such a revelation implies that society is still inevitable no matter what human nature entails. The key question posed by the comparison therefore centres around the purpose of the state: is it designed to amplify or inhibit human traits?

In the context of this paper, a "state" refers to a group of people who answer to a government whose interests and goals align with those of the people (Lewis 78). The very existence of the state has often been taken for granted, but the concept of a governing system actually sets the stage for countless social conventions which shape a large portion of our lives. It is imperative that we question the seeming arbitrariness of our society in order to thoroughly understand the premises upon which it is based.

1. The Political Context of Plato and Xunzi

Firstly, it is important to establish that since Plato and Xunzi lived in different times and contexts, the specific political circumstances they found themselves in naturally shaped their views.

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1.1 Plato

Plato was a citizen of Athens, an autonomous city-state also known in Ancient Greek as a polis. During Plato's time, Athens was governed through a system of unprecedented democracy. All citizens, namely adult male Athenians who had completed military service, would debate motions in the *ekklesia* [assembly] and consequently play a direct role in making decisions and passing laws on how they would live, thereby having active control of the political process (Cartwright).

However, Plato did not seem to view this radical democracy as desirable. To begin with, there were 'casual' executions — executions which were carried out before a complete investigation had been completed — which was the fate that had befallen Socrates, Plato's friend and mentor. Socrates' persecution by ordinary citizens may explain Plato's perception of the sinister aspects of democracy; the reality is that the will of the people would always be prioritised, meaning that monumental decisions need not be right or sensible, but simply popular. In Plato's view, important decisions concerning justice and statecraft ought to be made by experts, not simply anyone who happened to be a citizen. Additionally, Plato believed that democracy would inevitably lead to tyranny, stating in Book VIII of the *Republic* that within a democracy, "unnecessary desires" — desires yearning for luxuries — will be indulged by the rapid inflow of liberty. As a result, once the people have had a taste of liberty, they will repeatedly demand more, possibly even sacrifice social order for the sake of acquiring more freedom. Democratic leaders would then feel that their authority is undermined by the power vested in citizens and therefore, to regain the people's support, the leaders will become increasingly tyrannical and unpopular among the masses, suppressing freedom to maintain their own power.

It is plausible that, because of potential flaws in radical democracy, such as placing too much trust in majority rule and allowing too much indulgent freedom, Plato saw value in prioritising the claims of the state as a whole over claims of the individual for the sake of order; he was convinced that people should not delve into matters outside of their field, and that there should be some system of governance to ensure that only people who were best qualified for a position could occupy said position.

1.2 Xunzi

In contrast to the Athenian state that Plato lived in, there was no concept of democracy in ancient China. Xunzi lived during the time of the Eastern Zhou Dynasty (770-221 BC), when ancient China was broken up into smaller kingdoms ruled by *zhuhou* 諸侯 [feudal lords] who answered to a *tianzi* 天子 [Son of Heaven], the Emperor of China. Thus, states, for Xunzi, were the archetypal *zhuhou* kingdoms. Each state was largely autonomous, eventually causing certain states to yearn for hegemony. Hence, various wars inevitably broke out between the states, leading to the Warring States period. As the states scrambled for dominance to surpass the *tianzi* in power, the *zhuhou* gradually stopped showing deference to the *tianzi* and became more politically independent. It was a time when people exhibited hunger for power and war. It is probable that the bloodthirsty nature exhibited by people in these circumstances informed Xunxi's conception of an ideal state: one which controls the people and prevents violence. Therefore, Xunzi may have arrived at his famed conclusion, 'human nature is bad', due to the destruction and conflict manifested by the people of his time.

1.3 Comparing Plato and Xunzi's Political Context

Varied as they may be, the political contexts in which Plato and Xunzi lived seem to play a part in shaping each philosopher's views about the function of the state. Plato's witnessing of the dangers of unchecked liberty may have illuminated to him the need for social order through restriction of freedoms. Meanwhile, Xunzi's experience in the chaotic and bloody Warring States period seemingly informed his belief about human nature: that it is simply bad and corrupt. Accordingly, Xunzi would have seen the need for a state that controls the evil humans, so that peace and order may exist.

2. The Justification of the State

2.1 Plato's Justification

The *Republic* is one of Plato's most renowned works on political philosophy. As with many of Plato's works, the *Republic* is written in the form of a dialogue, presenting various characters discussing and debating with each other about the main topic at hand. Although he never explicitly endorses any of the opinions expressed in his dialogue, it is generally assumed that the character of his real-life mentor, Socrates, has the most authoritative voice within his works.

In Book II of the *Republic* (356b-d), the character Socrates is challenged to defend his beliefs about the nature of justice by the character Glaucon, who poses the notion that all things can be categorised into three categories:

1) things that are good for their consequences;
2) things that are good for their own sake; and
3) things that are good both for their consequences and for their sake.

Glaucon asserts that he, along with many people, would argue that justice should be classified as something that is good only for its consequences: He believes the life of an unjust man is far more blessed than the life of a just man due to the former's ability to escape punishment and enjoy impunity:

> By nature, to commit injustice is a good and to suffer it is an evil… anyone who had the power to do [injustice] would never make a compact with anybody neither to wrong nor to be wronged; for he would be mad.
>
> (Plato 358e-59a [Shorey Trans.]).

He then suggests that we agree to give up our ability to inflict injustice simply so that we can avoid having injustices inflicted on our selves, making justice itself necessary:

> ...those who lack the power to avoid [being wronged while doing wrong] determine that it is for their profit to make a compact with one another neither to commit nor to suffer injustice; this is the beginning of legislation and of covenants between men, and this is the genesis and essential nature of justice — a compromise between the best, which is to do wrong with impunity, and the worst, which is to be wronged and be impotent to get one's revenge.
>
> (Plato 359a-b [Shorey Trans.])

Nobody actually desires justice for its own sake because acting unjustly produces greater personal benefits. From this, Glaucon essentially provides a cynical outlook on the formation of a community or state: a state emerges from a compromise made between weak people who fear that suffering injustice is worse than doing it.

In response to Glaucon's argument, Socrates' challenge is to establish that justice belongs to the third classification of things: things which are good for both their consequences and for their own sake. Socrates' claim about justice's desirability subsequently explains why people are able to cooperate to form a state.

Socrates first asserts that justice is 'the having and doing of one's own and what belongs to oneself' (434a). He then demonstrates what justice might look like in society by first examining what justice means in the context of the individual's soul. He claims that each person has a soul that consists of three parts: a rational part (aided by wisdom) which rules; a spirited part (armed with courage) which causes people to experience strong emotions; and the appetitive part (regulated by temperance) which is accountable for human desires (see Figure 1). A just soul is a soul whose parts know each of their own functions and work in unison harmoniously (Stoneman).

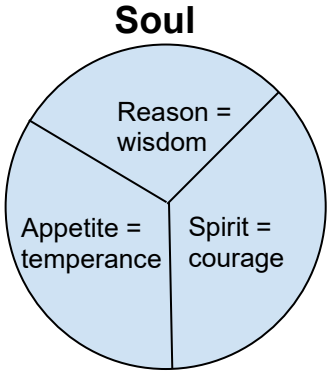

Figure 1. Plato's conception of the tripartite soul

Therefore, it is justice that preserves harmony within the soul, making justice good for its own sake. It is also good for its consequences because it enables cooperation:

> Do you think that a city, or bandits, or any other group that attempted any action in common, could accomplish anything if they wronged one another?' 'Certainly not,'... 'For factions are the outcome of injustice... but justice brings oneness of mind and love.
>
> (Plato 351c-d [Shorey Trans.])

If justice enables harmony within a group of individuals as well as within one's soul, then by this logic, justice is desirable because it enables cooperation between individuals within a city, and also because it enables healthy souls.

Having established that justice is desirable for its own sake and for its consequences, Socrates then divulges that justice enables cooperation between individuals within a state; the formation of the state is founded

upon humans' ability for co-operation which is facilitated by justice:

> A state comes into existence because no individual is self-sufficient; we all have many needs. Having such needs, we call upon one another's help to satisfy our various requirements; when we have collected a number of helpers and associated to live together in one place, we call that settlement a state.
>
> (Plato 369b-c [Shorey Trans.])

Hence, according to Socrates, a state comes into being to allow humans to reap the benefits of cooperation, as opposed to Glaucon's proposed social contract theory which argues that a state comes into being simply to prevent humans from savagely killing one another. Socrates views humans as perceptive enough to realise their limitations and respond by collaborating to best fulfill their needs. An individual simply cannot possess the adequate time, resources or ability to satisfy wants such as food, shelter, and clothing, thus people co-operate in order to fulfill others' needs in a particular way, all the while having their own needs fulfilled by others. Having individuals focus on doing one specific job for the community enables everyone's needs to be sufficiently met. Such is Plato's central reason for the state, the Principle of Specialisation.

Plato essentially paints humans as rational beings who understand the essentiality of cooperation. He does so by having Socrates present why justice is desirable and humans co-operative, countering Glaucon's argument that humans are naturally selfish and unjust, forming a state out of fear of suffering injustice. It is clear that Plato's primary motive for the formation of a state is not to simply protect people from one another, but to provide an environment for the fostering of social relations, so that people's needs may be best fulfilled through cooperation. Because people recognise their own capacitive limits, they utilise labour specialisation to fulfil their individual needs to the fullest extent.

2.2 Xunzi's Justification

Xunzi is best known for his collection of philosophical writings called *Xunzi* 荀子, in which he notably discusses the importance of propriety and governance. His view of human nature is extensively explored in Book 23, in which he candidly establishes his core belief of humanity:

> People's nature is bad. Their goodness is a matter of deliberate effort.
>
> (*Xunzi* 23.1 [Hulton Trans])

Xunzi justifies his claim as follows:

> People's nature is such that they are born with a fondness for profit in them. If they follow along with this, then struggle and contention will arise, and yielding and deference will perish therein. They are born with feelings of hate and dislike in them. If they follow along with these, then cruelty and villainy will arise, and loyalty and trustworthiness will perish therein… Thus, if people follow along with their inborn dispositions and obey their nature, they are sure to come to struggle and contention, turn to disrupting social divisions and order, all the while throwing proper form into chaos and ultimately reverting to brutal tyranny.
>
> (*Xunzi* 23.1 [Hulton Trans.])

Xunzi's solution to prevent people's innate temperament from causing chaos is promptly introduced:

> So people are in need of the transforming effects of teachers and models, and the guidance of ritual and *yi*. Only then will they exhibit yielding and deference, turn to proper form and order, and end up becoming controlled.
>
> (*Xunzi* 23.1) [Hulton Trans.]

The aforementioned "guidance of ritual", also known as a ritual system, serves to clarify and promote social distinction so that people know their obligations, privileges, and status. As a result, they will conform to their role, thus maintaining social harmony. By introducing the ritual system into society through the formation of a state, people are able to overcome their inborn dispositions and society can become ordered.

Ritual and *yi* are critical to making people who are savage conform to goodness, thus a state needs to be formed in order to implement these miraculous virtues of ritual and *yi:*

> Having a fondness for benefit and desiring gain are people's inborn dispositions. If one should allow their nature to get the better of themselves, even brothers will struggle with each other for the sake of personal gain. However, if transformed by ritual and *yi*, then they will even pass up the opportunity for gain to their countrymen.
>
> (*Xunzi* 23.9 [Hulton Trans.])

In order to implement ritual and *yi* to control the people, sage-kings, who have reached sagehood and

are therefore unaffected by their savage human inborn dispositions, will implement ritual and *yi* in their laws and measures:

> In ancient times, the sage-kings saw that people's nature is bad. Therefore, for the people's sake, they set up the power of lords and superiors in order to oversee them. They made ritual and *yi* clear in order to transform them. They set up laws and standards in order to make them well ordered. As a result, they caused all under Heaven to come to order and conform to goodness. Such are the ordering influence of the sage kings and the transformative effects of ritual and *yi*.
>
> (*Xunzi* 23.12 [Hulton Trans])

To further reinforce that the state is necessary precisely because human nature is inherently bad, Xunzi addresses an argument raised by Mencius 孟子, a fellow Confucian philosopher from the 3rd century BCE. In doing so, he makes the point that if people's nature were naturally good, there would actually be no warrant for sage-kings, nor ritual and *yi*:

> ...does [Mencius] really think that people's nature is originally correct, ordered, peaceful, and controlled? Then what use would there be for sage kings? What use for ritual and *yi*? Even though there might exist sage kings and ritual and *yi*, whatever could these add to its correct, ordered, peaceful, and controlled state? Thus, in ancient times the sage-kings saw that because their nature is bad, people were... not well-ordered. Therefore, for the people's sake they set up the power of lords and superiors in order to oversee them.
>
> (*Xunzi* 23.12 [Hulton Trans])

Hence, Xunzi establishes that a state is needed because people's inborn dispositions are corrupt and selfish; if left to their own devices, destructive behaviour will naturally arise and run rampant, destroying order. Therefore, wise and principled governing authorities need to be present to implement measures to restrain the people. The authorities' implementation of laws is the foundation for the creation of a state.

2.3 Comparing Plato and Xunzi's Justifications of the State

While Plato and Xunzi both agree that the state should exist, they provide differing reasons as to why this should be the case: Plato's reasoning is driven by the assertion that humans are rational enough to recognise the advantages of cooperation, and that being just is good for one's internal harmony. Therefore, the primary function of the state can be defined as optimistic, since it doesn't merely prevent inherently savage humans from killing one another as Glaucon's "social contract" suggests.

Xunzi, by contrast, seems to share more with Plato's character Glaucon, in that he believes humans are inherently evil. Hence, his conception of the primary function of the state is more cynical and pessimistic, designed to limit for the sake of implementing proper measures that enforce order. The disparity between the philosophers' rationales originates from their core judgement of human nature which were influenced by their own political contexts, causing Plato's state to have an enabling force, while Xunzi's state has more of a restraining force.

Additionally, both philosophers seem to value social order above all else, with Plato emphasising the need for every citizen to refrain from straying outside of their designated duties for the sake of maintaining productivity and social order. Similarly, Xunzi necessitates a hierarchical relationship between the sage-king and the people in order to maintain social harmony. This commonality suggests that to them, the state and the notion of hierarchy seem to be inseparable, as both philosophers advocate social divisions in order to support the operation of the state.

3. The Ideal Structure of a State

The need for sage kings, ritual and *yi*, as expressed by Xunzi, and the need for specialisation, as expressed by Plato, suggest a specific structure which would be most suitable for achieving the goals of the state. Specifically, both philosophers advocate a hierarchical structure for their ideal state.

3.1 The structure of Plato's Ideal State

As Book II continues, Socrates describes the ideal structure as that which is conducive to ensuring that people adhere to their given roles within the *Kallipolis* ["beautiful city"]. *Kallipolis*, his ideal state, is built on the Principle of Specialisation which essentially introduces a hierarchy:

> The needs of all are best met if each can perform his own work as common for them all. Once people stop seeing everyone else as competition for what they need, and start to cooperate to fulfil their needs, specialisation of labour is required for the needs of all to be fulfilled in the best available ways.
>
> (Plato 369e [Shorey Trans.])

Ideally, jobs are allocated according to each person's aptitude and ability, so that each can work as productively as possible in their respective jobs. Social divisions are therefore introduced from the state's need to assign to each person different duties and statuses.

As aforementioned, justice within the city involves members of each class adhering to their given roles. Thus, to ensure justice in the city, the principle of specialisation is needed: it states that people should conform to their given role which they are naturally best suited for in order to work harmoniously with others for a common good. Having people know and accept their social standing is vital to maintaining the status quo, while also ensuring that the state can effectively carry out its functions and not fall into disorder.

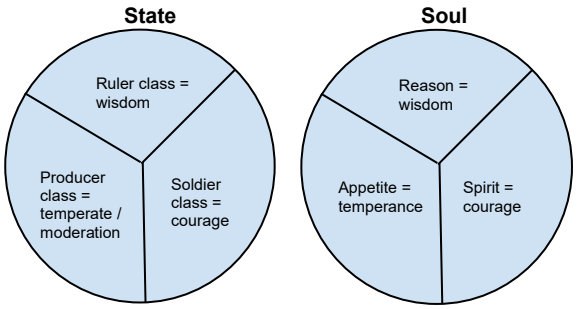

Figure 2. The tripartite state and the tripartite soul

The different social divisions in the *Kallipolis* are explored in Book IV of the *Republic*. The state, just like the soul, is conceived of as comprising three vital traits - wisdom, temperance and courage - which are represented in the state by the three social classes found in the *Kallipolis*: the guardians, the soldier class and the producers. Wisdom in the city is found in the ruling class (the guardians), as wisdom is the type of knowledge that enables them to rule the city well. Courage is found in its soldier or auxiliary class, who defend the city. Temperance and restraint are practiced by the catch-all producer class, which includes all professions other than auxiliary and guardian, and is tasked with obeying whatever the rulers decree. Collectively, justice is found in the city when all three classes perform their assigned functions harmoniously:

> If the artisan, the auxiliary and the guardian concentrate on their own business and each has his own function in the state, as opposed to what we were just saying, that would be justice and would make the state just.
>
> (Plato 434c [Shorey Trans.])

Additionally, self-discipline in the city stems from its unanimity in agreeing on who should rule and who should be ruled, and in this case, the rational Guardians rule over the other social classes, similar to how the rational part also rules in a tripartite soul. Seeing that the precondition for a just state is the three classes carrying out their own roles, and knowing that the Guardian class is charged with ruling over others, Plato contends that a hierarchy, with the Guardian class at the top, must be a prerequisite for a just state.

Referring back to Platonic justice, where justice is the having and doing of one's own, an unjust state emerges when the classes fail to work harmoniously and are imbalanced, therefore failing to complete the functions of a state. Hence, to maintain a functioning, just state, a social hierarchy is needed to divide the three classes and ensure they know their place in society: to rule or be ruled.

> The state can only be happy when all do what is appropriate… if the Guardians neglect the Principle of Specialisation and seek inappropriate tasks and ways of being happy, then the state as a whole is doomed. They must preserve the state by preventing extremes of wealth and poverty. Only if this is done is there a state at all.
>
> (Plato 420b-421c [Shorey Trans.])

As indicated by the quote above, the guardians, as the ruling class, are charged with greater responsibility for maintaining the state; the functioning of the state is dependent on them executing their duties correctly. The producing class and the auxiliary class, by contrast, do not rule, highlighting the disparity between responsibility which corresponds to the hierarchical structure of the just city.

The presence of a hierarchy in the *Kallipolis* is further evidenced through Socrates' assertion that social mobility, which is only possible if social divisions already exist, is detrimental to the state. He states that citizens diverging from their assigned class and exercising (or even attempting) social mobility will disrupt the status quo, undermining social order.

> Whenever a born craftsman or any other wage earner… tries to enter the military class, or one of the military class tries to get onto the council or into the guardian class, even though he is not qualified to do so... then I think this kind of substitution and meddlesomeness is the ruin of a state.
>
> (Plato 434a-b [Shorey Trans.])

Lastly, it is apparent that in direct contrast to the democratic system in which he lived, Socrates suggests that the ruling class, owing to their required expertise, ought to be small in number. This provides a notable class distinction for the guardians:

> Would not these rulers be the smallest of all the groups of those who possess special knowledge and receive distinctive appellations?' 'By far.
>
> (Plato 428e [Shorey Trans])

It is clear from the necessity of social distinctions between classes, and from the heightened responsibility the Guardian class possess over others, that a hierarchy is present in Plato's ideal state, for the benefit of the state's efficacy in fulfilling people's needs.

3.2 The Structure of Xunzi's Ideal State's

The belief that a hierarchy is paramount to the structure of a state is also shared by Xunzi. Xunzi, like most philosophers from the Warring States period, believed that the government should be a monarchy, since that was the predominant form of governance in ancient China. This being the case, in Xunzi's eyes, the inclusion of a hierarchy within a state does not require further justification. A monarchy naturally entails a hierarchy. While there was no notion of being able to replace a ruler, checks on the different layers of society can still be imposed, which is partly the function of the ritual system.

The ritual system, also known as *li* in *Xunzi*, is the guidance which outlines one's obligations and privileges given one's social status, and which plays an integral role in ensuring the proper adherence to a role. Since the ritual system essentially emphasises "doing according to one's title", the aim of the ritual system can be effectively carried out by a hierarchy, seeing as a hierarchy precisely distinguishes disparities between social strata. As *Xunzi* makes clear, such social distinctions are vital, both for the purposes of ensuring peoples' adherence to their given roles and also to ensure the very existence of society as a whole:

> In order for people to live, they cannot be without community. If they form communities but lack social divisions then they will struggle with each other. If they struggle with each other then there will be chaos, and if there is chaos they will be impoverished. Thus, to lack social divisions is the greatest harm to people, and to have social divisions is the root benefit for the whole world.
>
> (*Xunzi* 10.4 [Hulton Trans.])

> In ritual, noble and lowly have their proper ranking, elder and youth have their proper distance, poor and rich, humble and eminent, each have their proper weights… The feudal lords wear black dragon-robes and high ceremonial caps… The regular officers wear fur caps and plain robes.
>
> (*Xunzi* 10.3 [Hulton Trans.])

Within the ritual system, there is established guidance concerning what people from each rank are entitled to wear, and how they should act and behave.

Specific traits are attributed to specific roles within the society, with all the roles having one common prerequisite trait, which is to act according to the ritual system. Xunzi postulates that in order to embody any sort of societal role well, the key is to know your place, and to not depart from the exalted standard.

> If social divisions are not yet set, then take control of illuminating the proper bonds.
>
> (*Xunzi* 9.1 [Hulton Trans.])

> For the young to serve their elders, for the lowly to serve the noble, for the unworthy to serve the worthy — these are *yi* for all under Heaven.
>
> (*Xunzi* 7.8 [Hulton Trans.])

The subservience of an "inferior" demographic to its "superior" counterpart clearly signifies the existence of a hierarchy. Xunzi's proclamation that such subservience is *yi* - which is translated from *zhengyi* 正義 [justice] — suggests the attractiveness of having a hierarchy. Furthermore, Xunzi divulges the different levels of rankings in an ideal hierarchy:

> Even the sons and grandsons of kings, dukes, gentry, and grand ministers, if they cannot submit to ritual and *yi*, should be assigned the status of commoners. Even the sons and grandsons of commoners, if they… can submit to ritual and *yi*, should be assigned the status of prime minister, gentry, or grand ministers
>
> (*Xunzi* 9.1 [Hulton Trans.])

There is a clear division between kings, dukes, gentry and grand ministers, who constitute the upper ranks, and commoners, who constitute the bottom of the social ladder. Moreover, the ability for one to fall or rise through their ranks, exercising social mobility, reinforces the existence of the hierarchy.

Xunzi believes that hierarchical divisions are vital to the state:

> Humans are born having desires. When they do not get the objects of their desire, then they cannot but seek some means of satisfaction. If there is no measure or limit to their seeking, then they cannot help but struggle with each other. If they struggle with each other then there will be chaos, and if there is chaos then they will be impoverished. The former kings... established rituals and *yi i*n order to divide things among people, to nurture their desires, and to satisfy their seeking.
>
> (*Xunzi* 19.1) [Hulton Trans.]

> Ritual and *yi* are the beginning of order.
>
> (*Xunzi* 9.18) [Hulton Trans.]

In the absence of a hierarchy, social disorder is inevitable, as the confusion of hierarchical divisions leads to non-adherence to one's given role. When there is a social hierarchy, statuses and levels of superiority or inferiority can be explicitly assigned, indicating to each individual the obligations and privileges to which they are entitled. Though everyone yearns for the same desires *i.e.* fine food, beautiful clothing, and luxury, the ritual system is able to teach people to practice moderation and self-restraint, by forcing them to only act upon desires that are most appropriate to their rank. As a result, they will not contend for goods beyond their status, mitigating competition between people. The hierarchy crucially carries out the principles of the ritual system by clarifying social distinctions. Hence, a state without a hierarchy would not be able to maintain order, nor would it be effective in cultivating goodness in people.

Xunzi's proposed hierarchical social structure echoes the traditional Confucian family structure, which is also hierarchical. Filial piety, a prominent Confucian virtue, requires one to take care of and respect one's elders and parents. In fact, the Chinese character itself for filial piety, *xiao* 孝 depicts the character *lao* 老 (elderly) on top of *zi* 子 [son], reinforcing the younger generation's support for the older generation (Teon). Filial piety is dependent on a familial hierarchy: youths are expected to defer to their parents, and in Xunzi's belief, the wife is expected to defer to the husband:

> May I inquire about the proper way to be a person's wife?" I say: If your husband follows the dictates of ritual, then compliantly obey him and wait upon him attentively.
>
> (*Xunzi* 12.3 [Hulton Trans.])

It is commonly thought that deferential familial relations are the foundation from which social deference and respect extends; an individual first develops the attitude of care and respect towards their immediate family and extends this same attitude to other members of society, specifically those in authority. Because a ruler is the "father and mother" of the people, one should accord to the ruler the same respect and deference that is accorded to their parents.

Clearly, the hierarchy is integral to the structure of Xunzi's ideal state: the state exists to restrain the people, which the hierarchy does through prompting people to only do according to their title and to conform to existing rules and conventions. The hierarchy in Xunzi's state works in tandem with the ritual system, as the clarification of social distinctions brings about conformity to one's obligations and status. Confusion of roles can then be abated, thereby preserving social order.

3.3 Comparing Plato and Xunzi's Justifications of the Hierarchy

Plato and Xunzi use different approaches to justify their argument. Plato justifies his hierarchy first from the macro-level of the state, and subsequently uses the hierarchy of the state to justify hierarchies or divisions in the soul. Meanwhile, Xunzi's hierarchy seems to originate from the family, a micro-level, before expanding to include the hierarchy of the overall state. The two philosophers' arguments move in opposite directions: Plato's takes the concept of a hierarchy in the state and proceeds to shrink it down to the level of the soul, while Xunzi takes the concept of a hierarchy in the family and enlarges it to the level of the state.

Despite starting off with different premises about human nature, both philosophers arrived at remarkably similar conclusions about the structure of the state. Xunzi's desire for hierarchical divisions is strongly reminiscent of Plato's form of social specialisation, since both concepts require people to act in accordance with their role in the community for the sake of an orderly society. Both philosophers promote a hierarchical system within the state to ultimately ensure that everyone adheres to their given roles. For Xunzi, adherence to one's role achieves social order, while for Plato, one's conformity to specialised labour allows everyone to work harmoniously, ultimately benefiting the state's function and efficiency. Despite their differing reasonings for the state's existence, the mechanisms of their ideal states are undeniably similar.

4. Rulers

At the top of both Plato's and Xunzi's hierarchies is a king of sorts. For Plato, these are the philosophers — kings or guardians, who rule over the other classes in the tripartite state. For Xunzi, sage-kings are the ones who designate teachers and models to instil ritual and *yi* in the people.

4.1 Plato's Philosopher-kings

In Plato's *Kallipolis*, philosophers, being "lovers of wisdom", pursue truth above all else, and thus are best suited to being the rulers of *Kallipolis* because they are the wisest among men. If the auxiliary class makes the state courageous, and the producers make the state moderate, then accordingly, it is the guardians who make the state wise. In Book V of the *Republic*, Socrates asserts:

> Unless… either philosophers become kings in our states or those whom we now call our kings and rulers take to the pursuit of philosophy seriously and adequately and there is a conjunction of political power and philosophical intelligence . . . there can be no cessation of troubles for our states nor, I think, for the human race.
>
> (Plato 473d-e [Shorey Trans.])

To buttress the claim that philosopher-kings are best suited to lead states, Socrates reasons that "those who take office should not be 'lovers of rule'", for when "office and rule become the prizes of contention, such a civil and internecine strife destroys the office-seekers themselves and the city as well" (Plato 521b) [Shorey Trans.]. Philosophers, by contrast, much prefer their own private lives over a political life, to the extent that they "look down on" political life. For this reason, they can be trusted to not pursue political office for their own benefit, and therefore they will seek the good of the city when they rule. (Bobonich 2)

4.2 Xunzi's Sage-kings

In essence, a sage-king is an ideal ruler, who, by combining the virtue and wisdom of a sage with the power of a king, exemplified perfection in governance. Accordingly, sage-kings are an essential component of Xunzi's ideal state, providing the people with a clear example of how to act:

> The lord is a sundial. [The common people are the shadow.] If the sundial is straight, then the shadow will be straight. The lord is a bowl. If the bowl is square, the water will be square.
>
> (*Xunzi* 12.4) [Hulton Trans.]

While sages are only human and still possess the same human nature as everyone else, they are not susceptible to it because they made deliberate efforts to acquire sagehood:

> So, the sage transforms his nature and establishes deliberate effort. In establishing deliberate effort, he produces ritual and yi. In producing ritual and *yi* he institutes proper models and measures… Thus, that in which the sage is like the masses, that in which he is no different than the masses, is his nature. That in which he differs from and surpasses the masses is his deliberate efforts.
>
> (*Xunzi* 23.9 [Hulton Trans.])

4.3 Comparing Philosopher-kings and Sage-kings

Both philosopher-kings and sage-kings decide the quality of the state: the wisdom of the guardian class determines the wisdom of the state as a result of the tripartite state concept, while the qualities of the sage-king, the "sundial", are echoed by the people, who are the "shadow". Philosophers and sages both cultivate their own virtuousness, which makes them just: philosophers' justice is self-grown, while sages attain sagehood by making deliberate efforts to do so. Additionally, both kings are also trusted for their inherent wisdom and virtue. Philosopher-kings are not prone to greed and are lovers of wisdom, while sage-kings are wise and virtuous enough to implement ritual and *yi* in the state.

The similarity between Xunzi and Plato's rulers of their ideal states is remarkable in both characteristics and in function, despite their effects or "raison d'être" diverging. Each ruler's most-valued quality also differs from the other, as sage-kings directly bring about the emergence of the functioning ordered state, while philosopher-kings ensure that the classes all work harmoniously.

Conclusion and Implications

Despite starting off with divergent conceptions of human nature, Plato and Xunzi ultimately ended up conceiving of surprisingly similar concepts of a state, including its structure and its rulers. From this, one may subsequently wonder whether the true nature of humanity matters. Is it important if humans are good, or bad, or rational in the grand scheme of things?

The two philosophers' unanimous agreement in a hierarchy, despite the widespread belief in the equality of humans in contemporary society, also raises questions. Would it be more ethical to have a hierarchy in society, especially now that we possess knowledge of the effects of hierarchies throughout history? Does the efficiency of a hierarchy justify the overriding of people's freedoms?

Despite the questions Plato and Xunzi's conceptions may raise, their remarkable justifications for the state are artefacts in the history of human thought, having provided alternative explanations for the most fundamental part of life: society.

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鳥在宋徽宗與乾隆宮廷繪畫中如何反映皇帝素質與帝國情況

鄭旻真

引言

鳥類是中國古代宮廷繪畫中十分常見的主題。然而在不同時代的宮廷繪畫中，鳥的種類、呈現方式和象徵意義都有顯著或隱微的差異。我的研究問題是：在宋徽宗和乾隆時期宮廷繪畫中出現的鳥類多大程度上反映了兩位皇帝的形象。此論文將通過分析宋徽宗和乾隆時期宮廷繪畫中出現的鳥類，探討兩位皇帝的形象，包括他們在藝術上的身份定位、對藝術的定位和君臣關係；同時分析鳥的形象，包括鳥類來源與象徵性如何反映當時帝國政治局勢。

宋徽宗自行繪畫，將自己塑造成藝術家；乾隆不擅繪畫，因此資助畫家替他繪畫，留下的繪畫也替他營造了藝術的鑑賞者和贊助者地位。徽宗收藏的畫較鬆散寬泛，較多屬於對藝術的欣賞；而乾隆時期的鳥類繪畫也有集結成冊、彙整注釋的特點，以譜集組織呈現，如蔣廷錫的《合摹蔣廷錫鳥譜》，可知乾隆對藝術的定位在其實用性和對知識的追求和掌控上。從兩朝鳥類畫作中，能看出兩位皇帝在君臣關係上的差異：徽宗平易近人，與臣子關係平等而親近，多次將自己畫作獎賞給官員，並常親臨翰林圖畫院指導畫師，亦師亦友；而乾隆帝也設有「如意館」專門替皇室作畫，自己也常親臨畫院給予意見，相當投入。但乾隆與畫師的關係應該更多是主僕關係。

宋徽宗時期宮廷畫中的鳥類種類較少，大多來自東亞本地。這或是有意只選擇本地鳥類入畫，但亦可能與宋朝版圖較小，國勢較弱，少有鄰國朝貢有關。乾隆時期宮廷畫中的鳥類來源則更為廣泛，不限於亞洲鄰國，繪畫中往往註明鳥類的來源，或是鄰國進貢，或是強國外交之禮。顯然乾隆時期版圖遼闊，國勢強盛，外交頻繁，遠近國家進貢甚多。此外，徽宗時期宮廷畫中的鳥類大多具有吉祥的象徵意義，反映出宋朝文弱，強鄰環伺，必須祈求上天保佑、仰賴祥瑞的心態。乾隆時期宮廷畫中的鳥類雖也延續了傳統的象徵性和吉祥意義，但對鳥類的形貌繪畫翔實而注重細節，文字註明清晰而詳細，可看出乾隆時代國勢昌盛穩定，沒有宋朝的不安全感，而更重視對於知識的彙整和保存。

現存的徽宗畫作，並不能肯定是否確實出於徽宗之手。而乾隆時期「如意館」的畫師經常合作創畫，許多畫師的名字並未留下。本文選了三幅宋徽宗或其委託製作的畫，與乾隆委派張為邦與余省合創的《鳥譜》與其他乾隆時期的宮廷鳥類繪畫，專作比較，得出總結。

一、背景

宋徽宗（1082-1135 年）是北宋第八位皇帝，名趙佶，為宋神宗十一子，宋哲宗趙煦之弟，為王子時便對藝術和宗教擁有濃厚興趣(見圖一)。1100 年宋哲宗病逝後，趙佶被向太后立為皇帝。他將精力放在詩、書、畫上，書法號稱「瘦金體」。畫則以花鳥圖著名，而以《芙蓉錦雞圖》為代表。在位時期，北宋正逢內憂外患，內有黨新舊爭，外有金人侵襲，而宋徽宗重用蔡京等奸臣，最終於 1126 年汴京失守，徽宗傳位於長子宋欽宗。同年，徽宗和欽宗父子二人同遭金人擒到北方，史稱「靖康之難」(Ebrey)。其書畫創作集中於擔任皇帝時期，自從被擒擄到北方後，創作或已毀滅失傳。

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圖一：《瑞鶴圖》(宋趙佶《瑞鶴圖》)

乾隆皇帝（1711-1799 年）是滿族人入關後第四位清朝皇帝，名弘曆，為雍正第四子。乾隆自幼受皇子教育，對於學習書、詩、畫與各種語言相當追求（Elliot,57）。1735-1796 年在位，享年 87 歲。

鳥在中國文明中出現得很早，在商朝象形文字與周朝銅鐵上便常常出現鳥的形象。常見入畫鳥類或有吉祥的鶴、鴛鴦、鳳凰、美麗的錦雞、孔雀、鴛鴦，亦有常見的麻雀、燕子、喜鵲等。大多鳥類能被辨認為真實種類，代表畫家觀察細緻。各式各樣的鳥含義皆不同。藝術在宋朝發展到一個高峰，當時認為鳥有三百六十種，各有獨特的鳴叫聲、羽毛顏色、飲食習慣。畫鳥需要大量時間觀察、理解和作畫，因此通過鳥的繪畫，能更好理解畫家或繪畫贊助者的目的觀念及其生活時代風景。

二、皇帝的形象

皇帝是天之子，他們經由上天授權而治理天下。作為皇帝，都希望在青史上留下治國安邦、文武雙全，人民信服的完美仁君形象。從鳥畫能看出兩代皇帝如何試圖塑造自己，以及他們的自我定位。

1. 藝術家與贊助者

文人是儒家的知識份子，是具備一定文學修養的作家、詩人。從兩個皇帝鳥類繪畫能看出兩人對於文人形象的追求與塑造(見圖二)。宋徽宗是一位傑出畫家，他自我定位是一位藝術家。乾隆本人不曾擁有繪畫技能，但資助畫家替他作畫，他自我定位則是藝術鑑賞者和贊助者。

宋徽宗的畫可分為兩種：宮廷繪畫與其他水墨藝術。宮廷繪畫包括《芙蓉錦雞圖》、《瑞鶴圖》、《御鷹圖》、《五色鸚鵡圖》等，展現出徽宗的君權和富貴，或紀錄徽宗在位時祥瑞事件。另一類為淡雅的水墨畫，如《枇杷山鳥圖》、《池塘晚秋圖》、《柳鴉蘆雁圖》等，這些平衡了富貴與淡雅兩方，展示出宋徽宗出色的繪畫才華（李碧紅）。

從《瑞鶴圖》中，能見到宋徽宗對音樂的高度追求。《瑞鶴圖》描繪情景是二十隻丹頂鶴飛翔於宣德門之端，呈現壯觀之感。《莊子•雜篇•天下》：「黃帝有咸池，堯有大章，舜有大韶，禹有大夏，湯有大濩，文王有辟雍之樂，武王、周公作武。」自古以來，明君皆有獨特的樂器，而徽宗也照樣以自己身體尺寸製造出「大晟」。敲奏起，知音的丹頂鶴便會飛來跳舞，帶著濃厚的文人氣質。由此，徽宗的畫反映出他本身藝術家的特質與文人形象（Sturman）。

乾隆帝做為一個治理漢族的滿族皇帝，為了得到人民臣服，更需要努力塑造文人形象。他通詩、藝術、歷史、哲學、書法，一生號稱寫詩四萬三千八百首（Elliot）。乾隆帝對音樂、玩具、繪畫、雕塑都有所探究。「如意館」是圓明園內房舍之一，位於福園門內東側，專為皇帝製作精美的藝術品，如雕作、繪畫等，館中有玉匠、牙匠、畫匠等，乾隆將之設為造辦處作坊之一（嵇若昕）。乾隆廣召畫家居於「如意館」，專門為他繪畫，畫家中西皆有，如義大利畫家郎世寧（Giuseppe Castiglione）、法國法國畫家王致誠（Jean-Denis Attiret）、中國畫家姚文翰、金廷 標、張為邦、余省等。畫家通常專畫同一類事物，又時常合作完成一幅畫，因此很多幅畫都不知其作者，風格不統一 (Elliot)。

在如意館繪畫過程中，乾隆常提供許多建議，對於最終成果有著很強的主觀意見，常讓藝術家多次畫出草稿，在取得乾隆意見和認可後才真正下筆。乾隆本身在繪畫方面成就不大，但是懂得鑒賞評論，而且收集整理大量古典，使他塑造自己成一位藝術鑑賞者和贊助者。

從二君時代鳥類畫作中可以看出，兩位皇帝都熱衷追求文人形象，但宋徽宗的自我定位是藝術家，創作出大量精緻的作品；乾隆則以鑑賞家和贊助家自居，召集多位傑出的中西畫家，指導他們按照他的意思作畫。

各朝譜集數量

	唐前	唐	宋	元	明	清	總共
古董	4	6	23	3	23	61	120
物件		2	14	2	27	49	94
書籍	1		30	8	38	80	157
食物		10	35	1	68	33	147
石頭	1		4		4	14	23
植物	2	5	32	8	60	95	202
花朵	1	2	50		81	122	256
動物	5	3	20	1	23	28	80
鳥類	2	2	8		7	21	40
魚類	2		6		15	19	42
蟲類			2		6	17	25
總共	18	30	224	23	352	539	1186

圖二： 譜錄主題數量和範圍（Akçetin, Faroqhi, *et al.*）

2. 對藝術的定位

收集紀錄文物和知識是一種展示權力的手段。做為天子，宋徽宗和乾隆帝都有收藏大量古代藝術品的習慣。宋徽宗身為亡國之君，其收藏大多散失。他的收藏也是零散的，貼近文人的喜好，主要用於欣賞，較像是為藝術而藝術。乾隆則注重整理匯集藝術品，將自己的收藏做了詳細的描述和紀錄，甚至主導手下畫家製成畫譜集冊。顯然，兩位皇帝對藝術品都有著評價鑑賞的能力，但乾隆留下較多有系統的筆錄以及畫譜集冊，可能因為他認為藝術品不僅只於藝術品本身，更代表著知識的累積和掌握。

宋徽宗時期的鳥類畫作大多是單獨成幅的藝術品，沒有一定的體系或集冊，而乾隆時期則有出名的《鳥譜》，此外還有《鶉鴿譜》、《獸譜》、鄒一桂畫《御製洋菊詩譜》、《職貢圖》等。編輯知識的潮流並非起於乾隆，但清朝譜集遠遠多於其他時代。反觀宋朝也有許多集譜，但數量遠遠少於清朝，並不能全由時代久遠而遭到破壞遺失來解釋。清朝關於動物的譜集多而不同，關於鳥類的譜集共有二十一本，四本包含鳥的所有種類，而其他十七本則以幾種種類為主，如鵪鶉、鴿子等。

現代人並不完全清楚《鳥譜》的創作原因，根據賴毓芝的研究，《鳥譜》與同一時代創作的《獸譜》、《職貢圖》同樣，繪畫帝國擁有之物，展現帝國地大物博，天下太平，國力強盛。當時的人為知識保留和傳播，詳細分類並繪畫出不同的獸類和鳥類，以供皇帝和後人參考，但是只有三分之一的動物可被辨認為真實動物（Akçetin, Faroqhi）。譜集是知識的展示，在某種意義上，能讓皇帝不必離開皇宮也能見到帝國的種種珍禽異獸，獲得「全知」感。乾隆皇帝更可以這些集譜炫耀自己的帝國有多麼龐大，物種有多麼繁多，禽獸有多麼珍奇。

3. 君臣關係

徽宗之前，宋朝初年已設立了「翰林圖畫院」，召集畫師高手在畫院中供職。1104年，宋徽宗因為不滿意當時宮廷畫師的素質，對翰林圖畫院做出改革，畫院號稱「宣和畫院」。為時三年的畫師訓練學校，教導學生畫六個主題：宗教、人像、山水、禽獸、花竹、建築。畫師也須學習古代字典以加強他們在書法上的基礎。徽宗常到書畫院去題詞，要畫家為詞繪畫，並挑選出最好的作品（Ebrey）。徽宗重視佈局、法度、寫實和細膩華貴等，這些特點能清楚地從宋徽宗自己的作品和書畫院學生的畫作中看出。總體來說，由於徽宗非常重視人才，因此他改革翰林圖畫院，將之變成一所畫師學校，親自負起教導的責任，期許畫師們在藝術上有所長進和突破。由畫院的設計可以看出，徽宗和畫師之間的關係更接近藝術家同儕，甚至是師徒關係。

「如意館」的畫師專為乾隆皇帝繪畫，著重功用性，畫師並非皇帝的同儕或學徒，而是下屬。乾隆不時在作畫過程中給予指導，要求畫師畫出完美的草稿，才能真正下筆。乾隆時期的宮廷繪畫經常是為了皇帝需要，如為了增添皇宮的裝飾而指派「如意館」繪製特定的畫作，或收集譜集以展現帝國天威。在繪畫技巧上，「如意館」受西方影響，繪畫中有線性透視與陰影、形變、光線，這許多技巧讓畫顯得更真實（Sturman）。西方畫家將西方繪畫技巧帶到中國，與中國本地高明畫師合作，創造出合併中西文化藝術作品。這反映出乾隆對於西方文化的接受（Elliot）。乾隆時期的宮廷繪畫偏重實用性，著重滿足皇帝本身藝術要求。

對比宋徽宗和乾隆帝兩個畫院，一是藝術學校，一是藝術部門；兩個皇帝一為老師，一為雇主。乾隆高高在上，與官員關係較為疏遠，而徽宗則較平易近人。

除此之外，徽宗常常將自己的繪畫贈送給親近的官員，如蔡京、王黼、童貫等，或是拿出來給官員欣賞（Ebrey）。乾隆帝則通過繪畫，展現出自己是個權傾天下、高人一等的皇帝，由此保持自己崇高的地位和帝國的穩定。

三. 鳥的形象

鳥類繁多而獨特，牠們鳴叫、飛翔、成熟、結伴、繁殖、衰老等過程都截然不同，有一些更隨著經年累月的傳統在中國文化中出現相應的象徵性。此段將以宋徽宗和乾隆時期出現在畫作中的鳥的種類，來分析兩個帝國的版圖和國力，並藉由鳥類的象徵意義，反映帝國當時的狀況。

1. 鳥的種類與中外關係

從二人繪畫中鳥的種類和來源，能窺探宋和清帝國時期的版圖他們和國際地位。宋徽宗的鳥類畫作中並未註明鳥的來源，但是大多數的鳥能夠從其外形分辨種類，並能查出該種鳥類今日的棲息範圍，雖不能確定宋代時該鳥類是否有著同樣的棲息範圍，但是可以大致看出鳥類大多來自東亞。這或許是選材繪畫鳥類的思路不同，現也無法得知，但或可反映宋朝視野的局限。唐代的中國是亞洲最大的國家，周邊國家紛紛向之僅供，尊奉為上國，藉以換得和平，甚至保護。相比之下，宋朝重文輕武，戰場上往往不敵遼國、金國、蒙古，導致宋朝國勢不強，周邊的南詔、大越、西夏、吐蕃、高麗等國均與之平起平坐（Rossabi）。北宋更與契丹人建立的遼國簽訂《澶淵之盟》，以年年向契丹進貢換取和平，雙方互相承認為皇帝（Fairbank and Goldman）。或許因此，在宋徽宗時期，周圍的國家少向宋朝皇帝進貢，因此宋朝皇帝並沒有機會見到遠地的珍禽異獸，只能就地取材，以本地的鳥類為繪畫的主題。

乾隆時期的宮廷畫中鳥種類更多元，而且畫旁有詳細註解，闡釋鳥類來源。《乾隆觀孔雀開屏》的孔雀是「西域職貢昭咸賓，畜籠常見非奇珍」。根據國立故宮博物館院記載，自康熙年間始，哈密以孔雀歲貢，因此大致能推測這隻孔雀來自哈密（賴毓芝）。作者為郎世寧、金廷標，完善地混合中西繪畫技巧之優秀之處，展現出一隻翔實而逼真的孔雀。

乾隆的額摩鳥也並非本地出產，而是出自「嘎拉巴」與「佛朗機亞」。從繪畫與詳細的描述能猜測額摩鳥就是食火雞，或稱鶴鴕(見圖三)。鶴鴕的棲息地大多集中在澳大利亞與其他南亞、大洋洲國家(IUCN International; Southern Cassowary: *Casuarius casuarius*）。

圖三：《合摹蔣廷錫鳥譜·第一冊・額摩鳥》（北京故宮博物院藏）

圖四：《合摹蔣廷錫鳥譜・洋雞》（王釗）

圖五：《合摹蔣廷錫鳥譜・雌洋雞》（王釗）

《欽定鳥譜》很有可能直接延襲了蔣廷錫《鳥譜》的順序，因此將雌雄洋雞繪畫在一起，但是在修改繪製《鳥譜》時因不滿繪畫而將之拆散（王釗）(見圖四及圖五)。洋雞從外表來看應該是火雞，而火雞來自北美（IUCN International; Wild Turkey: Meleagris gallopavo）。由此可見乾隆與歐洲國家有不少聯繫和交易。

《欽定鳥譜》內也能見到洋綠鸚鵡、洋綠鸚哥、灰色洋鴿、洋鴨、雌洋鴨、西綠鸚哥等，進一步證明了清朝當時與外國—尤其西方國家—的聯繫和貿易。

《鳥譜》幾乎所有其他鳥類有著富貴、華美的特性，因為一書用意就是為了展現朝廷擁有一切知識的權力。孔雀是一個完美的例子：牠被西貢介紹入清朝，多次在《鳥譜》與乾隆時期的其他宮廷繪畫中出現。

綜觀以上，宋徽宗時期宮廷畫作中的鳥類種類較少，大多是出自本地，有些珍稀罕見，有些則是平日常見的鳥類，或可反映出宋朝國勢較弱，版圖較小，進貢有限，閉關自守；而乾隆帝時期清朝版圖遼闊，國勢強盛，鄰近國家定期進貢，清朝與遠方國家也有聯繫交易，因此乾隆朝的宮廷畫中鳥的種類繁多，有的甚至來自遙遠的美洲、歐洲，反映出清帝國強盛的情況。

2. 鳥的象徵性

中國人喜愛使用象徵性的圖案以帶來吉祥，如古代以四靈祛邪、避災、祈福的作用，或以蝙蝠代表「福」，以「魚」代表年年有餘等。

鳥在中國文化中有著重要的地位，在宮廷畫中出現的鳥類主要可分為吉祥的鳥、稀有的鳥和美麗的鳥。牠們各象徵著皇帝所祈求的吉祥，權利和富貴，以及朝廷的豐盛華美。

《合摹蔣廷錫鳥譜》繪畫出三百六十隻鳥類的譜集，包含各地來的鳥類，但可以由鳥譜的順序看出乾隆對於鳥類重要性的思維。列於卷首的都屬象徵吉祥的鳥類。相對徽宗繪畫，《鳥譜》包括了鳳、鸞虛幻的鳥類(見圖六及圖七)。《鳥譜》的畫旁大多註寫著鳥的外表、鳴叫聲、習慣等清晰的解釋，鳳與鸞也不例外，有著相當詳細的外表描寫，但是對於鳳與鸞的描寫中較多引用古典描述。古代鳳和鸞是否真實存在？考古學家至今並未找到鳳和鸞的化石或遺跡，大約只是當時人相信鳳和鸞存在。

圖六：《合摹蔣廷錫鳥譜·第一冊・鳳》

圖七：《合摹蔣廷錫鳥譜·第一冊・鸞》（北京故宮博物院藏）

吉祥鳥類的含義從宋朝到清朝沒有太大改變。鶴在《瑞鶴圖》出現，乾隆《鳥譜》亦繪畫了鶴、灰鶴、小灰鶴(見圖八及圖九)。牠們在中國文化始終被認為是祥瑞，代表長壽、高潔、志向，由鶴的長壽或許也祈禱皇帝長壽。但從《瑞鶴圖》或許亦能窺見宋徽宗對未來的恐懼。他或是已意識到鄰國對宋朝的威脅，感到皇位的不穩定和權力的空虛，因此對代表美好未來的祥極為在意。

圖八：《瑞鶴圖》（宋趙佶《瑞鶴圖》）

圖九：《合摹蔣廷錫鳥譜·第一冊・鶴》（北京故宮博物院藏）

宋徽宗和乾隆時期對猛禽的描畫也有較強的延續性。宋徽宗所繪畫的《御鷹圖》展現一隻尊嚴、蒼白的御鷹，抬頭挺胸，性格兇猛、顏色蒼白，甚為獨特(見圖十)。威猛罕見的白鷹代表戰爭的勝利，帶著吉祥、神秘、威風的寓意，或能展現宋徽宗對自己掌握無上權力的期許。

同樣郎世寧也為乾隆繪畫了白鶻圖(見圖十一)。「是皆其色褋蒼黝，如雪白者萬無一」描寫其稀有性，「爾行其義我行仁」一句讚美皇帝的道德。這張繪畫有著傳統中國的背景結構，白鶻站在松樹之上，後邊有著山與瀑布。同樣是稀奇的白色獵鳥，此鳥姿勢更自然，繪畫出一隻鳥的警覺感。

圖十：《御鷹圖》（宋徽宗趙佶作品）

圖十一：《白鶻圖》（國立故宮博物館院）

《芙蓉錦雞圖》包含錦雞、芙蓉、蝴蝶，右邊寫著宋徽宗所題五絕，一詩意思大約如下：秋天的氣抵抗了冰霜，戴著高帽的錦雞，已經含有了五德，而安逸更勝於野鳥和鷗(見圖十二)。詩中所提「五德」為文、武、勇、仁、信。錦雞又代表吉祥、好運，而且十分美麗，帶有貴氣。宋徽宗在此畫中畫出宮廷的富貴感，而以此代表自己所希望擁有的五德。這幅畫中的錦雞、芙蓉、蝴蝶全都蘊含著吉祥的意味，可見他希望自己得到上天的眷顧，賜予好運，順利地領導大宋。

郎世寧所繪《錦春圖》中錦雞真實、成雙，棲息在石頭上，海棠花在後。畫面較複雜，雄錦雞顏色鮮豔，雌錦雞顏色樸素，二隻塑造出優美的情境。美麗與富貴的鳥類表達出清朝宮廷盛況，炫耀清朝國力(見圖十三)。

圖十二：《芙蓉錦雞圖》（宋徽宗趙佶作品）

圖十三：《錦春圖》（國立故宮博物館院）

滿族傳說中，滿族祖先曾被灰喜鵲所救過，因此在清朝，喜鵲得到十分崇高的地位（莫力達瓦）。《喜鵲》、《白喜鵲》、《黑喜鵲》、《山喜鵲》在《鳥譜》中出現，是較少在宋朝繪畫中出現的鳥類。

綜而觀之，兩位皇帝的鳥類繪畫中，鳥類大都帶著強烈的象徵性。吉祥鳥類並未隨著時代變遷而出現太大的改變，如鶴在宋朝和清朝同樣受到重視，但喜鵲在清朝得到特別重視。儘管相隔幾個世紀，由於兩位皇帝都秉承著中華文化的傳統，因此在創造吉祥寓意時所選擇繪畫的鳥類亦相似。富貴或稀有鳥類則有了改變，因為兩個時代的稀有鳥

種已有了極大的改變。徽宗時代象徵富貴的鳥類是在東亞出現的罕見或美麗鳥種，乾隆的鳥則來自各方，反映了清朝強大的國力和廣闊的國際關係。徽宗時期的華美的鳥類包括許多出現在東亞的鳥類，大多數不但含有吉祥意義，同時也有著華美的外表。而乾隆時期的華美鳥類則以外來的鳥類為主，甚至包含了遠方珍禽如孔雀和額摩鳥等。這一點上，很明顯的從宋朝至清朝有了劇烈的改變。

結論

通過分析宋徽宗和乾隆皇帝宮廷繪畫，我們得出許多結論。由於二位皇帝皆以宮廷繪畫塑造形象，我們能較清晰看出二人所希望表現的自我。從宋徽宗身為藝術創作者與乾隆帝身為鑑賞贊助者之分別，能看出二人對於「文人」形象的積極追求。從徽宗重視藝術地位，存粹為藝術而創作的信念，相對乾隆對於知識掌控的需求，能看出二人在理性與感性上的不同，又能見到徽宗希求成為絕對的藝術家與乾隆追求成為絕對知識的掌控人之分別。從徽宗翰林書畫院與乾隆如意館的分別，以及兩位皇帝對待藝術家的態度，能看出徽宗依然遵循儒家的君臣關係，以師友的身分相待；而乾隆則將官員當成下屬。

藉由宮廷畫中鳥的形象，又能見到帝國版圖和國力，以及當時的政治局勢。從鳥類來源可看到帝國對外關係，宋徽宗時宮廷畫中的鳥類種類狹窄，限於本地鳥類，可推測宋朝疆土較小，國力較弱，與外國珍稀禽鳥交流亦少；相對乾隆時期，宮廷畫中的鳥類來源廣闊，許多來自各方國家進貢、送禮，可見清朝疆土廣大，國力強盛，外國進貢頻繁。而宮廷繪畫中的鳥在各時代也有著文化上的意義，各種鳥類大多富有吉祥的象徵性。相比起來，我們看到宋徽宗對於祥瑞的執著，也許反映宋朝政治不穩定，強敵環伺；乾隆則擁有強大的國勢，政治局勢平穩，因此更加重視知識的彙整和保存。有趣的是，在兩個不同的時代，鳥類的吉祥寓意大都依舊，富貴或稀有鳥類卻改變了：從宋朝的錦雞和御鷹，轉變成了清朝的火雞和孔雀。

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How Did the Construction and Deconstruction Process of the Woosung Railway Reflect China's Development into the Modern Era?

Ka Kuen Nicolas Ho

Today's China is well known for its fast-paced progression. Over many centuries it certainly has gained many notable achievements, whether it was a successful revolution overthrowing an emperor or inventing new technologies that will affect the future. By the late Qing Dynasty, China had begun to adopt modern Western technologies and institutions, introducing a new industrialized era to the East. Trains were a massive influence from the West, being one of the first technologies introduced to China.

We are often told that Chinese people were heavily influenced by their superstitious beliefs in *fengshui.* The introduction of Western science and technology to Chinese territory was not initially accepted, as it was feared that the mines, railroads and telegraph lines would upset the *fengshui* and disturb the imperial ancestors. (Fairbanks and Goldman 219). Trains were viewed as demons spewing smoke and burning coal ("Chinese Railways") The straight lines of the metal tracks were thought to be damaging to the *qi.* In order to mitigate this, unnecessary curves were made to the route. However, this research also found out from historical sources that the first train actually piqued the interest and curiosity of the locals, who lined up to watch it run. This brings us to the question: was it really China's cultural background that caused its suspicion of Western technologies? To answer this question, I will be exploring the rise and fall of the first ever railway built in China; the Woosung Railway.

The history of railways in China started in 1876, when the Woosung Railway was built by the British. A few years later in 1881, the Qing Dynasty independently built the Tangshan-Xugezhuang railway line, famed for being the first railway built by a Chinese engineer. As time passed by, the Qing Dynasty proceeded to construct more and more railways, including the famous Beijing-Hankou Railway. As modernization continued in China, and their technology continued to advance, they had already built approximately 287.3 km of railway lines by the year 1894 (Xue *et al*., 155). In that very year, the Sino-Japanese war broke out, ushering in a new era of colonial struggle for China. By the early 1900s, after the Qing Dynasty's fall and the rise of modern China, 9400 km of railway lines had been constructed, where 41% was controlled by foreign powers, 39% controlled indirectly by foreign powers and 20% controlled by China (Xue *et al.,* 155).

The Woosung Railway is a 9 ¼ mile (14 km) railway that has a 30-inch gauge ("China Railway History"). It connected Wusong and Shanghai, which is from the present day Baoshan District to present day Zhabei District. This was known however as one of the most short-lived railways in history, since the time between its construction and deconstruction was only 2 years, from 1875 to 1877.

The story of the Woosung Railway began when a group of Shanghai foreign traders founded the company on 13th of November, 1872. It started off an initial capital of 50,000 taels, the old currency of China. The members of this company included Messrs C. Alabaster, O.B. Bradford, C.P. Blenthen, A.A. Hayers Jr, E. Iverson, J.J. Miller, J. Haas and C.E. Hill. They were all longtime residents in Shanghai, and they requested permission to construct a "roadway" between Shanghai and Woosung. The reason they mentioned a "roadway" instead of a proper "railway" was because they did not want to let the Chinese official, the *taotai* named Ying Baoshi 應寶時 know about Britain's true intentions. They feared that the Chinese would be in a state of denial after hearing that a railway would be constructed, so the term "roadway" was used instead (Crush & Reid 9). Upon

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receiving the permission of the *Taotai*, O.B. Bradford, the United States' Vice Consul, purchased the land required for the 'roadway'. Before proceeding, however, the Woosung company was still waiting for official documents for the confirmation of the project to begin (Crush & Reid 10).

Not long after, an engineer named Richard Rapier enters the picture. At the time, he was unaware of the Woosung Railway project, but he independently designed a locomotive which could be shipped to China. Rapier started the design and construction of his locomotive, but since he was under no pressure to finish it, he took his time and completed the locomotive in 1874. The engine he designed and constructed came in the form of a 0-4-0 saddle-tank engine weighing about 1117.65 kg. Rapier decided to call this locomotive "The Pioneer", because it was China's first railway engine (Crush & Reid 12-14). By early 1875, a contract was finally signed between the Chinese and the British, officially allowing the construction of the Woosung Road in China. Note that the Chinese still had no idea that the British were going to construct a railway. A set of rails weighing 26 pounds, sleepers, the construction engine Pioneer, two heavier passenger service engines, one first-class, one second class and four third-class carriages, as well as other necessary equipment, needed to be constructed to operate the railway.

In the same year, Richard Rapier was contacted by Jardine Matheson & Co. in London. He was advised by L.B. Johnson, Jardine's British Shanghai Chief, to meet with him to discuss the Woosung Road. Rapier invited them to see "The Pioneer" in action during a trial run on 27th May 1875. When the director went to see the engine in action, he was very impressed and asked Rapier to help further the project on the Woosung Road. Later, in August 1875, Gabriel James Morrison was appointed as the Woosung Road's engineer in charge. He was a man with much past experience, having worked as an engineer for railways in the West. On the 8th January 1876, Morrison finally arrived in Shanghai via a ship from San Francisco and got straight into construction of the railway. Just five days later, on February 14th, three quarters of a mile of the track had already been laid down. This was when the directors decided to let Rapier's designed "Pioneer" go for a trial run (Pong 649).

The locals had never seen such a thing before and described the train engine as a "firecart". After the successful trial run of the Pioneer, the railway was operated regularly to enable the railway workers to get to different locations on the track. However, news spread of the Pioneer engine and the railway, reaching the Chinese Authorities. Originally thinking that the British were simply going to construct a road, the Chinese felt betrayed. Another *Taotai* named Feng Junguang had already complained to the Woosung Road Company about the unauthorized laying of the rails, and, knowing about the Pioneer exploits, grew even more furious (Pong 663).

On the 24th of March, 1876, Shanghai's English newspaper, *The North China Herald,* released an editorial condemning the Woosung Railway. This again gained the locals' curiosity. Morrison decided to encourage locals to ride the train, and included matting and seats for high status visitors. In doing so, he wanted to gain the support from the locals and gather positive feedback, so that the Chinese Authorities would hopefully change their minds about the railway. On 27th May, at 5:00pm, the Woosung Road Company organized their first official excursion. Since the actual engines and carriages had not arrived yet, the Pioneer was used for the excursion and the invited guests sat in open wagons for a four-and-a-half-mile return trip to Jiangwan. The excursion passed without incidents or problems, leading the company directors and the invited guests to be very satisfied with the experience. (Pong, 666).

However, on August 3rd, the 9 a.m. train that was coming back from Shanghai accidentally ran over a man. The driver of the train, David Banks, was charged with manslaughter. However he was later tried in a Western tribunal and acquitted, based on the information that the train was already stopped and the victim was likely suicidal (Pong 652). This did not leave a lasting effect on the Chinese; but it did cause the British to suspect that the victim had been hired by the Chinese authorities to incite the hatred of the local population. This began to create conflict between the Chinese and the British.

Later in the year on 24th October, an agreement was made. The property of the Woosung Railway was given to the Chinese government by absolute purchase, and the land taken up by the construction passed into the possession of the Chinese government. The Chinese had full possession over the line in October 1877, when the Viceroy Shen Baozhen 沈葆楨 decided to disassemble the railway. At the same time, he also blocked other Western attempts to build roads on railways in Shanghai. Shen originally planned to ship

the obsolete rails and rolling stocks to Qing Taiwan, to help in the development of coal mines. However, the shipment failed due to lack of funds and the mishandling of the shipment. Instead, the rails were dumped along a shore (Pong 656), left as waste to rust over time (Crush & Reid 99-100).

After viewing a detailed yet summarized history of the Woosung Road, it is important to understand why the Chinese at first agreed to the construction of the road but then hastily decided to deconstruct it. Looking at the industrialization of late Qing China, it seems that after the events of the Opium War and the Taiping Rebellion, the Chinese had begun adopting Western arms and technology as a means of self-strengthening.

Therefore, when a group of determined Shanghai foreign traders applied for permission to build a "road", Chinese officials granted it, thinking it would be for the benefit of the people. The Chinese's acceptance of the request for the Woosung Road project shows how China was slowly accepting Western technology into their land.

However, after gaining official permission for the construction of the road, the Woosung Company moved into a deceptive scheme, since at no stage of the communications between the merchants and the Chinese officials was the true intentio of building a railway declared. Before even realizing the true intention of the Woosung Road, the regional Viceroy Shen noticed that the public land in Woosung had been illegally sold for the construction of the "road". During the construction, Viceroy Shen soon realized that the piece of land was actually being used to build a railway. This eventually led to a series of complicated negotiations between British traders and Chinese officials, including the constant request from the Chinese to purchase the company and the railway in order to gain full control over the project. As Li Hongzhang 李鴻章, a powerful Chinese politician, once said, 'if any railways existed on Chinese Territory, it must be Chinese and not under foreign undertaking' (Pong 674).

Therefore, the true reason why the Chinese refused the continuation of the Woosung Railway was because they wanted to maintain sovereign power over the use of foreign technology (Pong 653). This political explanation makes more sense than the superstitious beliefs concerning the railway's effect on *fengshui*. This is clearly shown from the quote from Li Hongzhang, who opposed the construction of railways by foreigners, stating that the opposition to the introduction of railways in China lay in his "aversion to the spread of foreign influence". When he clarified his opposition to the railways to W.F. Mayers, the British secretary, he insisted that "if ever a railway exists on Chinese territory, it must be Chinese and not a foreign undertaking" (Pong 674). After the deconstruction of the railway, Shen Baozhen was determined to get rid of the railway and move it to Taiwan, which proved that the Chinese were not culturally opposed to the railway, rather, they just wanted it not to be under foreign control. All of the rights of the railway were thus passed into the possession of the Chinese Government (Pong 60-61).

Additionally, some socio-economic factors also explain why the railway was deconstructed. When the Woosung Railway was introduced, the main method of transportation in the region was boats. Since trains were much faster – the new modified engines reached speeds of 20 mph (Crush & Reid 10-12) they replaced boats as the main form of transportation, threatening the jobs of boat drivers.

As shown from the construction process, China was willing to allow foreign engineers to construct roads, as officials saw this as a method of improving transportation for locals. However, the deceitful way in which the foreign traders proceeded with the railway raised concerns and suspicions, ultimately leading to the deconstruction of the railway. This impacted the relationship between the Chinese and the West, causing trust issues to impact China's path into modernization, allowing China's sovereign ideology to remain, and perhaps slowing down the country's modernization as a result.

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What do the Contrasting Beliefs of Plato and Xunzi Regarding the Correctness of Names Reveal About their Ideologies?

Hock Man Rachel Choy

Introduction

This paper will seek to demonstrate that Plato (428/427 - 424/423 BCE) and Xunzi's 荀子 (310 - 235 BCE) ideas regarding the importance of correct names will reveal their contrasting philosophical attitudes. Despite holding many similar notions behind the methods of correcting names, the two philosophers' ideas demonstrate a strong contrast when they justify their reasoning behind the methods used in correcting names. With Xunzi, he adopts a conventionalist approach towards trying to correct names, while Plato prefers naturalism over conventionalism. These contrasting preferences are deeply rooted within the value system of each philosopher and serve as reflections of their perspective as a whole.

This paper will be mostly making use of Plato's *Cratylus* and Xunzi's *Zhengming* 正名 [*Correctness of names*] to examine the argument at hand. *Zhengming* is an essay in *Xunzi*, a book collecting many of Xunzi's philosophical writings. *Cratylus* is a theoretical dialogue by Plato between three men: Hermogenes, Cratylus and Socrates. In both texts, the two philosophers examine the existing problems with current languages, provide methods to correct these flaws, and determine the best methods to make sure that the names are correct.

The term "correctness" will be used throughout the paper, where the word refers to the quality of something that is in agreement with widely accepted knowledge. The definition of what a name is will follow the work of the philosophers. Plato delves into the names of nouns, adjectives, and verbs, while Xunzi discusses names from those of objects all the way to "names that are given to newborns" (Xunzi 9).

1. The Inherent Issue of Names

In order to gain a greater understanding of why names must be corrected in the first place, it is important to understand why both philosophers see current names in their contemporary society as flawed and therefore in need of change. Interestingly, Xunzi and Plato both seemed to share many coinciding ideas in this field, as both philosophers saw current language systems in general as flawed. This was in contrast to how they viewed more ancient languages, with both philosophers believing that language had essentially degraded and become less accurate over time.

Xunzi refers to the "golden period" as the time when language provided perfect clarity (Goldin). At this time the sage kings ruled the land and oversaw the correct use of language. However, after the sage kings died out, the quality of names became increasingly worse, resulting in chaos within the world and "depraved teachings" being spread (Xunzi 167 - 168). While some old names have been preserved from the ancient language, most of this ancient language has been lost (Xunzi 53 - 55).

Similarly, Socrates explains that the ancient language was perfect, and ancient peoples always "expressed clearly what they mean" (Plato 418b5). The people in charge of overseeing name - making were called the "namemakers". However, once these namemakers were gone, people began to create new names carelessly, changing previously perfect names without any consideration until, eventually, names became "so dressed up that no one can understand what they mean" (Plato 418d4 - 5).

Overall, it is clear that Plato and Xunzi share remarkably similar views as to why there was an issue with language and names in their society. Both hypothesise a period of time when all names were 'correct' and language was perfect, hinting at the fact

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that, if suitable conditions were put in place, names could perhaps be 'correct' again at some point.

2. The Original Makers of the Names

According to Plato, the role of a namemaker could only be taken up by a small number of people, capable enough to recognise and create correct names. During the dialogue, Socrates describes them to Hermogenes as follows:

> It follows that it isn't every man who can give names, Hermogenes, but only a namermaker, and he, it seems, is a rule-setter - the kind of craftsman most rarely found among human beings
>
> (Plato *et al.* 388e6 - 389a2)

This quote emphasizes the rarity and significance of a namemaker. Further to this, Socrates describes how they recognise sounds and syllables as the equipment and tools they will need to craft a name, also recognising what sounds and syllables would be suited for any task at hand (Plato 389d3 - 4). Plato compares a namemaker's job to that of a blacksmith, with sounds and syllables compared to the iron a blacksmith uses. Just as with unprocessed iron, sounds and syllables are not worth much without proper craftsmanship (Plato 389d2 - 390a1).

Similar to the namemakers, sage kings were highly intelligent and accomplished in the craft of creating correct names. However, in addition, sage kings were required to be comparably more dignified and virtuous than namemakers, as they were also the ideal rulers of a country. Sage kings were previously established figures in Xunzi's writings, and he believed that it was only natural that they should be given the important role of making names. Their strict abiding to rituals and virtues demonstrated their legitimacy and their capabilities of creating names (Goldin). Sage kings also possessed no desires and were entirely selfless (Xunzi 21), allowing them to be completely objective and accurate when creating names.

It was through name-marking that the kings were able to instill order and understanding within society. (Xunzi 30-31). Furthermore, sage kings were able to carefully identify the evolution of the experience that the name will give to an individual. When naming, they consider the evolution of experience someone would receive if they used, read or heard the word, the natural origins and the psychological and sensory stimulus or passion. The sage king is also knowledgeable and clear-headed; he is able to accurately inspect the validity of the process as the naming process is occurring (Goldin). Their carefully chosen names demonstrate vast accumulated knowledge from never-ending new encounters, exchanges, and experiences. Xunzi said that through the efforts of the previous sage kings, they have still been able to retain some of the original and correct names (Xunzi 45 - 47).

Despite their valuable characteristics, the number of sage kings and namemakers began to dwindle, though neither philosophers adequately explain why this was. Nevertheless, the absence of these individuals at least explains why both thinkers had to introduce a set of criteria by which to ensure a name was correct.

3. Definitions of What Makes a Name "Correct"

Both Plato and Xunzi refer to names as tools to distinguish one object from another when communicating. Xunzi states that good names should have a clear designation between the name itself and reality, to prevent any misconception or confusion (Goldin). Plato similarly thought that accurate names allowed the user to separate with more clarity between individual objects, stating that a good name is able to describe the object in mind, as well as being able to capture the essence of the object (Plato 383a4 - 5). Therefore the ideal names, for both Plato and Xunzi, should, at the very least, allow someone to avoid any confusion when applying these names to material objects.

4. Methods of Making "Correct" Names

In the *Cratylus*, Plato introduces two solutions to solve the problem behind why names are currently so disorganised and chaotic. The first solution can be described as the conventionalist method of naming, which is endorsed in the dialogue by the philosopher Hermogenes. In short, Hermogenes believes that as long as the name you give to something can be correctly understood, "any name you give is its correct name" (384d1 - 2). Therefore, as long as users of the language obey set conventions, he believes that an object can have multiple names, while a name can also be applied towards multiple objects (Sedley). To Hermogenes, therefore, understanding was more important than accuracy.

Similarly, while Xunzi did not specifically mention the concept of conventionalism, he also offered a very similar method of creating and correcting names in *Zhengming*. As Xunzi was a Confucian philosopher, many of his ideas about names align with the

Confucian ideology, specifically with the importance of upholding rituals. Xunzi believed that specific, carefully determined criteria can help create accurate names or reform inaccurate names. These names also must be agreed upon by the masses and must be straightforward to avoid any potential misunderstanding or confusion. According to Xunzi, providing the agreed names are diligently preserved, this will allow for "the height of good order" (Xunzi 45 - 47). Overall, the ultimate purpose and goal for name-making can be summarised in the following statement :

> If a name can easily identify the object it is named after and be a part of appropriate naming conventions, it achieves both usefulness and function.
>
> (Xunzi 177 - 180)

In contrast to this conventionalist method of naming, Plato offers an alternative through the voice of Cratylus, which can be described as the naturalistic method. According to Cratylus, common convention alone is not enough. Instead, a name needs to be "naturally suited" to the object in mind. (Plato *et al.* 389d2 - 3). Another difference is that, while in the conventionalist method one object could be referred to by several names, in Cratylus' naturalistic method of naming, the importance of each object having one true name is consistently stressed. This belief stems from Plato's Theory of Forms, which holds that everything has one true name that is destined for the object in mind (Sedley). Cratylus also proposes that in the absence of the ancient namemakers, a dialectician, skilled in philosophical discussions, should be in charge of checking each name to ensure its accuracy (Plato *et al.* 390d4 - 5).

From his explanations in the *Cratylus*, it seems clear that Plato personally favors the naturalistic method. The dialogue in the *Cratylus* focuses heavily on the words of Cratylus and goes into detail regarding how superior naturalism is compared to the flawed conventionalistic method. As from the previous explanation regarding how names became increasingly flawed as people began to carelessly change or create new names, Plato saw that it was conventionalist people like Hermogenes who are too inattentive and similar to the people that began to change names carelessly following the extinction of the namemakers (Goldin).

Xunzi also acknowledged the naturalistic method as the ideal method of naming. However, he believed that only the sage kings would be able to effectively channel the naturalistic methods when changing or creating names, because they have superior sensory abilities and strength that allow them to consider all aspects regarding the evolution of experience someone receives when using the name (Goldin). Mere mortals simply lack the understanding and knowledge to allot natural names, and thus this method of naming is no longer possible. He adds that, if sage kings ever returned, they would be able to restore the order of names through the naturalistic method with their superior abilities :

> If there arose a true king, he would surely follow the old names in some cases and create new names in other cases.
>
> (Xunzi 53 - 55)

Ultimately, excluding this possibility, Xunzi dismisses naturalism as a plausible or realistic solution (Goldin). Instead, from the way Xunzi explains what makes a name correct, he demonstrates that conventionalist methods will still allow names to be corrected to a satisfactory quality.

5. Evaluation of Methods

From understanding how the two philosophers approach a naturalistic and conventionalist method of naming, it is clear to see that both possess distinct ideologies. Plato believes naturalism to be the sole solution to fixing flawed language systems, saying that the best names are the most natural. Only a natural name can best indicate the nature of the object and achieve its purpose as a name (Fine). Linking back to Plato's reasoning behind why conventionalism is flawed, Plato determined that everything has a single name that is destined for it, and every name is destined for a single thing. From understanding Plato's Theory of Forms, it is clear to see why Plato possesses this kind of mindset and determination in upholding naturalism.

On the other hand, Xunzi offers an alternative perspective, saying that :

> Names have no predetermined appropriateness known to man.
>
> (Xunzi 120)

Although he similarly references both the conventionalistic and naturalistic method, Xunzi ultimately makes the decision that conventionalistic methods should be employed in remedying language,

mainly because it was too idealistic to hope for a naturalistic solution. This mindset can also be observed in Xunzi's wider perspective as a thinker. As a Confucian philosopher, he recognises the importance of rituals, as part of the Confucian virtue of *Li*. This belief therefore perhaps aligns with Xunzi's method of correcting names through conventionalism, where names will be assigned based on prescribed and commonly agreed order.

Conclusion

In conclusion, the two philosophers demonstrated major differences when explaining their preferred method for correcting names. Although Plato acknowledges the conventionalist method, he ultimately prefers a naturalistic method. Although Plato recognises that the conditions required for the naturalistic method would be impossible to meet and requires standards that are unlikely to be fulfilled, he views that a conventionalist method would only further contribute towards the chaos with current day names. Only a naturalistic method could succeed in capturing the one intended name for the subject in mind. From understanding Plato's Theory of Forms, it is clear to see why Plato has a firm belief that only one name would be able to capture its object perfectly and therefore continuously sides with the naturalistic method.

On the contrary, Xunzi had a more realistic and practical perspective and also saw the strength in making use of conventions. This can be attributed to Xunzi's definition of a correct name, as he simply did not believe that everything inherently has only one correct name. Since the sage kings no longer exist, Xunzi recognises the strength and benefits of making use of conventions. While some may view that Xunzi is rather lenient with his preferred method of naming, the conventionalist method also aligns with many of his Confucian virtues, which makes his preference for it understandable.

Ultimately, Plato and Xunzi shared many similar notions regarding the inherent issues with current names, the original individuals that were able to make perfect names, as well as sharing similar ideas regarding methods of name-making. They had both believed that names were once perfect and orderly when the namemakers and sage kings created the names. However, following their extinction, there was no one to control and uphold these names, and people began to carelessly create or edit names. As a response, Plato and Xunzi offered methods for correcting names, shedding light on the problems with languages that are still relevant in the present day.

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Was China's Launch of DFH Satellite Political or Scientific?

Sky Chak

Introduction

China has a long-standing history of space-related ventures. China may be the first country to record the use rockets for warfare (Von Braun 22), they were the fifth to reach space. This paper will be focusing on China's space program, answering the question: "Was China's Launch of DFH Satellite Political or Scientific?" In May 1958 Mao Zedong officially adopted project 581, which supported plans to launch a satellite into orbit by 1969. This was undeniably a political reaction to the Space Race between the Soviets and the Americans. Facing potential international fame and glory, Mao told his colleagues, "We too must launch a man-made satellite." When analyzing the motives of China, we can see that The Fifth Academy and the Space Program were developed as a military and political initiative. This is a clear response to the American and the Soviet's nuclear weapon prowess and the arms race that heightened during the Cold War. This is not to say that science does not play a role in the launch of this satellite either. The mere task of putting a satellite into space is a feat of technology and innovation. Because China was so lacking in computational technology and aerospace engineering, the development of this satellite pushed the technology of the entire nation forward, bringing technologies like television broadcasts and telecommunications to the table. This paper will be exploring the historical context and significant individuals that lead to the launch of Dong Fang Hong -1 as well as its impact on Chinese society and the relationship between science and politics.

1. National & International Context

The birth of the Chinese space program occurred during the Great Leap Forward and the Cultural Revolution. During this time, the Cold War between the United States of America and the USSR was reaching a peak. One of the most important aspects of the Cold War was the nuclear arms race and the space race. The arms race is the competition between America and Russia to develop nuclear bombs. After America surpassed Russia to the atomic bomb by dropping one on Hiroshima and another on Nagasaki, Russia raced to develop their own. This led to the next evolution of nuclear technology, thermonuclear bombs, more commonly known as hydrogen bombs. The space race is closely tied with the arms race as missile technology is fundamentally same technology as rockets that send men into space. The space race is a race of three stages. The first stage was won by the Soviets with the launch of Sputnik 1, the first man made satellite in space. Then the USSR followed up with sending Yuri Gagarin, the first man to space. Lastly, the USA caught up with the USSR with the famous Apollo 11 launch, with Neil Armstrong and Buzz Aldrin being the first men to walk on the Moon (History.com Editors).

This is all significant as it is directly related to the birth of China's space program. After the Communist party defeated the nationalists in 1949, China was desperate to prove that it was a force to be reckoned with in the international eye. After declaring itself as a communist nation, China had a close ally in the USSR, the leader of the communist block directly competing with the United States in the space race and the Cold War. The United States had a strong opposition against communist ideals, naturally leading China to side with the Soviet Union. In 1958, the Great Leap Forward began. Mao Zedong decided to heavily boost China's iron and steel production and export with the motto of "Surpass England, catch up to America". Manpower across China was pulled away from agricultural production to smelt any metal people could gather. Another aspect was the failed crop experimentation with a goal of increasing agricultural yield, following an article written by Qian Xuesen 錢學森, a scientist whose career will be further explored later. The article stated that crop yield could be increased twenty-fold, as long as there was enough water, sunlight, nutrients, and space. The government enthusiastically bought it,

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to the dismay of other scientists. Eventually the population succumbed to a famine spanning three years. Then came the Cultural Revolution (1966-1976), launched by Chairman Mao to purge all bourgeois thinking and return to communism at its purest state. The red guard was formed, abusing intellectuals and destroying things related to intellectual pursuit. While this period was devastating to the scientific development of China, contrary to popular belief, not all of China's technology stumbled. More specifically, military and rocket technology flourished, as scientists found refuge and food by working for the government (Chang 242).

The first Chinese satellite took ten years to finish from start to end. China then lacked factories, qualified manpower, knowledge, computers, and much more. Furthermore, during this time of slow advancements, their "Big Brother" the Soviet Union threw a wrench into their plan with the Sino-Soviet split. Before the Sino-Soviet split in August of 1960, China could rely on the USSR to help with the development of weaponry and rocketry. USSR would provide blueprints, whole rockets, and scientists. When the Sino-Soviet split occurred for complex reasons, USSR pulled out 1400 scientists, and any documents they could not carry were shredded. Over 200 joint projects were cancelled (Harvey 34). Despite the tension between nations, according to record, the farewell between scientists was good natured and with genuine regret from both sides (Harvey 34).

However, against all odds, China still succeeded in putting a satellite in the orbit ten years later. To understand this success, we need to explore the story of the Fifth Academy, its leading scientist Qian Xuesen, and the purpose of the satellite itself. To illustrate the Chinese space program's intent, its goals and process will be used to provide evidence.

2. China's Space Program

Before exploring the minds and the institution behind the space program, an important aspect is to analyze their flagship line of satellites, Dong Fang Hong (DFH) 1, 2, and 3.

The three-step goals of China's space program were to launch a rocket, then a 200kg satellite, and lastly a 1000kg satellite. The government allotted 200 million RMB to the Chinese Academy of Sciences (CAS). However, due to economic shortcomings, the project was delayed by Deng Xiaoping and Vice Chairman of the Chinese Communist Party (CCP) Chen Yun. The first satellite, dubbed Dong Fang Hong 東方紅, was China's entry into the frontier of space. Its name was taken from a Chinese communist folk song: "The East is Red". The Government wanted this first satellite to be visible from the ground, and broadcast messages that would be heard by the whole world. More specifically, Mao wanted this satellite to play the song it was named after all around the world, officially announcing China as an up-and-coming global power. Then, the 2nd revision of the project came to light, dubbed project 651, to develop China's first satellite, which was approved in October of 1967. The project was risky, and if something were to go wrong, it could destroy Qian's reputation and China's reputation. Some of these risks were that the launch vehicle itself was only partially tested, the satellite could potentially get lost in space, or the Americans could detect it before the confirmed orbit, taking away China's pride of giving the announcement themselves. Another more nuanced risk would be that the song could be distorted and garbled, turning it into an international joke. Despite these risks, the potential glory and international recognition would be too much to pass over. This first mission fulfilled China's political need to show that it was an emerging international power. The rocket that was designed to carry the DFH-1 is the 長征 (*Chang Zheng* meaning "Long March", hereafter CZ) rocket. Much of the CZ's technology and design were adapted from the 2-stage Intercontinental Ballistic Missile 東風四號 (East Wind 4) (Wei 235) and it was not verified to be able to carry a satellite into space reliably. Finally, after 19 rocket launch tests, the first successful launch of DFH-1 aboard the CZ was on April 24th, 1970, officially making China the fifth country to launch a satellite. Even though this project seemed solid and unwavering, it has managed to survive through the 581 delays only because it was part of Mao's ambition, better known as the 兩彈一星 program, or "Two Bombs, One Satellite" (Wei 235).

The government mounted a propaganda campaign on the importance of the space program so that people would approve of it. They associated space travel with national pride, and governmental responsibilities to serve the people and provide services such as weather monitoring and disaster management. This proved to be highly successful: the population found pride in the space program, and millions of families named their children *Weixing* ("Satellite"). A reconstruction of this moment by the journal China Reconstructs shows the public reaction to the launch of DFH-1: When the news was announced, the whole nation was jubilant. Everywhere in town and country, large crowds gathered beside radios and loudspeakers to listen to

them, to listen to the press communiqué and hear the music of the DFH in praise of the great leader chairman Mao being transmitted by the satellite. In every city hundreds and thousands of people poured into the streets carrying portraits of Chairman Mao, singing and dancing. The air resounded with the boom of drums gongs, the sputter of firecrackers and cheers of 'Long live Chairman Mao!' 'Long live the Communist Party!' " (Wei 241).

3. Qian Xuesen & the Fifth Academy

After a recapitulation of China's space program, we can analyze the scientific institution behind the landmark achievement of DFH 1. The creation and the establishment of the Fifth Academy marked the birth of the Chinese space program. On February 17, 1956, Qian Xuesen, a Chinese born, American educated scientist returned to China with a proposal to the central government titled: "A Proposal to Establish China's Defense Aviation Industry". This gave the government a road map to develop a missile program. Prior to Qian's return to China, Marshall Nie Rongzhen was also instrumental in establishing the Fifth Academy, as he submitted a proposal entitled "An Initial Proposal to Establish Missile Technology Research in China". Two weeks later, the Premier of China, Zhou Enlai approved this proposal, and officially made the Fifth Academy part of the military. In the following 3 years, the Fifth academy started its own development of rocketry along with the Soviets. However, after the Sino-Soviet split in 1960, Marshall Nie strongly believed that in order for a country to be strong, they need to be self-reliant and not dependent on an external superpower (Chen 73). The Fifth academy continued to progress after this setback, but due to numerous challenges and halts in development, years later when developing their missile program, China would once again ask themselves whether they should compromise their pride and principles in order to gain more advanced technology.

Even so, social turmoil did not stop the Fifth Academy. During this time, the loss of manpower and labor in factories and the economic downfall of the country resulted in a slowing down of progress in many fields. However, despite these setbacks, it did not stop the development of the nuclear warhead and missiles. This view on forced development and relentlessly pushing forward was further affirmed by Mao Zedong and Zhou Enlai, who continued to authorize large scale construction of space related facilities (Chen 65-78). Then came the biggest halt of the Fifth Academy. All the scientists of the Fifth Academy gathered outside to melt and forge metal. This left no manpower to do actual rocketry. This was a result of the "Surpass England, catch up to America" movement designed to pull everyone to boost economic production and shipping. This program was plagued with unattainable expectations and crudely made steel, eventually resulting in the program's failure, halting many other aspects of industry along with it. Then came the Great Famine. During this horrific period when food was rationed everywhere, when it was available at all, the military scientists were cocooned. Fifth Academy scientists received 38 *jin*, or 19 KG of rice and corn a month. In comparison, university professors only got 28 *jin*. In these harsh times, anyone who wasn't directly related to the furthering of China's political goals was overlooked.

We can see that the development of the Fifth Academy was driven by politics as much as technology, if not more. Even when the Red nation faced impending threats and dangers such as social turmoil and a famine, instead of distributing food and resources evenly to the public as a communist nation would, they pooled their resources into funding the development of rockets and missiles. None of this is as evident as the amount of food these scientists received, 38 *jin* instead of a professor's 28 (Chang 242). Therefore, we can conclude that the initiative of the Fifth Academy was to further the Chinese Government's political goals. Now we turn to Qian Xuesen, the head scientist who started it all, and analyze his motivations and scientific career.

4. Qian Xuesen's Career

There are many names irrevocably associated with developments for space programs: Tsiolkovsky, Korolev, Glushko, and Chelomei for Russia; Goddard, von Braun, Faget and Kelly for the US; Qian Xuesen for China. Born in Hangzhou, 1911, he attended Jiao Tong University, then emigrated to America in 1935. He studied at MIT for one year, then moved to Caltech and graduated with a doctorate degree (Harvey 18). Studying under Professor Theodore von Karman, he played a key role in America's attempt to build a rocket program in WW2 (Chen 64). Consequently, after China's liberation in 1949, He heeded Mao's call to return to China to build a better society. Much to his dismay, during this same time, the McCarthy Witch Hunt took place, and due to the extent of his missile knowledge, he was accused of being a communist, and was imprisoned (Chang 191-198). Interestingly, while under surveillance, his captors thought he was writing in code, but it just turned out to be logarithmic tables

(Harvey 20). In the end, thanks to professor Lee DuBridge and Theodore from Caltech, they managed to get Qian out of prison. Eventually, the Chinese and the American Governments compromised to release Qian and other Chinese scientists in exchange for the release of 76 American prisoners. When he returned to China, Chairman Mao commissioned him to develop military rockets for China (Harvey 21).

Qian's contributions to the Chinese space program cannot be understated. Being the head scientist of the Fifth Academy and the director of CAST (Chinese Academy of Space Technology), he personally trained four scientists under his wing to work on the projects. Because of his experience working in the field of rocket science in America, he was able to bring many technologies to China. In 1962, Qian started training four scientists, and met with them three and a half hours each week. Qian urged these scientists to study English. This was because most of the available information on rocketry and satellite technology was actually published by the Americans and not the Soviets. In January 1965, Qian drafted a proposal to the government, saying that there was enough rocket infrastructure to facilitate a launch of this magnitude, and subsequently, a space program (Chang 226). This is particularly ironic because America hated communism and did not want China to develop their rocket technology, but by deporting Qian back to China amid the McCarthy Witch Hunt, they sped up China's development more than they could imagine. This event again shows how national and international politics can tangle and propel science, even unintentionally. Without Qian, China's development of rocketry would have been set back years. Despite the lack of technology available in China at the time, Qian made do with what he was given and worked on in the past.

Politics is about the people involved in those political decisions, whether it be as a puppet or a manipulator, and Qian's life after he returned to China is an interesting case study to exemplify this. Qian epitomizes China's political situation and mindset from the Great Leap Forward and past the Cold War. This is the history of the infamous scientist who many blame to be responsible for the Great Famine.

On the surface, Qian did not show any ill towards America, publicly saying that China wishes to be friends with the American people, just not the American government. On his former colleague's 75th birthday, however, he sent a letter to Caltech that mystified them, criticizing his teacher von Karman that all of this monumental work does nothing but bring harm to others, while his own science helps 900 million. This tore his teacher to shreds. Nobody apart from Qian himself knows if this was from his heart, or just forced political propaganda by the Chinese government (Chang 234-235). 1958 was the year Qian became a hardline politician. On the June copy of the magazine *Kexue Dazhong* 科學大衆 (Science for the People), he wrote a controversial article saying that a field of crop's output could be increased 20 fold, as long as there was enough water, manure, labor, and sunshine (Chang 240). Many scientists found this article ridiculous and intolerable, but the article was well received by Mao, who turned a blind eye to the inescapable scientific issues. Another example of his political skew would be during the anti-rightist movement, some of his colleagues openly said "I will not join the Communist Party", and thus a group of six scientists were purged. As a response, Qian openly stated that his former colleagues were nothing more than "liars and political maneuverers, without even a little of the scientists' nature" and "an ambitious politician of the most vile and savage type"(Chang 236). On March 3rd 1958, Qian published in an article "[For] our old scientists - the leaders of the scientific ranks - their responsibility is great. They must be able to mobilize the masses, and rely on the masses. But if they are able to do this, they must not only resolve to be red, they have to really be red, red all the way through. [They] must burn away all vestiges of bourgeois thoughts, and all sorts of arrogant and self-important, selfish and self-serving ideas…."(Chang 238-239). Then on April 28, he wrote another article in the People's Daily, chastising himself for losing faith in the space program, claiming that he had been too bourgeois and too elitist to think that uneducated people could build a missile. While we do not know whether or not the Chinese government coerced him into writing this article, fellow scientists think he did it willingly. In the following years, he became the face of the space program, akin to Werner von Braun to the Americans and the Germans. The contrast here is stark. Over the course of a few years Qian went from publicly denouncing the idea of communism to embracing it with overt fervor.

As we can see from the analysis of Qian's life, his life and political views took a hard turn after his return to China. During his time in America, he denounced the idea of communism, but when he had the chance to join the communist party, he was ecstatic. Obviously, there was a journey to get from point A to point B, but his motivations and ideals are never truly understood. When the father of the Chinese Space Program is a

tenacious politician, the spearheaded direction will be to further political goals.

5. The Aftermath: DFH 2 & 3

Before Mao's death, he was amazed by the USA's satellite communications technology (TV), and as a result, China started to develop their own communications satellites, named project 331, along with the Long March 3, the rocket to launch it. There were many technological challenges to overcome. Firstly, they considered whether the satellite will have a 12-hour orbit or 24-hour orbit cycle. The 24-hour orbit cycles, better known as geosynchronous orbits, are harder but have a longer flight path that can provide benefits such as continuous coverage. In the end, they settled on the geostationary orbit. In 1980, the Chinese government attempted to contact NASA about acquiring a satellite, but nobody knows the outcome of this decision. The first launch of the Long March 3 and the satellite was met with numerous problems, with one of the main issues being the guidance platform broke down, meaning the rocket could not be controlled during ascent. The second launch came on January 29th and was successful up until the stage 3 engine failed at low earth orbit. This left the satellite to be stuck at low earth orbit. On 8th of April 1984, DFH -2 Comsat was set to launch, and this time, it was successful. On May 24, the whole system was declared operational, and General Zhang Aiping made the first phone call in China to Weng Enmiao. Dong Fang Hong 2 had a predicted lifespan of 4 years, with 20000 solar cells onboard. The main capabilities was 5 TV channels, and it could make 3000 phone calls at a time, in actuality, the DFH-2 lasted 10 years. The next iteration of Dong Fang Hong 3 is significant as it has 20% Western influence in design. The Chinese reached out to Germany to help design DFH3, and with international cooperation it was estimated to be able to connect 8000 phone calls at a time. In July 1987, an agreement had been reached, and the Germans were responsible for designing the solar wings. The DFH-3 suffered three failures in a row in the span of five years, but finally on the 8th of May 1997, the DFH-3 was launched in the Long March 3A rocket. Despite the success of these communication satellites, Hang Wen described the Comsat system as "pitiful", as the entire country's technology was behind Western countries, stating that having great rockets with poor industry is useless. At the same time, in 1990, Australia worked with China to launch the Optus Satellite. This was meant for telecommunications in Australia. However, on the day of the launch, the engine shut off at the last moment while the platforms were released. Multiple workers went in to extinguish the fires without proper safety equipment. Nobody died, but most were hospitalized after breathing in toxic fumes. However, after the crash of Long March 3B that carried the Optus Satellite, the Western countries lost faith in China's rocket systems (Harvey 122-123).

Evidently, from the launch of DFH-1, its political intent was obvious, and the public reaction speaks for itself. DFH-1 is a clear attempt at broadcasting China to the world. But DFH-2 and 3 are much more oriented towards civil uses. It can be argued that the two communications satellites were developed for technological advances and scientific purposes. These two satellites do bring communications technology to the public, but this broadcasting technology is owned by the government and can be used for propaganda.

Conclusion

After analyzing the Fifth Academy, Qian Xuesen, Dong Fang Hong 1, 2 and 3, we see that the Chinese space program started because of political ambitions. Starting in 1958, Mao's intention for the first satellite was purely political. DFH -1 had no morsel of scientific intent. The nationalized Chinese space program was spurred on initially as a political response to the American and Soviet space race. China's desire to prove themselves as an independent superpower drove the establishment of the Fifth Academy and the development of intercontinental ballistic missiles which eventually lead to rockets and satellites. The first Chinese man-made satellite DFH-1 only had one purpose, to play revolutionary music and announce the country's ideology to the world. Politics thus pervades the project in its day-to-day conducting, and transformed individual scientists involved in it. When the Fifth Academy was formed, even though it was an institution for researching rocketry, it was placed into the military division to develop missiles alongside rockets. Qian Xuesen turned from a scientist that denounced the idea of communism into a politician that heavily advocates for communism. While I do not agree with everything he says and does, I do think it was the only way science could have progressed in that era. Without government backing, rocket science and aerospace engineering would not have survived. What makes this China's space program so special is the heavily politicized space program, championed by Mao Zedong and Deng Xiaoping. While it was undoubtedly started as a political initiative, the telecommunications and other technologies that it brought to the entire nation cannot be understated.

In a more general context of the relationship between politics and science, the case of the DFH satellites raises the hard question as to what extent these scientists allow politicians to dictate their agenda. The plain fact is that in space science more than in any other sectors, scientists cannot work without government backing and funding. In an autocratic country like Maoist China, political bias and influence was hard to avoid because governments naturally want power over the advancements made by its scientists. In the end, scientists are faced with a dilemma: while it is almost universally agreed that science should remain unbiased with findings, the means that scientists rely on to reach these findings are often interwoven with politics. And this does not necessarily lead to negative outcome. One more recent example is the advent of the Global Positioning System (GPS), which was initially invented by the United States military involving a fleet of satellites to provide pin-point accuracy in any location around the world. This technology was eventually released to people around the world to use for free. Similarly, NASA's SMAP satellite today offers free forecasts of crop yields and soil fertility around the world in developing countries. US military undoubtedly has exercised political influence on these programs, although the scientists involved may not have themselves subscribed to the political agenda. While modern science and politics are likely to remain entangled, we can argue that scientists need to remain aware of the broader political and social impact of their scientific work to make good use of their science and to eventually exert constructive influence on the policy-makers.

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How Did Giuseppe Castiglione's Paintings of Horses Reflect the Encounter Between Chinese and Western Painting Traditions?

Yu-Hin Stanley Ip

Introduction

Throughout history, China's culture has been reshaped by several waves of intensive contact with foreign countries. One of the most significant points of contact happened between the 16th and 18th century when European missionaries arrived, sparking an era of exchange and interaction. This exchange took place not only on the level of material goods and products, but also through the intermingling of knowledge, ideas, and in the arts. One of the most evident examples is illustrated in the encounter of China and the West in the fusion of artistic technique and content. Who and what stimulated such change in China's traditional paintings, and where are these changes most evident? This paper aims to explore this encounter through the lens of the horse paintings of the Qing Dynasty, drawn by painter Giuseppe Castiglione.

1. Life and Work

Giuseppe Castiglione was an Italian Jesuit and painter, born in Milan in 1688. Entering the Society of Jesus at 19, Castiglione was valued among his confreres for his artistic talent and therefore earned the right to become a missionary in China in 1714 (Beurdeley and Beurdeley 11). Upon reaching China in 1715, Castiglione was summoned by Manchu emperor Kangxi 康熙, under the supervision of fellow Italian priest, painter, and engraver, Father Matteo Ripa. Appreciating poetry, painting arts and literature himself, emperor Kangxi permitted Castiglione's stay in Beijing and offered him a place in the Imperial Workshop, marking the start of Castiglione's new life in China. He would then become well known under his Chinese name, Lang Shi Ning 郎世寧, a painter and architect crafting artwork for emperors Kangxi, Yongzheng, and Qianlong. His works ranged from portraits of animals such as dogs and horses, and still life, to large-scale landscape paintings, which gained him recognition and appreciation from the emperors at the time. Castiglione was also famously responsible for the lead design of the Old Summer Palace 圓明園. Working with Chinese painters in numerous collaborations, and in sharing his expertise, Castiglione's paintings stand out among other European painters who strove to unify China and Europe through art. His work is representative of the skillful unity of painting traditions, and established a middle ground between the East and West (Beurdeley and Beurdeley 11).

2. Horse Painting in Chinese and Western Traditions

The horse is a common theme in many of Castiglione's paintings. In both China and Europe, horses were regarded as more than a form of transportation. In Europe, the horse appears very frequently in equestrian painting — portraits depicting knights, kings, or noblemen on horseback. Horse riding was therefore treated as a noble art and as a medium of learning and demonstrating virtue and one's leadership skill-set (Edwards 80). In the Pferdt-Schatz, a German book regarding horsemanship written in 1664, horse riding is seen as a performance — requiring sufficient theoretical and physical knowledge obtained by endless training and instruction. It requires an equilibrium and empathy at an emotional level and therefore accompanies the virtues of a great leader. Men learned to distinguish between a leader and a commoner, to exercise authority, and to punish and reward with moral rectitude (See Figure 1., Figure 2.).

In Chinese painting traditions and culture, on the other hand, the horse is often used as political rhetoric and metaphor, describing an emperor or ruler's ability to reward accordingly, and distinguish between the ordinary and talented. In Tang Dynasty writer, politician and philosopher Han Yu's 韓愈 "Disquisition on Horses" 《馬說》, the author

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describes a caretaker's inability to recognize the exceptional in a crowd of ordinary horses, feeding the special few indistinctively with the ordinary, hindering their potential whilst complaining about the lack of extraordinary talent. The author points out that likewise, those who are in power, are not enlightened enough themselves to recognize the worthy and deserving. The connoisseur's ability to select good horses is therefore likened to the ruler's ability to differentiate between the talented and mediocre.

Adding a different dimension to the horses' place as a political metaphor in Chinese culture, Yuan Dynasty painter Ren Renfa's 任仁發 "Two Horses" 《二馬圖》 (See Figure 3.) depicts a fat and lean horse, reflecting the crippling corruption that exists in the palace, and in society. The fat horse with its leash free represents officials who uncontrollably feed off public expenses for their own gain, whilst the lean horse with its leash tied to its own throat represents those who suppress their greed to act for the betterment of the country and the people, and as a result have thinned to the bone for their exhaustive and tireless work. This was a harsh feat of criticism towards the Yuan court at the time of its creation (Silbergeld and Wang 290). Horses were also associated with power and authority, due to the fact that they were essential to victory in battle, and therefore in the establishment of political rule. These elements of culture and tradition revolving around the horse can be seen in some of Castiglione's most celebrated pieces. Below, three of Castiglione's artworks are analyzed to illustrate this.

3. Combining Chinese and Western Techniques

Castiglione's "One Hundred Horses" 《百駿圖》 (See Figure 4.) is known as one of the painter's most monumental large-scale artworks; praised for his efforts in marrying Chinese and Western painting traditions in technique this is a general starting point in presenting Castiglione's unity of Chinese and Western painting traditions today. The painting depicts one hundred horses across the landscape, the horses varying in the color and pattern of their hides, in posture, and even in their state of health. The painting also depicts several men who are distinctively *Manchu*, as evidenced by their *Manchu* clothing and horse-taming. We can compare Castiglione's lean horse to Ren Renfa's "Two Horses". At first glance, it is evident that Castiglione's depiction of the lean horse is more lifelike and realistic. He emphasizes bone structure in the spine, shoulders and pelvis, and muscle fibers and veins in the neck - depicting the horse's skin as bonded in a sickly fashion to its bones due to the lack of fat and flesh. Castiglione achieves this through the manipulation of light, shadow, and the contrast and vividness in color to emphasize objects in the third dimension, instead of relying on line, as Chinese artists do. This can also be shown in comparison to Gong Kai's 龔開 "Emaciated Horse" 《駿骨圖》 (See Figure 5.) painted in the Yuan Dynasty, in its thick and emphasized lines of the rib cage and spine. Castiglione's depictions of horses are also more anatomically correct and proportional, than the irregularly large ribcage shown in the paintings of both Chinese artists (See Figure 6.).

This, however, in no way suggests Chinese painters as inferior in artistic talent and technique. In the Tang Dynasty painter Han Gan's 韓幹 "Night-Shining White" 《照夜白圖》, we learn that the aim of a painter is not to depict or capture the appearance of the subject, but to capture its inner essence. Therefore, painters shall reject the use of color, changeable qualities in light and shadow and other dimensions of expression to solely rely on the line. The widely celebrated painter Gu Kaizhi 顧愷之 similarly recommends fellow painters to "draw essence from shape" (以形畫神). This emphasis on line and shape over light and shadow also derives from a Chinese painter's training in calligraphy (Hearn 3). Paintings were often accompanied by text, poetry, calligraphy, and literature. These elements work together to express the mind and emotions of the artist, and to bring life, meaning and symbolism to the subjects drawn.

Trained as a European Jesuit and painter, much of Castiglione's training revolved around the accurate depiction of objects. Castiglione also employs Western perspective in his paintings. The painting is drawn from a low-angled perspective, in which subjects close to the foreground are drawn with a distinct difference in scale to objects closer to the horizon line. Chinese paintings, however, rarely employ perspective. For example, in "The Qianlong Emperor's Southern Inspection Tour" 《乾隆皇帝南巡圖》, a grand painting of even larger scale (See Figure 7.), subjects are depicted with no variation in size throughout the expanse of the artwork, where the concept of near, far and perspective are not evident.

To further indicate Castiglione's use of Western painting techniques, Castiglione's "Ten Steeds - The Buckskin horse named Ruyi" 《十駿圖-如意驄》 (See Figure 8.) can be compared to Song Dynasty painter Li Gonglin's 李公麟 "Five Horses" 《五馬圖》 (See Figure 9.). On the far right end of the

painting, a horse with a darkening gradient and circular hide pattern is drawn, akin to Castiglione's painting of the same horse. In depicting the horse's snout, Castiglione uses the differentiation in light and shadow to illustrate variations in surfaces, depicting the structure and muscles along the face of the horse. This technique is called 'Chiaroscuro', the contrast between light and dark in modeling volume, and a third dimension (The Editors of Encyclopaedia Britannica). In the same area, however, Chinese painter Li Gonglin simply applies the line to emphasize the horse's cheek, bridge of the nose, and snout. Castiglione further employs Chiaroscuro in emphasizing flesh, and proportion, shown in the folds running down the horse's legs and a subtle bulge in the horse's shoulder to illustrate its shoulder muscle (Mungello 40). In Li Gonglin's painting, in contrast, the shoulder muscle is again depicted by line. Regarding the accuracy in depiction, Castiglione's illustration makes use of vivid colors to depict depth in its hide patterns, darkening gradient running down its snout, a lifelike depiction of its silky hairs in its mane, and reflections in its hooves and eyes. These dimensions are not as apparent, or realistic, in Li Gonglin's painting.

4. Portraying the Manchu Emperor

In Castglione's "The Qianlong Emperor in Ceremonial Armor on Horseback" 《乾隆皇帝大閱圖》 (See Figure 10.), the artist brings Western content and technique in painting traditions to the common portrait. The painting depicts the emperor in his twenty-ninth year of age performing a grand military inspection. This inspection was held every three years, during which the emperor reviews the Eight Banner Troops in their battle deployment skills, and examines tactics and military equipment at Nanyuan (an imperial hunting reserve near the South of Beijing). This is to maintain the army's capability and power, to preserve ancestral roots, and to declare the emperor and country's military prowess (Elliott 61). Here, Castiglione again employs Western painting techniques. He replaces the use of line with light and shadow, emphasizing the third dimension, highlights hairs, muscular structure, and even light reflections of the hooves of the horses.

Most notably, he reenacts a major theme of Western painting traditions: Chinese emperors, particularly those belonging to the Han Chinese, were very often portrayed sitting on the throne in an imperial robe, only occasionally appearing on horseback in portraits. In Western traditions, however, as stated before, the equestrian painting was a common theme that appeared in depicting powerful and noble men. This demonstrates Castiglione's clever and skillful reenactment of Western painting traditions in equestrian paintings and its positive attributes.

It is also important to note that emperor Qianlong belonged to the *Manchu* - wherein Manchurian heritage, horse riding and mounted archery played a large role in the culture of his people. Indeed, the emperor is also portrayed with a quiver loaded with arrows with vividly patterned feathers, in his armor and with a whip in hand, evidencing Castiglione's attempt in appealing to the emperor's *Manchu* roots. Qianlong placed great importance on the ancestral qualities of the *Manchu* under his reign, as the banner troops practiced horse riding and shooting with the emperor, both finding value and pride in their talent and their unparalleled skill in waging war on horseback which played a large role in establishing the Qing Dynasty by conquest (The Editors of Encyclopaedia Britannica).

Castiglione's artworks thus reflect the encounter between Chinese and Western painting traditions. However, the encounter was not all-encompassing, as Castiglione also failed to grasp certain elements of the Chinese heritage. As stated before, in Chinese culture, the horse is often drawn as political rhetoric. A lean horse is used to criticize a leader's ability in distinguishing and accordingly rewarding true talent, whereas the fat horse symbolizes a corrupt official. Many of such cultural subtleties around the horse are lost in Castiglione's paintings. Although many of Castiglione's horses are likely imitations of classical horse paintings by artists such as Ren Renfa and Li Gonglin, only the aesthetic of the horse is brought to Castiglione's pieces, omitting metaphor and symbolism. The appearance of a lean horse in the "Hundred Steeds" clearly carries no intention of political criticism.

Nonetheless, we must remember that these paintings were created under the reign of the *Manchu* emperors. Castiglione's horse paintings may be driven by his intent to appeal to the *Manchu* equestrian tradition. Many of Castiglione's other paintings depict animals that the *Manchu* were fond of, such as the dog and falcon. In his many "Painting of Triumph" 得勝圖, Castiglione depicted wars and sieges with the Manchu army on horseback, emphasizing the strength and dominance of the Eight-banner troops. These paintings are evidence of Castiglione's attempt in appealing to the emperor's *Manchu* roots, using a combination of Chinese and Western artistic languages and painting techniques (Elliott 66).

Conclusion

Castiglione's paintings capture the incorporation of Chinese and Western painting traditions, which both cultures have developed and flourished in the arts, forming largely contrasting painting techniques, purposes, hidden symbolism and metaphors. He implements Western techniques such as Chiaroscuro, perspective, and vivid colors to achieve accurate depictions, and reenacts classical Chinese models of horse paintings. Although some elements of the Chinese tradition, such as the use of horse images as political metaphor were lost, Castiglione's artwork stands out as a successful integration of two painting traditions with further-reaching significance beyond the imagery of horses.

Figure 1. Rubens, Peter. "Portrait of Crown Prince Władysław Vasa with the Battle of Khotyn." 1625. Oil on Canvas.

Figure 2. Clouet, Francois. "François I of France on Horseback." 1540. Oil on Oak Panel. Art UK,

Figure 3. 任仁發.《二馬圖》1254—1327, Ink on Paper. The Palace Museum, https://www.dpm.org.cn/collection/paint/234555.html

Figure 4. Castiglione, Giuseppe.《百駿圖》1728, Ink on Paper. National Palace Museum,

Figure 5. 龔開.《駿骨圖》1222-1304, Ink on Paper. Osaka City Museum of Fine Arts

Figure 6. Inland Valley Humane Society. Emaciated horse, 2011. Photograph. The New York Daily News. https://www.nydailynews.com/news/national/emaciated-horse-found-abandoned-calif-field-humane-officials-nurse-momma-hunt-owner-article-1.955295

Figure 7. 徐揚.《乾隆皇帝南巡圖》, 1751, Ink on Paper. National Museum of China.

Figure 8. Castiglione, Giuseppe.《十駿圖-如意驄》, 1649-1911. Ink on Paper. National Palace Museum. http://www.wincheer.com.tw/D-A21.htm

Figure 9. 李公麟.《五馬圖》, 1049-1106. Ink on Paper. Osaka City Museum of Fine Arts,

Figure 10. Castiglione, Giuseppe.《乾隆皇帝大閱圖》, 1739. Ink on Paper. The Palace Museum, https://www.dpm.org.cn/collection/paint/228806.html

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John Dudgeon (1837-1901) and his Unusually Positive Attitude towards Chinese Hygiene Practices

Tian Yu Tatiana Zhang

Introduction

From 1840 to 1842, Britain waged the First Opium War against China to protect its merchants' lucrative trade of smuggling opium into the country. In the wake of this military victory, British medical missionaries arrived in China, practicing Western medicine in the hope of attracting patients to Christianity. Many held unfavorable views of the sanitary conditions in the country, using the term "hygiene" to justify their scientific racism. British practitioners' disapproval of Chinese hygiene practices was a way in which they affirmed their superiority. Their existing sanitary theory, as described by the British historian John Pickstone, regarded epidemic disease as "primarily the product of dirt and decomposing matter; it was concentrated in towns and especially in the least sanitary districts" (Pickstone 126). When British colonizers arrived in India and then in China, they drew on this theory to disparage indigenous habits as unhygienic and unhealthy. Scientific racism of this sort further encouraged Europeans in China to live in segregated sectors of the treaty ports, whilst holding contemptuous views of Chinese medicine and hygiene practices (Rogaski 100).

However, there were a few exceptions who discorded this European sense of superiority, and amongst them, John Dudgeon made the most lasting impact. He challenged the then common definition of good personal hygiene practice, arguing that the Chinese had many important lessons to teach the Europeans with respect to their health. He questioned European contemporary sanitation theories and strongly criticized Europeans' intemperate habits. As historian Ruth Rogaski put it, "Dudgeon's observations marked one of the last moments that a European would simultaneously condemn Chinese lack of sanitary science and praise Chinese approaches to healthful living" (103). In this paper, I shall investigate the paradox in two ways: by delineating the evolution of Dudgeon's medical outlook, and by analyzing the various factors which contributed to his newfound understanding of sanitation.

I argue that Dudgeon's eventual appreciation of Chinese hygiene practices originated from his personal experiences, social contacts, and Presbyterian moral values. His tragic childhood inspired him to pursue the study of medicine, which in turn brought him to China. While in China, he had the opportunity to work very closely with the upper echelons of society. He constantly interacted with aristocrats and high officials, allowing him to gain a more sophisticated understanding of Chinese hygiene practices and their underlying theoretical principles. Finally, born into a Presbyterian family, Dudgeon also bore a set of ethical standards that could have shaped his eventual positive appraisal of the traditional Chinese way of life.

This essay will be divided into four sections. The first section will offer an overview of Dudgeon's life and career: how he, as a practicing doctor and a prolific writer, observed and wrote about various medical and cultural subjects. The second section will explore his appreciation of individual hygiene practices of the Chinese, both the more sophisticated Tauist medical gymnastics and the everyday lifestyle habits of the common people. The third section will consider Dudgeon's appreciation of traditional Chinese hygienic infrastructure and how, according to Dudgeon, it played a key role in the prevention of disease in China. The final section will discuss Dudgeon's idiosyncratic views as a whole, and how these led to his criticism of European society, with wide-ranging moral implications.

1. Life and Career

Born on the 7th of April, 1837, John Hepburn Dudgeon spent his childhood in Galston, Ayrshire, Scotland. Soon after the death of his mother in 1844,

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Dudgeon's father brought the family to Staffordshire, England, to start a new stage of their lives, but were instead met with more disasters. Within two years of their arrival, all of Dudgeon's family members had passed away from various diseases, of which cholera was the greatest culprit. Having lost his loved ones, the traumatized 18-year-old boy began to pursue an education and a career in medicine, taking medical courses in Edinburgh and Glasgow (Gao 48).

Dudgeon eventually chose to work overseas. In 1862, the London Missionary Society appointed Dudgeon as a medical missionary and dispatched him the following year to Shandong, where he opened a dispensary in 1864. Three months later, following the retirement of William Lockhart (1811-1896), the first British medical missionary to China, he moved to Beijing, where he served as a medical officer to the Chinese Imperial Maritime Customs Office and as a physician to the British Legation (Li 21-33). Unfortunately, tensions only grew between Dudgeon and the other missionaries over time. His superiors often criticized him for his lack of attention toward the people's conversion to Christianity. As a result, he resigned from the London Missionary Society on the 31st of December in 1884 and left China for Britain. However, he soon returned to China in 1886 and remained in Beijing until his death in 1901 (Li 21-33).

In Beijing, Dudgeon's career took a drastic turn, and consequently so did his appreciation of Chinese hygiene. In 1867, he was asked to save the life of a 9-year-old boy, whose father was Tan Baoqi 譚寶琦, a minister in the Late Qing court. Earlier that day, the boy had accidentally stabbed his stomach with a weapon and, after Dudgeon's rescue, recovered within ten days. Tan Baoqi himself, having suffered from gangrene of the back, also witnessed Dudgeon's exquisite medical skills (Gao 152). He lauded the physician, saying that "the name of the Venerable Dudgeon overflows in China "[德公之大名乃洋溢於中國]" (Gao 153).

In the same year, Dudgeon also treated Jia Zhen 賈楨 (1798-1874), a then 69-year-old chancellor from the Imperial Printing Office at the Wuying Palace 武英殿. In the autumn of 1866, a seizure paralyzed the right half of Jia Zhen's body. He was unable to perform everyday activities, such as walking, writing, eating, or even speaking. However, after employing Dudgeon, Jia Zhen recuperated and shortly afterwards was able to write and use his chopsticks with ease (London Missionary Society 104). This caught the eye of the Tongzhi Emperor 同治帝, since Jia Zhen was a significant figure in the Qing court (Horae 372). With interactions like these, Dudgeon developed a network with the senior members of the Qing court, which served a major role in forming his opinion on Chinese sanitation.

Other officials also spoke highly of Dudgeon. Chongshi 崇實, another minister of the Qing court, discussed the qualities of a "good doctor" (*liangyi* 良醫) in the preface of Dudgeon's book *Xiyi Juyu* 西醫舉隅 [*Epitome of Western Medicine*, 1875]. He described Dudgeon as such: 「英國德子固醫師，不遠輸萬里，來京師施醫，十餘年間活人無算，而絕不對收一錢，仁人君子只用心在斯乎」[The Englishman, Master Dudgeon has come to our capital city from thousands of miles away as a doctor. He has saved countless lives without accepting a penny. He is a benevolent gentleman whose heart is here] (Gao 203). Because Dudgeon embodied the qualities of a *liangyi*, he was widely accepted by the Chinese elite whose values aligned with his. These officials opened doors for Dudgeon to become the first professor of Western anatomy at the School of Combined Learning 同文館, the government-run college which trained diplomatic staff in foreign languages and Western science. He thus got into contact with the most enlightened Chinese and involved himself in the formation of China's first modern diplomatic institutions, such as the Office of Foreign Affairs 總理衙門 (Gao 257-259).

In fact, Dudgeon was the writer and editor of multiple textbooks of Western medicine used in the School of Combined Learning. In 1875, he published a color atlas of anatomy called the *Comprehensive Atlas of Skeleton, Viscera and Blood Vessels of the Human Body* 身體骨骼部位臟腑血脉全圖. In 1881, he published *The Epitome of Western Medicine* 西醫舉隅 in *A Review of the Times* 萬國公報, a monthly missionary publication, mainly concerned with anatomical concepts. In 1886, The School of Combined Learning released Dudgeon's textbook *General Study of Anatomy* 全體通考, based on the very popular anatomy textbook at the time, *Gray's Anatomy* by Henry Gray, which had immense influence on the development of medical education in the Late Qing (Gao 266).

Most importantly, Dudgeon befriended the esteemed Zeng Jize 曾紀澤 (1839-1890), one of China's earliest ambassadors to London. This ambassador is most known for the Treaty of St. Petersburg of 1881, generally celebrated as a diplomatic triumph for the Chinese (Hummel 747). Zeng Jize was one of the most prominent statesmen of that time with progressive ideas. He played an important role in the Self-

Strengthening Movement 洋務運動, which directed the country's military and industrial modernization.

Dudgeon and Zeng shared a close friendship, and Dudgeon featured more frequently than anyone else in the last forty-two months of Zeng's life (Gao 166). Although Dudgeon was Zeng's family doctor, observations in Zeng's diary show that the two had many *jiutan* [long conversations 久談] that went beyond a strictly doctor-and-patient relationship (Zeng 1741). Their close relationship proved to be an invaluable springboard from which Dudgeon gained access to the most educated bureaucrats of China. For example, his family's influence in the court paved the way for Dudgeon's involvement in Sino-British diplomatic dealings. Zeng's help to Dudgeon can be most exemplified by his support for the Anglo-Oriental Society for the Suppression of the Opium Trade. Contrary to the Qing government's response, which had been hesitant and slow, Zeng Jize not only firmly believed in the anti-opium cause, but also understood how to communicate with the British government as the representative of elite officials of the Chinese court. In other words, Zeng Jize was the reason for Dudgeon's faith in the competence and wisdom of the Qing government, a faith not shared by other missionaries (Gao 172-173).

The people that Dudgeon generally interacted with were representative of the Chinese elite circle who had a paramount place in the political establishment. Very well read in the Classics, these officials all received a thorough, traditional education, while also holding an enlightened perspective committed to modernizing China. Dudgeon would have been influenced by his interactions with them. With these men standing at the intersection between tradition and modernity, it is no surprise that Dudgeon, too, began to develop an appreciation of the Chinese approach to health.

This prolonged interaction with the upper classes in Beijing set Dudgeon apart from most of his contemporary Western peers. It also significantly reshaped his attitude toward Chinese hygienic concepts. We can retrace this evolution in his more than twenty books and articles written over the four decades of his career in China, which contain a wealth of medical and ethnographic observations concerning the sanitary and hygiene practices of the Chinese. The following analysis will focus on the most influential of these works, particularly the *Medical Reports of the Chinese Imperial Maritime Customs* (1871-1875*), The Chinese Arts of Healing* (1869-1872)*, The Diseases of China: Their Causes, Conditions, and Prevalence* (1877), *Diet, Dress, and Dwellings of the Chinese In Relation to Health* (1884) *and Kung Fu, or Tauist Medical Gymnastics* (1895*)*.

2. Appreciation of Individual Chinese Hygiene Practices

Not unlike his Western peers, Dudgeon was unimpressed by Chinese medicine in the early years of his career as a medical missionary. In his words, Chinese individuals exhibited "a want of personal cleanliness", and the nation as a whole was "totally destitute of sanitary science" (Dudgeon 1877, 7). He viewed traditional Chinese physicians as quacks and sorcerers, claiming in the early editions of *The Chinese Arts of Healing* that they were charlatans out to make money from unsuspecting clients, practicing "false doctrines and demonical arts". The most "erudite and charlatan" healers pretended to cure "*omnia mundi mala*", meaning "all bad things in the universe", by means of various spells and incantations (Dudgeon 1869, 165).

These observations were formulated in the dismissive language typical of 19th century Western medical travelers in the East; but they are corroborated by many contemporary accounts from Chinese medical doctors. Supernatural and magical elements pervaded healing practices in China at that time. As the Chinese physician Qiu Jisheng 裘吉生 noted in 1915 in an article titled "Medical Customs of Shaoxing" [紹興之醫俗], published in the *Shaoxing Journal of Medicine and Pharmacy* [紹興醫藥學報], Chinese households abounded in healing methods that invoked magical powers, such as the entrance of the noxious *qi* 氣 into the body and the loss of the *hun* 魂 (soul), which had to be retrieved from the local Earth God Temple. Qiu's discussion of these practices demonstrates his own disapproval of such methods and China's need for medical reform (Andrews 27-28). Therefore, while Dudgeon's language was contemptuous and tainted by Western superiority, his observations were nevertheless valid. It is important to note that the "Chinese medicine" Dudgeon saw and rejected as unscientific is not at all the Traditional Chinese Medicine we know of today.

Over the years, however, Dudgeon grew more appreciative of Chinese hygiene practices. Although he initially found Chinese cities to be lacking in modern sanitary measures, he was very surprised to discover that local people living there, who were more heavily exposed to decomposing material, remained in a healthy condition. He writes that "it might be supposed from the physical conditions of Peking which I have attempted to describe that fevers and all

manner of epidemics would be most fatal". "The most remarkable thing", he continues, was that despite all the "filth, dirt, and smells", which people in the West could not imagine and could hardly describe, the residents nevertheless enjoyed "wonderful immunity" from epidemic diseases (Dudgeon 1877, 12). This led him to reflect on Western medical doctrines he had been schooled in and had long taken as self-evident: "The sanitary legislation in the Western cities is based upon the idea that disagreeable and offensive odors are necessarily deleterious to health. The conditions and mortality of Peking would seem to explode this belief" (Dudgeon 1873, 41).

He offered a systematic analysis of this apparent paradox in *Diet, Dress, and Dwellings of the Chinese In Relation to Health*, a book-length text he wrote for the International Health Exhibition in South Kensington in 1884. Addressing a British audience, Dudgeon claims that "ancient Oriental people have a good many lessons yet to teach in respect of living and practical health" (Dudgeon 1884, 258). In this book, he argues that, when all other ancient civilizations had already met their demise, the Chinese nation enjoyed unrivalled antiquity and vitality. He attributed this to the healthy lifestyle habits of China's people. For instance, they cultivated wheat, a valuable crop with flesh-forming and force-producing nutrients. They always drank boiled instead of untreated water. They ate a moderate amount of meat that rendered their constitutions less inflammatory. They wore light and wide clothing, enabling the individual to regulate the heat of the body to the season. They also preferred elevated houses with suitable exposure to the surrounding environment (Dudgeon 1884, 399-400).

Temperance in food and drink, as well as the simplicity of life, according to Dudgeon, had allowed Chinese healing to meet its "true object", that is, to "ward off disease" (Dudgeon 1895, 203). This was in line with the Chinese way of *weisheng* 衛生 [guarding life], an adequate approximation to the premodern European concept of "hygiene". *Weisheng* called for the preservation of health in a body, wherein the different vitalities were susceptible to depletion caused by the inevitable injuries of living. In order to avoid wear and tear, one must exercise self-restraint when performing all of life's essential activities. Food should be simple, physical activity should be limited, alcohol and sexual activity should be restrained, and neither happiness nor anger should be experienced at their extremes (Rogaski 44). Dudgeon even criticized the West for its "dissipation and depraved habits, intemperance and drink. The pace of modern life is rapidly filling our asylums. One of the very greatest evils, if not the greatest evil of the West, is the tendency to take alcoholic drinks to alleviate sorrow and depression of the nervous system" (Dudgeon 1884, 321). Their indulgence in alcohol had made their body prone to febrile conditions. Similarly, these people wrought havoc on their health by wearing woolen clothes in both summer and winter, "for absorbing, if not for assisting in the evaporation of the emanations from the skin". Because they sweated less than the Europeans, the Chinese enjoyed their "loose roomy cotton or gauze fabrics", which were better adapted to the climate, thus offering them greater immunity from disease (Dudgeon 1884, 332-333).

The rhythms of Chinese life were also more conducive to health. The "repose of body and mind is another of the important factors of Chinese health. There is repose of body... Nothing is done in a hurry... Nourishing the body is the object aimed at by all in health and in sickness" (Dudgeon 1884, 474). By "nourishing the body", Dudgeon was probably thinking of the Chinese concept of *yangsheng* 養生 [nurturing life], a synonym of the aforementioned *weisheng*, a concept encompassing a set of gymnastic practices, meditation techniques and dietary regimes, designed to preserve the vital energies and their unhindered flow inside the body (Rogaski 25). This idea epitomized the difference between pre-modern Chinese understanding of good health and the modern Western concept of hygiene.

Yangsheng is a set of techniques devoted to the prevention, rather than treatment, of disease as well as the harmony of the body, and increased longevity. Dudgeon recommended the exercises to his fellow countrymen, stating that "if a person can perform daily once or twice the exercises herein prescribed, his body will become strong and elastic, and no matter how many kinds of diseases he may have, all will vanish and thus will the vital principle exist in adequate quantity and life consequently will be prolonged" (Dudgeon 1895, 203). To this end, he dedicated a whole book, called *Kung Fu*, or *Tauist Medical Gymnastics*, in which he defined as *Kung Fu* as a "man who works with art, to exercise one's self bodily, the art of the exercise of the body applied in the prevention or treatment of disease, the singular postures in which certain Tauists hold themselves" (Dudgeon 1895, 5). He explains that "the cause of disease is invariably supposed to depend upon the presence of vitiated or depraved air having stealthily gained admittance" (Dudgeon 1895, 169).

This is a fine characterization of the meaning of *yangsheng*, as historians of Chinese medicine understand it: through concentration, visualization, and movement, the practitioner would circulate his vitalities, conserve the body's fluids, and direct the movement of *qi* to ultimately achieve perfection and equilibrium when *yang* 陽 descends and *yin* 陰 ascends. The breathing practices help one control the pressure and direction of the *qi,* in order for one to expel it from the internal viscera, aiding in the elimination of pathogenic *qi* from the body (Rogaski 42-43).

Dudgeon's writing illustrates a good grasp of the essential difference between traditional Chinese and modern Western medical theories. The former's understanding is an organic one, with heavy focus on the harmony between the microcosm that is the human body and the cyclical working of the macrocosm that is the universe in which the human resides. The latter's is a mechanistic one, that views the human body when sick as a machine invaded by foreign intrusive forces.

Furthermore, Dudgeon's understanding of Chinese medical theories was far from superficial, but theoretically underpinned by his extensive reading of Chinese texts. His *Tauist Medical Gymnastics* itself offered a translation of the Ming Dynasty treatise *Yanling Pian* 延齡篇 [*Treatise on Extending Life*], which he praised as a beautiful work of art. His other observations about Chinese medical principles were also consistent with canonical texts such as the *Huang Di Nei Jing* 黃帝內經 [*The Inner Canon of the Yellow Emperor*], an ancient Chinese medical text compiled by the 1st century BCE, that has been upheld as the fundamental doctrinal basis for Chinese medicine. For instance, in the fifth chapter of *The Inner Canon of the Yellow Emperor*, the author describes the relation between the *Yin* and *Yang* of man and all things and that of the four seasons:

> Heaven is situated up above, it is the accumulation of lucid *yang* above; Earth is situated down below, it is the accumulation of turbid *yin* below. *Yin* associates with calmness, and *Yang* associates with impetuous movement (Wang 31).

In the *Tauist Medical Gymnastics*, Dudgeon goes on at length, explaining the fundamental concepts of *yin* and *yang* as the two organic principles of Chinese medicine, "from the union of which man is made" (Dudgeon 1895, 199). He explains that *yang* represented vital heat, while *yin* resembled radical moisture and darkness. Chinese medical theories evidently put great emphasis on the balance between these complementary energies in the bodies. In essence, their definition of health revolved around the concepts of balance and equilibrium.

Dudgeon likened the dualistic forces of the *yang* and the *yin* to "two essences of the Sun and Moon" which "must unite to produce the myriad things of nature" (Dudgeon 1895, 151). Here Dudgeon presents the "two essences of the Sun and the Moon" in an objective, if not positive light, in stark contrast with other Western physicians who often stigmatized the Chinese understanding of medicine as "incorrect". He writes from the perspective of a Chinese *Tauist Medical Gymnastics* practitioner, describing the exercises as "indispensable" and their benefits as "great" (Dudgeon 1895, 151, 1).

3. Appreciation of Traditional Chinese Sanitary Infrastructure

Beyond personal hygiene practices, Dudgeon also thought highly of Chinese sanitary practices as social institutions. At the beginning of his career in China, though, he found the sanitary conditions deplorable. In his *Medical Reports of the Chinese Maritime Customs*, he drew parallels between the streets of Beijing and "a receptacle of all manner of filth" (Dudgeon 1873, 29). Dudgeon perceived China as a "vast cemetery studded over with mounds, the graves often yawning, either through long exposure to wind and rain or the ravages of dogs, foxes, or pigs" (Dudgeon 1875a, 33). He condemned the custom of keeping the dead for long periods of mourning before burial, which allowed corpses to decay and putrefy, causing disaster in "seasons of epidemics" (Dudgeon 1873, 30).

Dudgeon was by no means alone in his dismissal of Chinese sanitary conditions. For Colonel G.J. Wolseley (1833-1913), quartermaster to the British forces in the 1860s in Tianjin, also wrote to the same effect in his journal that "musty odors prevalent there detracted much from the charm of the scene, and rendered a frequent application of the pocket-handkerchief to one's olfactories indispensable" (Wolseley 29). Dr. Roderick J.J. MacDonald (1859-1906), a medical missionary of the Wesleyan Methodist Missionary Society, associated filth with depravity, where he drew a moral conclusion from poorly constructed latrines: "How can a people's language be expected to be polite who daily frequent such filthy places? How can girls preserve modesty who are obliged to see into all the ramshackle public latrines?" (22). Patrick Manson (1844-1922) and Augustus Müller (1841-1910), Chinese Maritime Customs Service medical officers, noted in 1872: "Luckily filth, overcrowding and bad food are not the

only factors necessary for the manufacture of typhus epidemics — were they so we should live in Amoy in perpetual dread of death" (11). These observations are also in agreement with the predominant sanitation theory of the Victorian age, when putrefaction and filth were deemed immense threats to health. In British industrial cities, one would find enormous accumulations of decomposing matter, such as in stagnant sewers and even in churchyards. English social reformer Edwin Chadwick (1800-1890) as well as German chemist Justus von Liebig (1803-1873) hence paid attention to putrefaction. They both viewed diseases as products of environmental "filth", a word Dudgeon and many other Western doctors in China regularly used to refer to the seemingly appalling sanitary condition of Chinese cities (Hamlin 381-384).

However, over time, Dudgeon started to look at the sanitary condition of Chinese cities differently, as Chinese immunity to diseases seemed to challenge Western medical preconceptions. As we have seen, his primary explanation was Chinese dietary habits and personal hygiene practices. However, he also saw great merits in traditional Chinese architecture, including the absence of boarded floors, the lack of dark and damp cellars, the dryness of walls and partitions, the presence of windows and ventilation, and the use of the *kang* 炕 stove. The layout of Chinese cities received his praise:

> "The streets are broad, permitting of the free circulation of air and the dilution of noxious vapors, thus rendering them harmless. The dangers arising from collections of decaying organic matter are obviated by the action of the oxygen of the air. Winds blow frequently and freely through Peking and other Chinese towns, the air is being constantly oxygenized and the putrescent matters it contains being destroyed" (Dudgeon 1884, 426).

He also commended the Chinese practice of collecting urban night soil, which was then transported and sold to the countryside as fertilizer. Dudgeon saw the manure collectors in Beijing as "among the most robust and healthy of our population", working diligently to remove the night soil before it did any damage to the urban environment (Dudgeon 1877, 12).

Dudgeon's increasingly positive appraisal of individual hygiene practices of the Chinese led him to a positive interest in Chinese medical theories; likewise, parallel to his appreciative view of Chinese cities, he delved into the theoretical underpinnings, namely the art of *Fengshui* 風水. Dudgeon concluded that "there is a good deal to be said for this principle in a modified sense as leading to the selection of beautiful sites" (Dudgeon 1884, 400). Dudgeon saw beyond the superstitions of the Chinese and noticed that there were certain elements of truth in them. He noticed that the geomancers consulted the locality and its relation to the neighboring natural influences, and subsequently chose sites that were free of urban pollution, high lying, and sheltered from the prevailing cold winds.

Interestingly, Dudgeon did not see the Chinese practice as uniquely Eastern, but belonging to a traditional hygienic common sense that the contemporary Chinese shared with ancient Greeks and Romans. He first compared the dwellings of those from the East to the housing arrangements of the Romans: the houses are entered through a door 門, the *vestibulum* of the Romans, leading to the court 院 or *atrium*. There is a reservoir for rainwater, the *impluvium*, and an open courtyard surrounded by verandahs, the Roman *peristylium*. Dudgeon then discussed the superstitions that came during the selection of a site, stating that "even Hippocrates had noticed that the higher elevated houses were healthier than those situated in low localities" (Dudgeon 1884, 400).

4. Dudgeon's Idiosyncrasies Explained

Why did Dudgeon hold such an idiosyncratic view on traditional Chinese hygiene practices and sanitary infrastructures, in such stark contrast with most contemporary Western observers? I argue that Dudgeon's view was shaped on the one hand, by his religious and moral beliefs, and on the other by his critical view of the hygienic conditions in the British society.

Dudgeon's praise of the health of the Chinese – healthy diet, work/life balance, repose of mind and body, well-ventilated dwellings – was mirrored by his criticism of the negative impact of industrialization in his native Britain. In *Diet, Dress, and Dwellings of the Chinese In Relation to Health*, he vehemently condemned sanitary conditions and public health in Britain, particularly in industrial cities, claiming that "with all our boasted science and engineering feats, the public health of the large towns is not in a satisfactory condition" (Dudgeon 1884, 440). He used the concept of the "disease of civilization", originally formulated by physicians such as Samuel-Auguste Tissot (1728-1797), to criticize the disruptive lifestyles of the British after the Industrial Revolution (Li 28). These detrimental social customs, a product of their

commercial civilization, had rendered the people's bodies weak, depriving them of their "natural power of endurance and resistance to disease" (Dudgeon 1884, 333).

The Industrial Revolution created huge wealth and power for Britain, but it also had gravely damaging effects on public health, the urban poor, and the environment in Britain. In Dudgeon's native Scotland, between 1801 and 1881, the urban population had risen by 49%. Ayrshire, where Dudgeon grew up, experienced rapid urbanization- especially in the steel industry. Until the late 19th century, mortality rates in Scottish cities were still higher than those of the countryside (Li 30).

Dudgeon complained bitterly about environmental degradation in Britain, where the "sun is not seen more than a few hours per week; and in some cases it is not seen for weeks. On the other hand, the cloudless sky, the pure air, and the constantly dry bracing, invariable atmosphere of the north of China are, as already remarked, all important features in the health of the Chinese and in the prevention of disease" (Dudgeon 1884 411). The smoke in British cities produced fog; Dudgeon blamed the air pollution on the inadequate design of fireplaces and common use of coal in British houses. "The smoke and consequent fogs in winter of our industrial centers are becoming intolerable;" Dudgeon laments, "not only increasing our wash-bill and destroying our fine houses and architecture but poisoning our lives and giving rise to a long train of maladies" (Dudgeon 1884, 411).

He much preferred the Chinese *kang* 炕 stove, a traditionally long platform made of fired clay for general living and working. It had a hollow interior cavity that channeled the hot exhaust from the coal. This stove was embedded in the earth and heated the beds and floors instead. Unlike Western chimneys, the *kang* did not produce noxious smoke, but instead burnt coal balls whose ashes were received in a small pit emptied conveniently when full. The coal the Chinese used was economical as well; they were small pieces of anthracite coal formed in the shape of a ball having been mixed with yellow earth. Such coal was sold at a price a sixth cheaper than pure hard coal, thoroughly burnt for several hours, and emitted great heat (Dudgeon 1884, 408-409). Dudgeon believed that the "plan of heating the bed or floor frees the house from smoke and the 'choking' gas is quite unobjectionable" He also stated that "in China, all ventilation is natural, none artificial" (Dudgeon 1884, 422-423). Therefore, he concluded that diseases such as scrofula, rheumatism, catarrh, chills, bronchitis, and diseases, generally of the respiratory organs and products of vitiated air, were much less common among the Chinese than among Europeans. In the West, deficient ventilation was supposed to be the most fatal of all conditions affecting life. This medical view was not unique to Dudgeon and was shared by other physicians. For instance, Florence Nightingale (1820-1910), a pioneering nurse of the 19th century, advocated the relocation of hospitals to the countryside to avoid the impure air of cities that was allegedly one important cause of hospital infections (Li 31).

Dudgeon concurred with these observers that industrial cities were unhealthy for human dwelling. However, the remedy he proposed was first and foremost personal hygienic discipline. He forcibly claimed: "Such modifications of our habits, modelled after the Chinese plan, is worthy of our consideration. It would increase the joys of life, provided life were confined, as it ought to be, to simple pleasures, temperate habits, modest, becoming apparel, and neat and comfortable dwellings" (Dudgeon 1884, 477).

These recommendations, which emphasize individual behavior over social reforms, bore the distinctive mark of Dudgeon's religious and moral upbringing. Born into the United Presbyterian Church, Dudgeon's family brought him up to live with temperance and frugality. The Calvinist ethics that Dudgeon lived by considered the waste of resources as a rejection of God's divine gifts (Li 30). It was against this backdrop that he praised the Chinese way of life as both beneficial to their bodies and their purses, condemning the luxurious lifestyles of the noble Europeans, and arguing that a life of labor is happier than a life of laziness and luxury. From this perspective, it is unsurprising that for him, the ancient Chinese had many lessons to teach contemporary Europeans regarding lifestyle and health.

For example, Dudgeon disparaged the British people for indulging in depraved activities such as drinking. Dudgeon sarcastically wrote: "I have read of the definition of an Englishman in India as an individual who eats beef, drinks brandy, and has no religion; or as a witty Irish medical man once put it— Europeans come to China, and they eat, and they drink, and they drink, and they eat, and then they die, and afterwards wire home that the climate killed them" (Dudgeon 1877, 36). The pace of modern life made matters worse, as he considered the tendency to use alcohol as a means to relieve stress. He argued that because Europeans consumed too much meat and alcohol, their constitutions were more susceptible to inflammation. The Chinese, on the contrary, had very admirably

adapted to their environment, enjoying maximum amounts of comfort, health, and immunity against diseases pervasive in Britain, despite their supposed ignorance of Western science.

Dudgeon's positive appraisal of the Chinese way to dispose of their cities' waste should also be understood in this light. British philosophers in the mid-19th century stressed the dependence of civilization on the success of agriculture, which in turn depended on restoring to the land the fertilizing elements taken from it. They believed that the optimal sewage treatment technology involved the removal and repurposing of all refuse matter (Hamlin 383). From a theological point of view, the recycling of sewage revealed the providence of God and the goodness of nature. Sewage treatment was not only a way to prevent disease and improve agriculture, it was also endowed with economic, religious and moral meaning. Similar to chemist William Allen Miller (1817-1870), a British critic of sanitary reform, Dudgeon argued that European sewage-treatment measures squandered the wealth of the nation by dumping valuable manure into the oceans and rivers (Li 29).

Dudgeon explains that people in the West are burning away their coal at a fearfully rapid rate, leaving the future to look after itself.

> "After our coal is exhausted, our manufacturing interest, or at least our superiority, will, as far as we can at present see, be at an end, and we shall then be required to go back to grazing and cereal growing, which should never have been abandoned to the extent we have done" (Dudgeon 1884, 415).

Dudgeon even considered the patriarchal system and authoritative culture in China as having a beneficial effect on Chinese health: "The sons with their wives and families all remain under the parental roof. All income goes into the common good, and all expenses are defrayed out of the general purse. There is everywhere the natural and best instincts of human nature, in the desire for posterity" (Dudgeon 1884, 475). This contributed to the healthy "mental repose" of the Chinese, who had "no religious, political, social or philosophical meetings, discussions, newspapers, journals and magazines" (Dudgeon 1884, 474).

In Dudgeon's conservative views, the Chinese had no need for these democratic forums, because such ancient authorities as Confucius and Mencius "had taught all that is necessary for man to know of himself, and to guide him in relations to the family, community, and state" (Li 28). He believed that the Chinese could preserve good health and prevent damage to the body both mentally and physically by avoiding the anger and excitement which came from such debates on controversial religious, political, social or philosophical issues that defined the Western public sphere.

Dudgeon's praise of Chinese practices reflected his criticism of the social, economic and political order in metropolitan Britain, particularly in Scotland during his lifetime. The growth of the steel industry led to rapid population growth, urbanization, environmental deterioration. With overcrowded towns hit by poor hygiene, the people lived a stressful lifestyle with regular epidemic outbursts. Dudgeon's tragic childhood added a personal touch to this medical belief, articulating personal hygienic discipline and public sanitary culture. This experience sharpened his sensitivity to problems of public health throughout his career, while China opened new perspectives to him. He concludes *The Diseases of China: Their Causes, Conditions, and Prevalence, Contrasted With Those of Europe,* with this: "excess is an enemy to nature — moderation in every affection and enjoyment is the way to preserve health" (Dudgeon 1877, 61). His unusually positive views of Chinese hygiene practices and his harsh criticism of modern British lifestyle and industrial civilization constitute two sides of the same coin.

Conclusion

As a rare exception to other medical missionaries, Dudgeon's detailed observations offer a unique alternative perspective of appreciation for non-Western practices. Dudgeon was not the only medical missionary in the 19th and early 20th centuries who had published their research and commentary on health conditions in China and on Chinese culture and society, but unlike many other Western observers who only saw China as a chaotic, squalid place, plagued by superstition and ignorance, unwilling to accept the advances of Western civilization, his attitude toward traditional Chinese hygiene practices was uniquely positive (Rogaski 100). Dudgeon praised Chinese hygiene techniques, as they corroborated his ideals and beliefs. His interests in Chinese lifestyle habits and Tauist medical gymnastics marked him as one of the first Western medical practitioners who audaciously held a positive outlook toward the Chinese approach to living.

His unorthodox medical ideas also reflected his own responses to the social and economic problems in

Britain. Dudgeon's vision of health bore heavy moral implications. For him, problems of hygiene were intimately connected to the problems of social and economic order. At that time, he was preaching in the wilderness, as his publications contradicted the then predominant Western theory of hygiene. But in many ways, we can see him as a precursor of 20th century European medical practitioners who more successfully promoted Eastern, or "alternative" medicines that emphasize prevention and care rather than cure, as opposed to Western biomedicine, which many believe to be impersonally constructed around the needs of the medical-industrial complex (Bivins 36-37).

In March 2017, the National Health Service of Britain published a report called "Next Steps on the NHS Five Year Forward View", which called for the British public health system to shift its emphasis away from treatment and toward the "effectiveness of prevention" (7). Chinese, as well as traditional health practices from other cultures, have much to offer this new endeavor. In this context, Dudgeon's medical thinking, idiosyncratic as it was in the 19th century against the then prevalent scientific racism, deserves our renewed attention today.

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通過清華四大導師看清末民初中國社會的文化思想

朱瀚生

引言

1925 年，清華大學老校長曹雲祥創辦了清華大學國學研究院，先後雇用王國維、梁啟超、陳寅恪、趙元任作為指導學生的教授。清華國學研究院由於種種原因在 4 年後停辦。但在這 4 年間，國學院畢業學生有 50 名後來成為了我國著名的文學家、思想家、革命家。梅貽奇曾評價：「所謂大學者，非謂有大樓之謂也，有大師之謂也。」清華大學國學研究院由於擁有這幾位博學多才的導師，使得清華大學的聲望迅速超越其他院校。四大導師也憑藉著各自的才華與威望，對中國清末民初的社會思想界造成了深遠的影響。在此篇文章中，作者將以管中窺豹、見微知著的方式，通過觀察四大導師的心路歷程，透過社會的冰山一角洞悉探究當時清華大學乃至整個中國的學術氛圍。

圖一： 四大導師雕塑
資料來源：上下藝術：<尋找清華園裡《國學四大導師梁啟超、趙元任、王國維、陳寅恪》的雕塑>，《上下藝術》，2019，wemp.app/posts/2616783f-672d-4e7e-a495-0ec05b7e3ebc，2019 年 9 月 10 日。

一、四大導師不僅在學術上有著非凡的成就，他們處事的思想和探索的精神同樣令人折服

清華的國學四大導師各有自身獨特的思想，我們先從名氣最大的梁啟超說起：

梁啟超，字卓如，號任公，又號飲冰室主人。他是中國近代維新派的領軍人物之一，在康有為的思想影響下，意識到了中國傳統學說的許多缺陷，於是梁啟超開始主張君主立憲，認為中國可以通過制度的西化變得富強。戊戌變法失敗後，梁啟超流亡日本，受到日本著名思想家藤弘之《強權論》的影響。他在 1898 年發表文章《論強權》，提出「我輩人類與動植物同，必非天特與人以自由，平等也。」「世界之中只有強權，別無他力。」[1] 1900 年梁啟超撰寫了激勵著幾代中華兒女的《少年中國說》：「少年智則國智，少年富則國富；少年強則國強，少年獨立則國獨立。壯哉我中國少年，與國無疆！」他看到了官僚階層的腐敗不堪，於是將希望寄託在當時中國青年的身上，鼓勵年輕人打破保守與傳統的觀念，實現改革，振興中華。一戰戰後，梁啟超奔赴歐洲，發現西方社會追求的「民主科學」也存在一些弊端。於是梁啟超開始摸索一條融合中西文化思想優點的發展道路，提出了文化融合論，卻遭到五四運動時期一些激進思想的抨擊。1925 年梁啟超被聘請為清華大學國學研究院的教授，開始注重人格的培養，並將自己的思想傳授給了一批在中國近現代史上地位舉足輕重的思想家。總之，梁啟超的主要思想可以總括為四個字：穩中有進。

This article was written as an essay for a Grade 9 Chinese Humanities class, 2019.

[1] 張娜：〈從社會哲學的角度看梁啟超後期思想之變化〉，中國科學院外國文學研究所，2019，《理論學刊》，第 3 期，103-106，2019，《中國知網》，2019 年 3 月 14 日。

圖二： 清華大學東南門上寫有「自強不息，厚德載物」的字樣資料來源：新浪教育：<你知道清華有幾個校門嗎？>，《清華大學》，2019，edu.sina.com.cn/gaokao/2019-04-17/doc-ihvhiqax3393136.shtml，2019 年 4 月 17 日 10:36。

陳寅恪是中國近現代著名的研究家、語言學家、詩人，被後人譽為「三百年來第一人」。陳寅恪通曉世界各國三十多種語言，在民國初期遠離政壇，潛心研究史學和語言學，卻一直沒有學術頭銜。經梁啟超推薦，陳寅恪於 1926 年回國擔任清華大學國學院的教授，始終支持清華大學一直以來學術與政治分離、兼容並蓄、不依思想排隊的特點，不因親疏有別、充分發揮各位教授特長的觀念。1929 年時任清華大學四大導師之一的王國維過世，陳寅恪在王國維紀念碑銘中提出以「獨立之精神，自由之思想」為追求的學術價值觀，表明了自己不願被捲入政治，希望專心研究學術的觀念。清華大學國學院因導師離世和政治原因於 1929 年停辦，他在《閱報戲作》詩中寫到：「弦箭文章苦未休，權門奔走喘吳牛。自由共道文人筆，最是文人不自由。」道出了陳寅恪本人追求學術獨立和思想自由的心聲。陳寅恪的思想可以總結為「獨立自由」。[2]

王國維，名國楨，字靜安，號觀堂，是清末民初著名的哲學家、思想家、考古學家，被稱一代國學大師。王國維的哲學思想源自西方，吸收了康德、叔本華、尼采、謝林幾位哲學家的哲學思想，並逐步用西方的觀念審視中國的傳統文化。[3] 王國維專注於對生命個體的研究，希望能夠通過對哲學的探索指出當時國民的痼疾所在。他通過復覆的鑽研，提出了著名的「境界論」，指出人成功必經的三大境界：「『昨夜西風凋碧數，獨上高樓，望盡天涯路』，此第一境界也；『衣帶漸寬終不悔，為伊消得人憔悴』，此第二境界也；『眾裏尋他千百度，驀然回首，那人卻在燈火闌珊處』，此第三境界也。」文學方面，王國維曾在《人間詞話》[4] 中指出：「詞以境界為最上。有境界則自成高格，自有名句。」王國維一直以來都非常關心政治，他曾在清朝末年擔任溥儀的老師，並在一戰前醉心研究西學。受俄國十月革命和一戰的影響，王國維開始懷疑西方的體制，也對蘇俄的政治感到不滿，轉而專心探索國學。1925 年，清華大學國學院建成，並擬聘王國維為導師。在清華執教兩年後，王國維離奇地前往頤和園投湖自盡，口袋裡有一封遺書，到目前他的死因還存在無數爭議。王國維的主要思想可以概括為「中西合璧，人格至上」。[5]

趙元任，字宣仲，是中國近現代著名的學者、語言學家、音樂家，被譽為「中國現代語言學之父」，「中國現代音樂學之先驅」。趙先生是一位博學多能的學者，在文科和理科皆有深厚的造詣。與陳、王相同，趙元任也一生都在逃避「當官」，專注研習語言學和音樂，因此趙元任的思想也主要體現在學術方面。趙先生成功地將科學應用到了語言學的研究中，將原本許多模糊的概念變得更加準確、規範。他以科學性質為依據，用定量的數字來使語言更為合理，擴展了這門學科的可探索範圍。[6] 他「融會古今、貫通中外、橫跨文理、精通音樂」(袁毓林《中國現代語言學的開拓和發展—趙元任語言學論文選•前言》)趙元任在 1925 年赴清華大學教授多門課程，他的主要教育理念可以總結為「融會貫通」。

在清華國學院停辦前，四大導師的人生經歷與思想理念有許多相似之處。四人都曾經出國留學，認真探索並分析過中外文化政

[2] 孫敦恆：〈陳寅恪在清華國學研究院〉，1997，《民國春秋》，第 1 期，35-36，1997，《中國知網》，1997 年。

[3] 湛雪瀅：〈王國維哲學思想研究論述〉，華南理工大學馬克思主義學院，2019，《西部學刊》，第 7 期，32-35，2019，《中國知網》，2019 年 7 月 10 日。

[4] 王國維：<卷上>，《人間詞話》，徐調孚校注，一版，香港中和出版有限公司，2017，第 8 頁。

[5] 金滿樓：<王國維：被忽視的天才預言者>，《人民網》，2013，history.people.com.cn/n/2013/0915/c198307-22924766.html，2013 年 9 月 15 日 09:34。

[6] 趙賢德：〈趙元任先生對現代語言科學理論與實踐的探索〉，江蘇理工學院人文社科學院，2018，《江蘇理工學院學報》，第 3 期，12-17，2018，《中國知網》，2018 年。

治，對中國的傳統文化和社會發展前景有所擔憂。正是這樣，四大導師才有了聚首清華的緣分；他們惺惺相惜，成為中國近代史的一段傳奇。

以上是對於四大導師基本思想和個人信息的大致介紹。

二、四大導師在清華大學進行了一次教育體制上的改革，對後世的意義重大

清華學校國學研究院，1925 年春開辦，1929 年夏終止。校長曹雲祥根據胡適的建議，按導師制教學組織方式辦院。清華大學為了聘請四大導師不遺餘力，學者吳宓組織研究院時注重真才實學，不輕信文憑 — 四大導師中三位都沒有博士學位。當時招聘導師的四個標準為：第一，必須對中國文化的全部知識有所了解；第二，必須掌握正確科學的研究方法；第三，必須熟悉歐美、日本學者研究東方學的成果；第四條最特別，也最重要：願意和學員親近、接觸、熱心指導，以便讓學生在最短的時間內學到豐富的知識以及正確的治學方法。最終，梁啟超、王國維、陳寅恪和趙元任這四位通才被邀請到清華擔任導師。

梁啟超在開學典禮上發表著名演講《學問獨立與清華第二期事業》，強調清華「遠採牛津、劍橋之制，近挹中國書院之風」的教育方式。[7] 這種融匯中西的制度推崇學術獨立和思想自由，也保留了中國優異的人文傳統 — 學生需要向導師行拜師禮，但導師必須確保整體地培養學生的學問和人格。這正是印證了清華大學於 1923 年編寫校歌中的兩句話：「立德立言，無問西東。」國學院四大導師識才重才、因材施教、人盡其才，讓學生能夠隨自己的意志充分發揮。梁啟超確立了清華大學的發展方向，表達了「吾儕今努力從事於學問獨立，即為他日一切獨立之準備」的志向。

基於四大導師共同確立的教育觀，王國維主張「善待問者」的理念，展現出了他一直以來被人讚揚的博大胸襟和學術價值觀。不過王靜安先生身上最引人矚目的事件當數他的「昆明湖自」，現代研究者眾說紛紜，提出了「悲觀說」、「為前清殉葬說」、「為文化殉節說」。從這些觀點中，我們可以肯定他的死因多半與民國初年社會思想風氣的變化有關。[8]「悲觀說」即為王國維對中國未來制度的擔憂，是一種對政治氣氛惡化的預感。「為前清殉節說」是一種可能，王國維一生忠於清朝皇室，因此對北京政變與國民黨的北伐感到極其厭惡和恐懼。而「為文化殉節說」就更加耐人尋味了，陳寅恪和吳宓一致認為王國維是自殉於傳統文化，發自於一種對思想不自由、學術不獨立的憂慮。王國維一生「眾裏尋找」的或許就是中國文化的國魂，但當他「驀然回首」，這種文化已經是非主流，被遺棄在「燈火闌珊處」。在民國初年普遍崇尚西學的實用主義浪潮下，王靜安先生的所作所為堅定了一批學子對自身信念和學術獨立的追求，使他們不忘初心。

王國維投湖後，身為清華國學院的另一大導師在《王觀塘先生輓詞並序》中寫到：「.....思想而不自由，毋寧死耳。斯古今仁聖所同殉之精義，夫豈庸鄙之敢望。先生以一死見其獨立自由之意志，非所論於一人之恩怨，一姓之興亡.....」。儘管陳寅恪平日裡與王國維各執己見，經常進行學術爭論，並認為「先生之著述，或有時而不彰；先生之學說，或有時而可商」。但在辦學理念方面，陳寅恪卻一直肯認王國維的「獨立之精神，自由之思想」。作為「教授中的教授」，陳寅恪在亂世當中必然渴望一張平靜的書桌，專心研究古今中外的社會發展。再到後來梁啟超因手術失誤逝世，加上研究院人員的辦學理念逐漸產生分歧，陳寅恪似乎察覺到了一絲不妙。當清華大學正式被民國政府接管後，學校制度發生變化、學術氛圍逐漸收緊，清華國學院的四年歷程於 1929 年正式告以段落。面對時局，陳寅恪不由得感嘆文人是

[7] 沈杰群：《清華國學研究院那四年》，2019，《中國青年報》，第 3 期，2019，《中國知網》，2019 年 5 月 17 日。

[8] 張淑燕：〈國學大師王國維沉湖是為了「殉清」嗎？〉，《人民網》，2011，history.people.com.cn/GB/200623/16742957. html，2011 年 12 月 28 日 15:33。

「《石頭記》中劉姥姥，《水滸傳》裡王婆婆」，終日巴結權貴，毫無自由。陳寅恪作為年輕學者，影響了更多清華人對人文薪火的承續。[9]

圖三： 陳寅恪夫婦墓上寫有「獨立之精神，自由之思想」的字樣資料來源：唐文明：<如何看陳寅恪的「自由之思想」>，《新浪歷史》，2015，history.sina.com.cn/his/zl/2015-05-14/1016120052.shtml，2015年5月14日。

相對於梁啟超的躊躇滿志，王國維的鬱鬱寡歡，陳寅恪的莊素凝重，趙元任則顯得風流倜儻。在當時的清華園中，導師們普遍支持將中國傳統的通儒之學改變為專家之學，推動研究師生迅速走向專業化。由於老輩學者梁啟超、王國維指導的範圍相對廣泛，而青年一輩學者如陳寅恪、趙元任指導範圍較為專一，趙被學生直接選為課題導師的次數較少。加上梁、王執教的內容植根於舊學基礎之上，易於學生理解和接受，趙、陳執教的學科起初被冷落。再到後來學生們逐漸融入五四以後的新歷史考證學派，趙元任的西學開始逐步發揮潛移默化的影響。趙元任在清華大學任教時不像梁、王那樣繁忙，因此自身擁有充裕的時間用於研究學術。趙元任就像一個亂世中的隱士，在那個駁雜紛繁的時代中不受干擾，促進了五四運動舊學到新學的平穩過渡，激勵著一代青年置身於學術研究當中。

20 年代中期，在近代學科體制的衝擊下，傳統的中國「國學」已經是非主流。一批大師意識到傳統文化的危機，就引領了一波考究舊學以及學術獨立的思潮，並試圖通過創辦國學研究院的方式來探索「國魂」。[10] 清華的四大導師中的三位沒有大學文憑，卻依舊作為大師被名校聘請，這正是一種對僵化教學體制的抗爭。國學院創辦時希望在接受西方思想自由的同時，把中國的「大學之道」灌輸進去，採取統包性的專題研究型態。由於軍閥混戰，研究院的師生們經歷了一段較為自由的時光，在學術方面也卓有成效。然而好景不長，當張作霖以政治原因處死李大釗後，京城的學人們感到危險就在眼前。山雨欲來風滿樓，不久北平《世界日報》晚刊上發表了一篇《戲擬黨軍到北京所捕之人》的文章，梁、王等人都感到極度不安。清華國學院停辦的原因不僅在於王、梁二人的凋零，同時受到當時政治和學術風氣的影響。從表面上看，清華國學研究院的消亡似乎是一例個案，其地位的特殊不足以反映整個時代的思想潮流。但是我們如果從學術體制的角度來看，清華國學院的創立與消亡十分典型地反映了傳統學術在近代學科過程中所面臨的掙扎。隨著國學院落下帷幕，四大導師的治學理想也宣告破滅。儘管如此，大師們的一輪挫折為後世積淀了珍貴的經驗，對中國文史研究的現代化做出了巨大貢獻。

三、新文化運動時期，部分文人思想極為激進，希望中華文化可以在一夜之間轉變為外國的現代文化。作為學術界的名流，四大導師自然不可能置身於事外。他們通過自身極大的影響力有效地緩和了社會上的思潮，促使人們理性探索發展道路，避免適得其反

五四運動前後，一批受西方文化影響的學者們發起了一次「反傳統、反孔教、反文言」的思想文化革新運動。出於一種對「全盤西化，喪失國魂」的擔憂，一批看到西方體制弊端的學者決定嘗試取其精華、取其糟粕。清華四大導師於上世紀 20 年代中後期執教於旨在協調東西教學，融匯中外之制的清華國學研究院，並在當時的學術界引發了極大的反響。

學術層面上，四大導師取法歐美，提倡在西方漢學擅長的領域從事專題研究。相較於中國傳統的整體式教育法，專題演習則更

[9] 溪水西流：〈從學問獨立到精神獨立—讀《清華大學王觀堂先生紀念碑銘》後〉，《搜狐網》，2009，sinodyssey.blog.sohu.com/136891524.html，2009年11月15日 23:52。

[10] 朱洪斌：〈清華國學研究院的學術建置及治學精神〉，《中國社會科學網》，第3期，2014，www.cssn.cn/st/st_xsplc/201403/t20140325_1042137.shtml?COLLCC=1806635259&COLLCC=1403982075&COLLCC=1806635259&COLLCC=1454313723&COLLCC=1403982075&COLLCC=1806635259&，2014年3月25日 15:08。

加有針對性。這種在教育方式上的改革，引領了當時中國的分科潮流。同時，四位大師捍衛了中國傳統的書院風氣 — 學生尊師重教、敢於發問，導師因材施教、注重品德。這在一定程度上緩和了新文化運動時人們對孔子學說和傳統文化的抨擊，提升了知識份子們對傳統文化精華部分的信任。

民族層面上，中國當時的文史學界正在進行一場名為「把漢學中心奪回中國」的運動。這場運動之中，四大導師在現代學術研究機構裡培養新人，卓有成效地提高了中國學術研究的水平。在國學院的助力下，清華大學一躍成為全國的一大名校，其他院校紛紛效仿，創建國學研究院。短短 4 年間，國學院有 50 余人成為我國人文學界知名學者，在一定程度上程度上左右了史學界。由此可見，四大導師為我國文化地位的提升做出了巨大貢獻。

綜上所述，梁、王、陳、趙有在學術方面的影響，更有民族方面的影響。四大導師影響並引領了教學「過渡時代」的思潮，是文史學平穩過渡的壓艙石。

結論

歸根結底，清華國學院的四大導師不僅學識淵博、通曉古今中外，還敢於對教育界的體制發起挑戰、進行改革。他們在治學過程中試圖達成的中西合璧是所有智者的真實願望。他們對獨立精神與自由思想的追求同樣令後世學者望其項背。引用著名作家查爾斯·狄更斯的一句話：「這是最好的年代，也是最壞的年代」。無論是學問獨立還是中西融合，都基於那代學人身處的動盪時代，源於他們對歷史和時局的洞悉與把握。四大導師對於當時社會不但有舉足輕重的學術貢獻，更是充當了指路人的角色，在精神層面上支持著無數學者。當史學家們研究這四位偉人時，也總會懷念清華國學院那四年的學術氣息與文化氛圍。

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Medical Advancements and Sociological Behaviours in Ancient China:
How did the Role of Women in the Tang Dynasty affect the Gynecology and Obstetrics Prescriptions Formulated by Sun Simiao?

Valerie M. Stacey

Introduction

For thousands of years, Chinese medicine has been used to prevent and cure diseases. Constantly evolving and ever changing, medicine has changed the lives of many Chinese people. Physicians have spent years honing their craft and deepening their understanding of this sophisticated field. Chinese medicine encompasses key philosophical and cultural values of China, forming an intricate mosaic of knowledge and traditional wisdom. This essay will analyse the social status of women in Tang 唐 China and how this may have affected the Chinese medicine of the time, specifically the prescriptions concocted by Sun Simiao 孫思邈, one of the most famous and well-versed physicians of his age.

1. Literature Review

In the modern age, historians and scholars have studied concepts regarding Chinese medicine for women in Imperial China, along with the specifics of ingredients used in medicinal and pharmacological cures. At a certain point, these topics overlap with the study of women's roles in the Tang Dynasty. *A Flourishing Yin: Gender in China's Medical History* by Charlotte Furth and *Medicine for Women in Imperial China* by Angela Ki Che Leung include a detailed analysis of the physiology of pregnancy and childbirth, along with the rituals and medical procedures associated with this. Alexis Rapozo wrote the thesis, *Life in a Golden Age: The Status of Women in China's Tang Dynasty* about the roles of women in Tang society, and the importance of motherhood to their prominence in the community. Here, she argued that 'The role of motherhood is significant in not only defining the status of women, but their influence as well' (Rapozo 9). In *Modern Research and Application of Chinese Medicinal Plants* written by Changxiao Liu, Peigen Xiao and Dapeng Li, research shows the function of different ingredients used in herbal concoctions, in addition to the way that they were used traditionally.

The most noteworthy resource is a primary source written by Sun Simiao himself, which was later edited and translated by Sabine Wilms, *Qianjin Yaofang* 千金要方 [*Essential Prescriptions Worth a Thousand in Gold for Every Emergency*]. This book is a collection of thousands of Sun Simiao's personal prescriptions, written for his patients. Of the 30 volumes written by Sun himself, Wilms translated three, written specifically for women and their ailments. Wilms wrote a preface, which is an analysis of Sun Simiao's life and work. She provids a thorough synthesis of Sun Simiao, his recipes and intentions, along with his views of women.

2. Sun Simiao and His Influence

Sun Simiao was a very famous doctor who lived between the Sui 隋 (581-618) and Tang Dynasties (618-907). Legend went that because of his lifestyle, he was able to live for between 100 and 150 years. His birth date and death date are often disputed by historians. Very little is known about his life, but it is known that he was a Taoist Priest and part of the Emperor's retinue, meaning he advised and helped the emperor (Sun 12). Sun Simiao is probably best known for his book *Qianjin Yaofang*. Here, he compiled thousands of his prescriptions for all types of diseases and ailments to spread his knowledge for the benefit of common people. This book was again made famous in the Song 宋 Dynasty (960-1279), with 500 of the most useful concoctions being transcribed onto stone tablets (Sun 13).

Sun Simiao's longevity, if historically true, implies that he lived a very healthy life, in both a physical and psychological sense. Although Sun was part of the

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Emperor's retinue, he would often shy away from politics and corruption, repeatedly retreating to Mount Tai Bo to rest his mind and soul. He was not only accomplished in the medical field, but was also known to be versatile, and showed proficiency in mathematics, astrology and natural philosophy (Sun 15).

Legend has it that Sun Simiao was a very sought-after physician, held in high regard by many officials and aristocrats. He also changed the fields of gynecology and obstetrics with his personalized prescriptions. His understanding of women and their bodies was remarkably comprehensive even by today's standards, and showcased his aptitude as a healer. He was said to have worked magic, and seemed to have an innate and deep-rooted grasp of the human body and its functions (Sun 14).

Sun Simiao's influence did not end when he passed away, his work can still be seen in modern recipes and prescriptions. Although the recipes have evolved slightly over the centuries, the major ingredients seem to have stayed the same. It is clear that many of the prescriptions used today are derived from the ones created by Sun Simiao hundreds of years ago.

The accounts of Sun Simiao's life seem to create more questions than answers, but his accomplishments speak for themselves. His books live on to extend his legacy and showcase the prescriptions that helped change the lives of many. His unique idea of the female body helped build the foundations for modern forms of Chinese medicine.

3. Women in the Tang Dynasty

In Imperial China, women were traditionally perceived as much weaker when compared to men, and held much less power. However, the Tang Dynasty was more open in this sense, producing the famous empress Wu Zetian 武則天 (624-704) (Rapozo 5). Women had the role in society as daughters and mothers. Wifedom and motherhood were integral to the lives of most women. Despite generally still being subordinate to men, Tang Dynasty women held high levels of power in their households due to Taoist and Buddhist ideologies. Although the Tang Dynasty has long been considered a time of opulence and wealth (Rapozo 11), there are accounts showing that different women were treated differently, and had varying levels of power.

Evidence suggests that due to the open-mindedness of this period, some women had roles other than motherhood in society, including some that did not necessarily align with Confucian values. Some of these roles would include concubines and entertainers. Female entertainers were popular during the Tang Dynasty, and these businesses thrived in Chang'an (Rapozo 15). These women were trained in drinking-games, poetry recitation and dancing. Entertainers could work for private businesses or for the court. However, neither of these positions allowed for much freedom. Entertainers were considered low-status women, and their number usually consisted of women attempting to escape a poverty-stricken upbringing. Some women who happened to be Buddhist or Taoist became nuns and avoided unwanted marriage and motherhood by focusing on their spiritual goals. These unconventional ways of life were not common, and many women opted to remain in a traditional and more family-oriented role, where they focused on procreation.

Religious faith was an important part of the identity of many Tang women. Buddhism and Taoism spread rapidly due to imperial support, and this guided many women's actions and conduct. On the other hand, aristocratic women, who adhered to Confucian values and honor their families as mothers, daughters, and spouses were also able to exert high levels of political influence (Rapozo 16).

The motherly role that many women adopted was not only significant in defining the status of women, but also in helping shape the lives of their offspring. Tang mothers were portrayed as moral advisors, learned teachers, spiritual counselors and even a child's own conscience. Mothers were instructors to their children, and their ability to perform this job would affect their position in society (Rapozo 10).

Most of the families in Tang China were polygamous, with one wife and multiple concubines. Therefore, concubines represented a second growing industry, and many women became concubines to wealthy men. Concubines' statuses were lower than the main wives', even the law supported this, stripping them of certain rights (Rapozo 14).

4. Pregnancy and Childbirth

Procreation played an integral role in the lives of women, and due to the lack of medical knowledge during the era, could be a matter of life and death. When a birth was successful, it was a reason for celebration as well as confirmation of the abilities of those who helped to deliver the child. If only the mother was killed, then the household might have lost an important figure in the family. If the mother

survived and the child was stillborn, it was considered a failure on the mother's part. However, if both passed away, it was usually blamed on those who helped the mother to give birth, and the entire family and community would mourn (Lee 109). Therefore, giving birth was an important event, and excessive amounts of time and money were spent to preserve the lives of both the mother and the fetus.

Pregnancy was believed to be caused by the stimulation of *yin* 陰 and *yang* 陽 between men and women. The *yin* and *yang* are important concepts in Chinese medicine, representing masculinity and femininity. They are also metaphysically grounded with connections to social patterns and Chinese cosmology. According to traditional Chinese understanding, pregnancy is assisted by the woman's kidney, and occurs when a transformation starts in the uterus, and this transformation process is how the baby is conceived. The highway channels and conception channels are seen in their governance of females and their fertility. Menstruation was supposedly caused by the woman's *yin* and *yang* floating upwards and spilling over, and showed the point at which women were able to biologically start giving birth to children. However, Sun Simiao stated that the female body was more susceptible to diseases and illness after giving birth, and doing so too many times could cause long term problems (Sun 18) .

Medical procedures did not simply include ingested prescriptions, but also certain *fengshui* 風水 practices such as facing certain directions when giving birth. Most historical evidence gathered by modern researchers about this topic has been about well-off women, and many of these plans do not seem to apply to the less well-off. A birthing tent was set up outside the living quarters, and this was where the woman was to give birth. This tent was to be placed according to *fengshui* principles, and there were birthing charts to provide guidance in this respect (Figure 1). The birthing quarters were placed based on the time of year. However, some of the rules regarding birthing quarters were so complex that women did not bother to follow them. They had to follow additional auspicious rules so that the birth could be as smooth and successful as possible, such as the technique that they would use to squat during the birth. The place the tent was erected had to be free from fresh cut wheat stalks, tall trees and other inauspicious substances (Furth 67). Sun Simiao was known to value these *fengshui* practices, especially when creating prescriptions for women (Sun 17). His views on women helped shape his prescriptions and widespread medicinal views on pregnancy and childbirth, in turn.

5. Sun Simiao's View of Women and Women's Diseases

Sun Simiao has said that "Women's diseases are ten times more difficult to treat than men's" due to them having to deal with pregnancy, childbirth and menstruation (Sun 15). Sun Simiao's recognition of women's diseases and vulnerabilities illustrates the importance of women in Tang society. He interpreted women as the foundation and creators of life, putting the volumes on women's diseases at the beginning of his book (Sun 16). Both the abundance of prescriptions and the work put into the volume shows his genuine care for women and their ability to help continue the family lineage.

Sun Simiao focused on the reproductive system, as well as on issues regarding pregnancy and childbirth. He aimed to preserve and prolong the lives of women through his prescriptions. He seemed to believe that in order to perpetuate the lineage of the family, he would need to nurture the lives of the living by improving the wellbeing and lifestyles of the women, rather than focusing on the survival of the children. He seemed to be intent on enriching the lives of women and helping them prevent diseases, as opposed to simply curing them when they came along.

There were many different diseases and ailments that women had to deal with. These were divided into different categories in Sun's book, with the biggest one being pregnancy and childbirth. There were many different types of pregnancy and childbirth complications that women often had to deal with. The first issue that a vast number of women had to deal with was infertility. This, according to Sun, could be caused by more physical issues such as the blockage of the uterus caused by cold blood or malignant substances. There were also spiritual problems that were blamed for these complications such as the woman's astrological sign not being compatible with her partner's, or the family not following traditions of filial piety (Sun 28).

Pregnancy complications were also common amongst women, including miscarriage and fetal illness. Herbal medications were prescribed to the women for every month of her pregnancy in order to prevent fetal illness within the womb. Postpartum issues were also widespread. Wind strikes after childbirth could be deadly, and could cause seizure-like symptoms (Leung 160). Cold damage and headaches also occurred, which is why many women were monitored for a period after their pregnancy to help detect issues such as these.

Women might also have complications with menstruation and during menopause such as menstrual stoppage, vaginal discharge and menstrual irregularities (Xia *et al.* 52). Other miscellaneous issues were also treated, including *qi* 氣 diseases, blood diseases and genital diseases. All these issues were unique to women, and each woman had a different experience with them: therefore, prescriptions had to be personalized to fit each patient's particular constitution (Sun 36).

6. Sun Simiao's Prescriptions for Women

Sun Simiao attempted to extend the lives of women by advising their diets, lifestyle, *qi* cultivation and sexual cultivation, along with more technical advice via pulse diagnosis and acumoxa therapy. He had different types of preferred prescriptions including herbal concoctions, acupuncture, moxibustion and rituals. Sun Simiao valued certain treatments over others. He held life-prolonging drugs to high regard, followed by drugs for supplementing vacuity, then by drugs for expelling evil (Sun 34). This showed that he liked to ward off potential illnesses, as opposed to dealing with the disease when it is already present.

For diseases connected to reproduction, Sun Simiao had a wide variety of prescriptions that he would dole out. These would include acupuncture, moxibustion, orally ingested herbal concoctions, suppositories and other non-herbal medications. To ease pregnancy, Sun Simiao prescribed medication to women by the month, ending with drugs to help ease the childbirth process (Sun 29). Some of the acumoxa points for pregnant women can be seen in Figure 2, and these are still used in the modern era for the same purposes.

Sun Simiao believed in 'fetal education', or the manipulation of a baby's gender, usually from female to male. In that day and age, it was thought that the baby would not be assigned a gender until three months into the pregnancy. He defined a pregnant woman's ideal surroundings, prescribed activities such as reciting poems to maintain a composed mindset. He also asked the woman to complete certain rituals, including taking a crossbow string and placing it in a crimson bag that she would carry around on her left arm (Sun 46). The color red was often connected to good luck and auspiciousness. Another one of these processes would include the pregnant woman sleeping with an axe under her bed. Most of the objects used in these rituals such as crossbows and axes were more masculine, as it would match the purpose of the ritual, which was turning the fetus into a male. Fetal manipulation played a part in the culture of the time and revealed a certain misogyny of the time.

The ingredients Sun Sumiao used in his recipes were carefully selected. They had their own importance to the Chinese medicine processes and were significant in their own ways. Some were based on analogical thinking, whilst others were linked to ritualistic traditions. Some of these ingredients would be considered strange by modern standards, but can be made sense of within the framework of traditional Chinese medicine.

One type of ingredient represents femininity and the intrinsic bond between a mother and child. For instance, infant urine was used to cure certain pregnancy complications (Sun 31). Although this can be scientifically backed today on the basis of urea consumption for health reasons, the reason Tang physicians used it to treat pregnant women is largely symbolic. Sun Simiao obviously believed in treatment by sympathetic force based on the deep connection, even a unique bond between a mother and child, where a child's urine can pass his vital energy to the mother, strengthening her health. Some other similar ingredients would include ingesting nails and matted hair (Sun 31). During the Tang Dynasty, hair and nails were often used to highlight a woman's femininity. Therefore, we believe that these ingredients were meant to accentuate womanhood, allowing women to heal and better themselves.

An additional way that Sun Simiao chose ingredients for his prescriptions was based on their names. An example is the bug *shufu* 鼠婦, used to treat the retention of urine and blocked menses (Leung 34). This pillbug was a common ingredient in Chinese pharmacopeia, and was extremely prevalent in medicine for women. The name *shufu* literally means 'rat woman' or 'rat wife'. Since the word 'woman' was incorporated into the name, many traditional physicians included this ingredient into their recipes. The word *fu* 婦 also means 'wife', which was one of the most important roles of Tang women. This ingredient was one of the cases in which the name of the substance played a part in its role as part of a prescription.

Many other ingredients that were initially used by Sun Simiao are still used today. An example of this is seen in the Pinellia 半夏 and Poria 茯苓 decoction used to ease morning sickness (Sun 92-93). As seen in Table 1, the three main ingredients - poria, pinellia and ginger, are still used in the recipe today (Hsü and Easer 34).

As seen above, a number of the ingredients chosen by Sun Simiao to be put into recipes were based on women and their perceived role in society during the 7th century. There were also ingredients chosen for more mystical and metaphorical reasons. Each ingredient had its own importance and connotation in the context of Chinese medicine, as well as Chinese philosophy and history at large.

In the future, other parts of Chinese culture could be researched in conjunction with Chinese medicine and its purpose. For example, it may be advantageous to look into the parallels between Chinese medicine and supernatural beliefs. The information gathered throughout the research process suggests that beliefs in the supernatural were a common part of traditional healing; they could be a potential research topic in the future. This could also lead us to investigate Chinese cosmology and its impact on medicine, the link between which has been clearly shown in this research. Delving deeper into these topics might in turn broaden knowledge and understanding on multiple fronts.

Conclusion

Based on the research conducted, it can be concluded that the role of women as mothers and women's potential to procreate affected the prescriptions devised by Sun Simiao to a great extent. The role of women as mothers affected not only the purpose of the recipes, but also the ingredients incorporated into them. Pregnancy and childbirth were not only physical aspects of a woman's life, but also contained a major social dimension: over 40% of the sections that Sun Simiao wrote for women were about pregnancy, with an additional 20% of them about menstruation and complications associated with it.

Women's roles as mothers helped to determine the sheer number of prescriptions that Sun Simiao wrote about childbirth, along with certain ingredients such as *shufu*, nails and infant's urine. Each of these ingredients has a slightly different significance, some based on their names, others based on their connection with children. Chinese medicine is embedded in a complex cosmology, teeming with abstract concepts and entangled with religions. Each detail was therefore significant in the context that they were placed in.

Ultimately, Sun Simiao's gynecological recipes illustrate the life advantages and disadvantages of woman's life in the Tang Dynasty. Women's suffering regarding childbirth and menstruation were recognised widely, and attempts were made to reduce these issues and make these processes more bearable for women. Physicians such as Sun Simiao concocted complex recipes in order to minimise their hardship, increase fertility and reduce pain (Sun 20). However, there are many other social struggles that women faced during this period. Women were seemingly constrained by the idea of their futures as mothers, and their role in society was often limited to motherhood. Women rarely took charge of familial finances, and were often shunned if they did so. Many often opted to stay at home and out of the limelight (Rapozo 16). Many women escaped the constraints of the family by becoming professional entertainers or nuns, but interestingly, these women are very underrepresented in Sun Simiao's recipes. The Tang Dynasty allowed women a considerable degree of freedom, respect and comfort, and in turn, they were expected to conform to certain societal expectations and motherhood.

Pinellia and Poria Decoction Ingredients

Sun Simiao	Modern
Poria 茯苓	**Poria**
Pinellia 半夏	**Pinellia**
Ginger 生薑	**Ginger**
Glutinosa 赤揚	
Citrus 柑橘	
Albiflora 陰山薺	
Britannica 旋覆花	
Wallichi 多星韭	
Jasmine 素馨花	
Uralensis 甘草	
Dandelion 蒲公英	

Table 1. This table shows the similarities and differences between Sun Simiao's prescriptions and prescriptions used today. Three main ingredients - poria, pinellia and ginger are bolded, and shown to be present in both recipes.

Traditional Chinese Birthing Charts

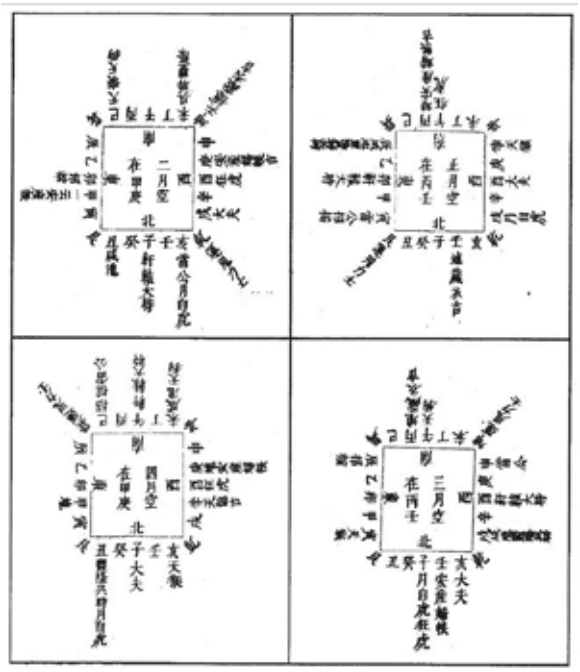

Figure 1. These images show examples of birthing charts used to determine the directions for mothers to give birth in imperial China. Women would follow these directions in hopes of having a painless and complications-free birthing experience.

Traditional Chinese Birthing Charts

Figure 2. This is an example of the acupuncture and moxibustion points that Sun Simiao prescribed to his pregnant patients.

Glossary of Chinese Medical Terms

Terms	Explanation
Acumoxa 針灸	Treatments that incorporate acupuncture and moxibustion
Acupuncture 針刺	A system of complementary medicine in which fine needles are inserted into the skin at specific points
Cold Damage 傷寒	Cold is a Yin pathogenic factor and causes sudden onset of symptoms of chilliness, headache, and body aches
Fengshui 風水	A system of laws considered to govern spatial arrangement and orientation in relation to the flow of energy
Moxibustion 艾灸	The burning of moxa on or near a person's skin as a counterirritant
Pulse Diagnosis 脈診	Pulse diagnosis is a diagnostic technique used to determine the health conditions and course of treatment for patients
Qi 氣	The circulating life force whose existence and properties are the basis of much Chinese philosophy and medicine
Shufu 鼠婦	A type of pill bug used in traditional Chinese pharmacopoeia
Vacuity 內虛	Lack of thought or intelligence; empty headedness
Wind Strike 中風	Wind is one of the six external factors of disease. These climates can attack the body, enter the meridians, and cause external diseases, for example, cold wind can cause colds
Yin Yang 陰陽	The ubiquitous yin-yang symbol holds its roots in Taoism/Daoism, a Chinese religion and philosophy

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Why did Atomism arise in Ancient Greece and not in Ancient China?

Vanessa Chun Sze Wong

Introduction

Atomism is the fundamental theory that all matter is composed of small, indivisible, inalterable parts called atoms, unseeable to the eye. The theory arose independently in both ancient Greece and India. However, despite seeming to be a theory which "could be expected to arise in all civilisations independently", as Needham once wrote (Needham 3-6), atomism was never formally theorized in ancient China. This is surprising, as Chinese philosophers had been pursuing similar lines of inquiry relating to infinite divisibility and postulating similar elemental theories as the Greeks. Therefore, this paper aims to investigate why Chinese philosophers did not develop a theory of atomism.

The answer to this question hinges largely on how each tradition viewed the concept of change while Greek philosophers found this notion to be problematic, the theory of *yin* 陰 and *yang* 陽 in ancient China meant no such problems were apparent. Change was viewed by ancient Chinese philosophers as a natural, constant, and unavoidable fact of life, and therefore they did not feel particularly compelled to scrutinize the mechanisms behind it. Furthermore, ancient Chinese philosophers considered change merely as the same object's realisation of its inherent tendencies, and therefore they would not have run into the issue of something coming into existence from nothing, which was problematic for the Greeks. As a result, since the concept of change was not found to be philosophically problematic in ancient Chinese thought, atomism was never formally developed, since there was no perceived intellectual need for it.

1. Conceptual Prerequisites of Atomism in Greece and China

Ancient texts affirm that both ancient Chinese and Greek philosophers had independently identified key problems with the nature of things, namely, the problem of infinite divisibility and the concepts of the very big and very small.

1.1 Infinite Divisibility

The notion of infinite divisibility is problematic as it raises several paradoxes. If infinite divisibility is allowed, anything could be continuously divided until it's so small it's reduced to nothing. The problem with this is that then an object could arise from nothing and exist as a composite of nothing, which is not possible. Alternatively, the divided parts would eventually become so small that they would essentially be geometrical points with no magnitude. This second possibility suggests that a conglomeration of geometrical points lacking magnitude could eventually result in mass and magnitude, which is again impossible and contradictory to the very definition of a geometric point. These problems of infinite divisibility had been recognised and contended with by both ancient Chinese and Greek philosophers as outlined below, particularly in the form of paradoxes.

The Chinese paradoxes were mainly posed by philosophers in the School of Names. The *Zhuangzi* 莊子 was the most notable of these texts, attributed to Zhuang Zhou 莊周 (also commonly known as *Zhuang Zi* 莊子, literally "Master Zhuang") in addition to other philosophers during the late Warring States period [戰國中期] (c. 3rd century BC), and is one of the foundational texts of Taoism. As for the Greek paradoxes, they were most notably considered by the pre-Socratic philosopher, Zeno of Elea, and later recorded in Aristotle's *Physics*.

Paradoxes in the *Zhuangzi* have surprisingly similar counterparts in Zeno's paradoxes as outlined in Aristotle's *Physics*. For example, Zeno's dichotomy paradox:

> Πρῶτος μὲν ὁ περὶ τοῦ μὴ κινεῖσθαι διὰ τὸ πρότερον εἰς τὸ ἥμισυ δεῖν ἀφικέσθαι τὸ φερόμενον ἢ πρός τὸ τέλος

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> That which is in locomotion must arrive at the half-way stage before it arrives at the goal, and the halfway stage of what is left, and so on, and therefore will never reach any given point
> (*Arist. Ph* VI:9, 239b10)

is comparable to a paradox posed by another philosopher Hui Shi 惠施, recorded in the *Zhuangzi* :

> 一尺之捶，日取其半，萬世不竭。
>
> If from a stick a foot long you every day take the half of it, in a myriad ages it will not be exhausted
> (莊子 *Zhuangzi* - 天下 [*Tianxin*])
> (93/33/78 [Legge Trans.])

Both paradoxes deal with bisection and argue against the infinite divisibility of distance and a physical object; just as that which is in motion can never pass an infinite number of halfway stages, the finite stick will never be exhausted and can always be cut further. Since empirical evidence proves that these two conclusions are in fact untrue, these paradoxes elucidate the problems with infinite divisibility. After atomism had been devised, Aristotle said that atoms were postulated specifically to resolve Zeno's dichotomy paradox, by setting a minimum boundary on what can be measured thereby refuting the possibility of infinite divisibility. Similarly, atoms, being indivisible, would negate Hui Shi's 惠施 paradox by limiting the smallest division to the size of an atom.

Another pair of parallel paradoxes concerns the flight of an arrow. Zeno posits,

> Εἰ γὰρ ἀεί, φησίν, ἠρεμεῖ πᾶν ὅταν ἧ κατὰ τὸ ἴσον, ἔστι δ' ἀεὶ τὸ φερόμενον ἐν τῷ νῦν, ἀκίνητον τὴν φερομένην εἶναι οἰστόν.
>
> If everything when it occupies an equal space is at rest, and if that which is in locomotion is always occupying such a space at any moment, the flying arrow is therefore motionless
> (*Arist. Ph*. VI:9, 239b5)

Within the *Zhuangzi* we find a comparable paradox:

> 鏃矢之疾，而有不行不止之時。
>
> Swift as the arrow is, there is a time when it neither travels nor is at rest.
> (莊子 *Zhuangzi* - 天下 [*Tianxin*])
> (93/33/77)

These two almost identical paradoxes stem from the idea that time is composed of durationless instants in which a flying arrow would be motionless, occupying an equal space. However, if time consists only of instants in which the arrow is at rest, the arrow cannot move. Thus, these two paradoxes argue against the conception of time and space as being discrete, therefore presenting an objection to an atomic conception of space and time that was established in the previous paradoxes. It is, furthermore, inconsistent with an atomistic view in which motion is thought to be continuous and infinitely divisible. However, it is still possible to resolve this paradox within the framework of atomism by presuming motion to not be continuous, but to also occur in discrete parts. In this way, not only are time and space seen from an atomistic point of view, but motion, too, can be analysed as comprising discrete parts, with the arrow in one position in one instant and then in another position in another instant (Kenyon).

1.2 The Very Big and Very Small

Besides the problems with infinite divisibility, other preconceptual prerequisites of atomists were also already established in Ancient China, as seen in the investigation of the minisculely small.

Within the *Zhuangzi* , the concept of a geometrical point was theorised as:

> 無厚不可積也，其大千里。
>
> That which has no thickness, cannot be accumulated, but is a thousand miles large,
> (莊子 - 天下 [*Tianxin*])
> (93/33/71 [Reding Trans.])

Furthermore, the *Liji* 禮記 [*The Book of Rites*] spoke of minute, indivisible entities:

> 語小，天下莫能破焉 。
>
> Were he to speak of it in its minuteness,] nothing in the world would be found able to split it.
> (禮記 *Liji* - 中庸 *Zhong Yong*
> *(Doctrine of the Mean* [Legge Trans.])

Both texts' ideas of extremely small parts are in line with the fundamentals of atomism. They were also able to explore the distinction and the relationship between the concept of infinitely big and infinitely small, such as in the *Zhuangzi*:

至大無外，謂之大一；至小無內，謂之小一。

That which is so great that there is nothing outside, call it the Great One. That which is so small that there is nothing inside, call it the Small One.

(莊子 - 天下 [*Tianxin*])
(93/33/70-71 [Legge Trans.])

Throughout ancient texts there are also examples in which the accumulation of small objects leads to a large result, such as where

故積土而為山，積水而為海。

The accumulation of earth results in a mountain, the accumulation of water is the sea.

(荀子 *Xunzi* - 儒效 *Ruxiao* 25/8/111)
["On Achievements of the Ru"]

or in the *Shiji* 史記 [*Records of the Grand Historian*] where

故《易》曰「失之豪釐，差以千里」。

A deviation of as slight as an autumn spikelet causes an error of a thousand miles.

(史記 *Shiji*)

These two notions are similar to the idea posed in Zeno's paradox of the Grain of Millet, with the argument that "a single grain of millet makes no sound upon falling, but a thousand grains make a sound. Hence a thousand nothings become something" (Proudfoot and Lacey 445). All such notions of the accumulation of much smaller objects resulting in something much larger is also the conceptual reasoning behind atomism.

Therefore, the notions of smallest parts and the accumulation of the small into large prove that the foundations of atomism were present in ancient Chinese philosophy. This fact, combined with the similarities between the aforementioned paradoxes of infinite divisibility, makes it all the more surprising that atomism did not develop in Chinese philosophical thought and suggests that other factors were at play, hampering its development.

2. Atomism in Ancient Greece in Response to the Problem of Change

2.1 The Problem of Change

The Eleatic problem of change was first posed by Parmenides in the 5th century B.C. Parmenides made a distinction between what is and what is not, and established that "what is" is permanent, enduring, and indestructible:

That what-is is ungenerated and imperishable,
whole, uniform, unmoving, and without end,
Neither was it nor will it be, but rather it is now,
altogether one, continuous

(*Parm. frag.* 8, line 3-5)
[Smith Trans.]

He also stated that "what is" could never turn into what is not and vice versa, even in the future or past, for each forever is or isn't.

It is or it is not; and it has been judged, as is necessary,
To eschew one as unthinkable and nameless (for it is not
A true way), and the other as being fully real and true.

(*Parm. frag.* 8, line 16-18)
[Smith Trans.]

That "what is" is permanent is determined on the basis that something cannot come out of nothing, and therefore must have already existed, for otherwise there is no explanation for its coming-into-being. It could not have come from what is not, because what is not can only ever be "what is" not, and "what is" cannot perish later on, for then "what is" would have become "what is" not, which is again impossible. There is also no external reason why something created out of nothing would be created later or sooner, and therefore it must either be "what is" or "what is" not permanently:

For what coming into being will you seek of it?
How and from what did it grow? Nor will I permit you to say
Or to think, "from what-is-not," for it is not possible to say or think that it is not
For need would have urged it
Later or sooner, starting from what-is-not, to grow?
Thus it must either be or not-be.

(*Parm. frag.* 8, line 6-11)
[Smith Trans])

Furthermore, having established that the perishing and coming-into-being of "what is" is not possible, Parmenides derives that "what is" is therefore changeless and unalterable, since "what is" must remain in the same state as it has always been. Nothing more can be added, nothing less can be taken away:

> Moreover, changeless within the limits of great bonds,
> It is without beginning and without end, since coming-into-being and perishing
> Have driven far away, banished by genuine conviction.
> And the same thing, remaining in the same state, it lies by itself.
>
> (*Parm. frag.* 8, line 26-29)
> [Smith Trans.]

In this sense, Parmenides considers change to be impossible, as that would involve something ("what is") coming into existence from nothing ("what is not"), moving from non-existence to existence, or vice versa. From his fragments, it can be reasoned that he viewed change as the disappearance of some part of the original and the appearance of the new result out of nowhere, contradictory to the principle that something could not come into being out of nothing. For example, when a chameleon changes from red to blue, it would be interpreted as the perishing of the blue chameleon and the coming to be of a red chameleon (Warren), or when baking a cake, the disappearance of the raw ingredients and the appearance of a baked cake.

To that effect, Parmenides claims that change is merely an illusion, a trick of the viewer's perception:

> Thus, all that mortals have proposed are names convinced that they are true;
> To come-into-being and to perish, to be and not,
> As well as to change place and to vary in bright colour.
>
> (*Parm. frag.* 8, line 39-41)
> [Smith Trans.]

It was also Parmenides who mentioned the unreliability of the senses when trying to reconcile the contradiction between the change that is observed, and reality.

> And do not let ingrained habit force you to this way,
> Using an imprudent eye and sound-filled ear
> And tongue, but judge by reason the much contested argument.
>
> (*Parm. frag.* 7, line 3-5)
> [Smith Trans.

From his views, the necessity for something permanent and unchangeable, like the later atom, grew appararent, since, as Lucretius, a follower of Democritus, later summarised, *nil posse creari de nilo* ["nothing can be created of nothing"] (*De Rerum Natura*, 1.155). If it were possible, anything could then arise from anything: things could grow at any season rather than within the current confinements, no time would be needed for growth, animals/plants could be produced without water and food, and there would be no limit as to the size for anything when growing (*Rouse*). Clearly, none of the above are possible, and so it must be true that something cannot be created from nothing.

Despite the acknowledgement that something must be permanent, other pre-Socratic philosophers did not disregard change to the extent to which Parmenides did, and so attempted to resolve this paradox through a multitude of reasonings, which became the antecedents of atomism. Scholars today generally agree that resolving the problem of change was the impetus for the development of atomism (Berryman).

2.2 Development of Atomism in Ancient Greece

As the history of the development of atomism has already been extensively discussed (e.g. *Bailey*), I will merely summarise a few notable figures and their contributions to the development of atomism. The monists believed the world to be composed of a single, infinite "one" from which everything came to be, such as Thales', Anaximenes', and Heraclitus' theories of the primary source of the world to be water, air, and fire, respectively. In such a way, they resolved the problem of change by explaining change to be merely the rarefaction and compression of each element, or the upward and downward path of transformation; with transformation, the same element would exist, but merely in a different form

Such monistic explanations, however, became increasingly difficult to justify against reality, as it would be impossible to explain the variety and complexity of the world through fluctuating concentrations of a single substance. Concentrated fire

would only be hotter and wouldn't liquify into water, nor would thinned air become fire or thickened air become water, as Anaximenes claimed, nor could water condense and harden into rock. Furthermore, how would our senses be able to recognise fire or air or water in one form, but not in another? Another objection was that if any one substance was truly infinite, it would have destroyed all others: the heat of fire would have destroyed the coldness of air, or the moisture of water would have destroyed the burning of fire. Such arguments made a homogenous, singular explanation of the world no longer defendable, and gave rise to theories of pluralism.

Pluralism was critical to the development of atomism by conceptualising the possibility of multiple indivisible and permanent elements which, when combined, can result in new compounds and form new objects, though they themselves cannot be divided any further. One such pluralist was Empedocles, who maintained that the world was made up of four elements: fire, air, water, and earth, building upon past philosophers' contributions of opposites (hot and cold, moist and dry) and balance. He answered the problem of change by explaining how the four elements, combined in different ways and proportions, allowed for much more diverse composites and amalgams than those of the previous monistic and dualistic theories. What appeared to be creation was merely a readjustment of the particles of the 'four elements'. Being able to combine the same atoms in a different ratio to formulate different compounds allowed for a much higher number of permutations, which helped to explain the heterogeneousness and expanse of the world by reducing the infinite intricacies and complexities of the world to a few key components.

Another philosopher, Anaxagoras, proposed that everything contained everything: that is, all objects would contain small particles of constituents such as flesh, blood, bone, etc, and their nature would be determined by the ratio of elements. However, neither Empedocles nor Anaxagoras' theory seemed to satisfy the conditions of reality, nor account for change: for the former could not possibly account for all the variance in the world due to the same issues faced in monism, whilst the latter no longer preserved a fundamental unity sought in the world, nor fully explains change.

The theories of monism and pluralism were vital in advancing the development towards atomism. The stage was set for Leucippus and Democritus to reconcile the two schools of monism and pluralism into atomism: Democritus popularised atomism after Leucippus' conception of it.

Democritus theorised that the world was composed of two main aspects: atoms and void. Atoms, from the Greek ἄτομον (literally, "uncuttable"), are small, permanent, indivisible, absolute, unseeable, and infinite existents from which all matter is made. Burnet notes that in this sense, atomism is just as the Eleatic Melissus of Samos observed: 'If there were many, they would be bound to be each of them such as I say the one is' (*Early Greek Philosophy*). In other words, as Bailey puts it, pluralism could only exist if "each particle may have the unity and permanence of a Parmenidean whole" (The Greek Atomists), where although there are many atoms, each atom itself is indivisible.

Democritus believed these atoms are always in motion, and their collisions result in the unifications and dissolutions which shape their reality, or as Simplicius describes:

> While he posited the atoms, an infinite number of elements in continual motion,
> and held that they have an infinite number of shapes.
>
> (Simpl. in Phys. 28.4-27 [DK 67 A8])
> [Taylor Trans.]

In addition to the atoms' constant movement, Simplicius also mentions the atoms' "infinite number of shapes". In order to allow for the multitude of complexity in the world to come from the mere separation and dissolution of the atoms made of the same substance, atoms are not just different in shape (A to N) and size (A to A), but also in order relative to one another, such as AN to NA, and orientation, such as Z to N. According to Aristotle's description of Democritus' theory:

> The differentiations [of the atoms] are the cause of everything else. Now they say that these are three, shape, arrangement, and position... For A differs from N in shape, AN from NA in arrangement and Z from N in position
>
> (Arist. Metaph. 985b4-22 [DK 67 A6])
> [Taylor Trans.]

There are an infinite number of kinds of atoms and an infinite number of each kind of atom, each interacting mechanically through hooks and eyes, balls and sockets, which allow them to connect to one another.

Simplicius comments on Democritus' view on how the atoms join together:

> He explains the fact that the substances remain together for some time by the dovetailing and interlocking of the bodies; for some of them are uneven, some hook-shaped, some concave, some convex.
>
> (Simpl. in Cael. 294.33-395.36 [DK 68 A37]) [Taylor Trans.]

In such a way, these atoms would be able to form any object, explaining phenomena such as how objects of the same size can have different weights (there are different amounts of void in them), how water dries from a towel when wet (the evaporation of water atoms), how metal rings are worn gradually (by "sloughing" off layers of atoms) etc.

Thus, through the theory of atomism, Democritus resolved the problem of change by maintaining the permanence of atoms and their unchanging substance, and reconciled one's perception of change by explaining it via a different arrangement of atoms. In this way, the problem of something coming from nothing would not arise, as the atoms have always existed, and what appears to the coming-into-being of an object would merely be a combination or rearrangement of atoms:

> The Greeks are wrong to recognise coming into being and perishing; for nothing comes into being nor perishes, but is rather compounded or dissolved from things that are.
>
> Anaxagoras, 59 B 17 DK = 469 KRS

3. The Absence of the Problem of Change in China

There are three main reasons as to why change was not particularly problematic in the eyes of ancient Chinese philosophers. Firstly, in Chinese philosophy change was regarded as natural, and so philosophers were not impelled to question the mechanism behind it. Secondly, the theory of *yin-yang* allowed for a more "natural explanation of change", which resolved the issues of change that atomism resolved for the ancient Greeks. Thirdly, on an individual level, the Chinese notion of change was as an exchange of distinguishing features *zheng* 徵 whilst maintaining the object's identity, in addition to change being merely the materialisation of the object's hidden tendencies, negating the issue of spontaneous generation or disappearance.

3.1 Change is Natural

The *Daodejing* 道德經 [*The Book of the Dao and Its Virtue*] , one of the main texts of Daoist philosophy, states that spontaneous transformation is inherent in *dao* 道, allowing for millions of objects to transform themselves [萬物將自化][1]. Moreover, there are many instances of change in the *Zhuangzi* which provide no explanation as to how the change occured, merely describing the change, such as when the fish [*yu* 鯤] simply changes [化而為鳥][2] into the bird [*niao* 鵬] without external force or an explanation, though it should be noted that the *Zhuangzi*《莊子》often uses allegories to explain certain principles and so doesn't need to justify how the change came to be. Nevertheless, such texts suggest that not only is change considered to be self-driven, but also that change without an external stimulus is natural [*ziran* 自然].

Change, according to this line of philosophy, happens naturally and spontaneously of its own accord, following the way of the *dao* 道, and hence existing naturally. Thus there was no need to question this change, since it is constantly and unceasingly growing and changing [生生不息]. As described in the *Yi Jing* 易經 [*Book of Changes*], change is engendered through continuous growth [*sheng sheng* 生生] and life, and the nature of existence lies in spontaneous generation [生生之謂易][3]. Similarly, the *Zhuangzi* describes change as unceasing:

> 萬物化作，萌區有狀，盛衰之殺，變化之流也。
>
> In the transformations and growth of all things, every bud and feature has its proper form; and in this we have their gradual maturing and decay, the constant flow of transformation and change.
>
> (莊子 *Zhuangzi* - 天道 *Tian Dao* [The Way of Heaven]) (34/13/29-30 [Legge Trans.])

[1] 《*Daodejing*》, 第三十七章 ch.37

[2] *Zhuangzi* - 逍遙遊 Enjoyment in Untroubled Ease 1/1/1

[3] *Book of Changes* - 繫辭上 *Xi Ci* I

Furthermore, according to the *Zhuangzi*,

> 化其萬物而不知其禪之者。
>
> The change — rise and dissolution — of all things (continually) goes on, but we do not know who it is that maintains and continues the process.
>
> (莊子 *Zhuangzi* - 山木 *Shan Mu* [The Tree on the Mountain]) (53/20/59 [Legge Trans.])

Change, moreover, is perpetual, undeniable, and unassailable, and must be allowed to run its natural course:

> 物之生也若驟若馳，無動而不變，無時而不移。夫固將自化。
>
> The life of things is like the hurrying and galloping along of a horse. With every movement there is a change; with every moment there is an alteration… You have only to be allowing this course of natural transformation to be going on.
>
> (莊子 *Zhuangzi* - 秋水 *Qiu Shui* [The Floods of Autumn]) (44/17/46-47 [Legge Trans.])

In the *Daodejing* and the *Zhuangzi* therefore, existence is characterised by change, the changes and transformations of life making life what it is. If there is life, then there must be change. Dynamism, moreover, is implicit in existence and necessary for existence. In viewing change in this way, Chinese philosophers would have been able to avoid Aristotle's issue of an infinite regression of causes by explaining that change is due to existence itself. In other words, explaining change by saying *it just happens*.

Because change was viewed as inherent in nature and life, it was a non-issue in Chinese philosophical thinking. In short, change is as inevitable as the ending and beginning of seasons or the passage of time, happening just as naturally and unprompted. The following quote from the *Zhuangzi* summarises that attitude which made change not a reason for concern:

> 焉知其所終？焉知其所始？正而待之而已耳。
>
> How do we know when any one begins? How do we know when he will end? We have simply to wait for it, and nothing more.
>
> (莊子 *Zhuangzi* - 山木 *Shan Mi* [The Tree on the Mountain]) (53/20/59-60 [Legge Trans.])

This difference in the very paradigm in which change is framed in each culture may have played a role in the lack of movement towards atomism in ancient China. The idea that change is natural and unavoidable made it something not worth questioning, therefore sidestepping the need to explain change through a theory such as atomism.

3.2 The Way of the *Dao* and *Yin-Yang*

The ideas of unity, balance, harmony, and opposites were key concepts in ancient Chinese Daoist thought, in which the world was viewed as being in constant change and flux, similar to how the Greek philosopher Heraclitus viewed the world (Burnet). As described by the *Daodejing*, the *dao* 道 is the force that permeates the entire world:

> 大道汎兮，其可左右。
>
> The great Dao flows everywhere, found on the left and the right.
>
> (道德經 - *Daodejing*, 第三十四章 ch.34)

The *dao* existed before the universe:

> 有物混成，先天地生。
>
> There was something undefined and complete, existing before Heaven and Earth were created.
>
> (道德經 - *Daodejing*, 第二十五章 ch.25)

And was even the universe's origin:

> 可以為天下母
>
> It may be regarded as the source of all things.
>
> (道德經 - *Daodejing*, 第二十五章 ch.25)

The *Daodejing* teaches that instead of trying to control the future or the universe around us, which will likely make the situation worse, we should instead focus on ourselves and go along with the natural current and flow of the *dao*, letting go of control and allowing the natural cycles and paths of the universe to move us.

> 為無為，則無不治。
>
> When there is this abstinence from action, good order is universal.
>
> (道德經 - *Daodejing*, 第三章 ch.3) [Legge Trans.]

It then describes how *yin* 陰 and *yang* 陽 came from the primordial oneness of *dao* 道:

> 道生一，一生二，二生三，三生萬物。
>
> The Dao produced One; One produced Two; Two produced Three; Three produced All things
> (道德經 - *Daodejing*, 第四十二章 ch.42)

One interpretation of this quote is that the "one" of *dao* 道 can be divided into the "two" of *yin* 陰 and *yang* 陽. Therefore, with a worldview centered around unity, Chinese philosophers saw the world in terms of the omnipresent, monistic dao, sometimes referred to as the *tai ji* 太極, which later bifurcated into *yin* and *yang*. As such, the entire universe is ordered by the two polar forces of *yin* and *yang*.

In the *Book of Changes*, *yin* is characterised as feminine, passive, and nurturing, while the opposing *yang* is masculine, strong, and the dominant force. *Yang* is associated with heaven [天], while *yin* with earth [*di* 地] (*Ching the Cracle*). In hexagrams, *yin* is represented by a dashed line, and *yang* by a solid line.

Figure 1. Representation of *yin* and *yang* in the *Yi Jing* 易經 [*Book of Changes*]

The theory encompassing the *dao* 道, *yin* 陰, and *yang* 陽 is often represented by the *taijitu* 太極圖, illustrated below. The *taijitu* represents both the monist and dualist aspects in Chinese philosophy by having the whole of the circle as everything, within which are equal parts of *yin* and *yang*, each of which has the opposing force within it to cause balance.

Figure 2. *Taijitu* 太極圖

Surrounding the *taijitu* are eight trigrams. A trigram is formed by any three lines of *yin* or *yang*, with the eight possible combinations (*bagua*, 八卦) representing the eight main elements of heaven, wind, water, mountain, earth, thunder, fire and lake.

When two trigrams are stacked upon each other, they form a hexagram.The hexagrams themselves not only yield an overall interpretation along with specific messages for each line within the *Book of Changes*, but they in and of themselves often contain meaning. For example, the combination of an earth trigram placed atop a mountain trigram carries the meaning 'Humbling' (*qian* 謙), since a mountain would normally sit on top of the earth. 'Flowing' (*huan* 渙), is created by the combination of the wind trigram over the water trigram, representing the movement and ripples of water.

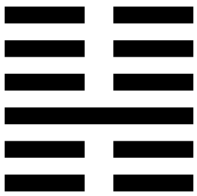

Figure 3. Humbling (*qian* 謙)

Figure 4. Flowing (*huan* 渙)

The book asserts that all that has happened, is happening, and will happen, can be explained through a hexagram [卦] composed of six lines, each of which represents either *yin* 陰 or *yang* 陽, and could either be moving (old) or static (young). If one force has held sway for too long, it is deemed to be old and transforms into the other, which is why it is considered "moving", yielding a new and separate hexagram. Such a representation restricts the world to a dualistic framework, with the trigrams arranged across from its binary opposite, demonstrating the cyclic nature in which the ancient Chinese viewed the world: the world was a continuous, harmonious, whole composed of polar attributes that cycle through one another and balance one another out. Change can therefore be depicted by the transformation of one hexagram into another, viewing the universe in terms of *yin* 陰 or *yang* 陽: one hexagram represents a moment in time, and another a future possibility of change.

The main theme of the *Book of Changes* is the way in which things can only "develop" or move in the opposite direction once they become too extreme [物極必反]. Balance is maintained through this natural and self-regulating process. A specific example within the *Book of Changes* is the changing of *yin* 陰 to *yang* 陽: if either one has been there for too long, it will switch to its opposing counterpart, thereby maintaining a balance and equilibrium. One analogy would be when too much weight on one side of a seesaw causes it to tip and return to equilibrium.

For example, consider the hexagram on the left below, "Augmenting" [*yi* 益].

If the fifth line of yin has already occupied its place for quite some time, it will naturally change into *yang*, forming the new hexagram on the right, 'Center Returning' (*zhong fu* 中孚). Such cycles of balance are a common theme not only in the *Book of Changes*, but throughout Chinese philosophy, such as in relation to the cycle of life and death, or the cycle of the seasons. The changing of the hexagrams into one another reflects the self-renewal of the universe, such as the cycle of seasons, or day and night, with the ability to circle back around. As such, change is a function of time, where the two notions are inseparable, and neither *yin* nor *yang* is allowed to stay stagnant for too long. If there is no change, there is no time, as time entails change, and can even be seen as a measurement of change.

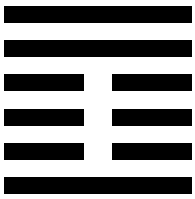

Figure 5. Hexagram of '"Augmenting" [yi 益]

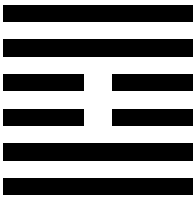

Figure 6. Hexagram of "Center Returning" [*zhong fu* 中孚]

The ancient Chinese worldview has been summarised as "the notion that the cosmos is an organismic process without beginning or end. As a process, the cosmos resembles a great flow in which all of the parts of the entire cosmos belong to one organic whole and all the parts interact as participants in one spontaneously self-generating process" (Hon). In this way, change is explained as the constant exchange of *yin* and *yang*. Because these elements continuously replace one another, there is innate maintenance of equilibrium. Nothing comes from nothing, and, therefore, change is not problematic.

3.3 Change as an Exchange of Features

On a more everyday level, change was viewed not as a complete transformation or absolute change, but rather as an exchange of features or distinguishing characteristics *zheng* 徵 [化，徵易也][4], as the later Mohists defined it. By implying an exchange of distinguishing marks, one for another, the ancient Chinese avoided the problem of things vanishing into nothing or being generated out of nothing.

As Reding describes, the process of change can be divided into multiple stages, an example being the transition from a tadpole to a frog (Comparative Essays):

	From the perspective of the tadpole:	**From the perspective of the frog:**
1	The tadpole has only the distinguishing marks of the tadpole;	There are not yet any distinguishing marks of the frog;
2	Three quarters of the distinguishing marks are those of the tadpole;	One quarter of the distinguishing marks are those of the frog;
3	The distinguishing marks are even for the frog and the tadpole;	The distinguishing marks are even for the frog and the tadpole;
4	Only one quarter of the tadpole's distinguishing marks remain;	Three quarters of the distinguishing marks are those of the frog;
5	There are no distinguishing marks of the tadpole.	There are only the distinguishing marks of the frog.

Rather than viewing change as the disappearance of the original and a coming-into-being of the new, the object remains the same, only changing its distinguishing features. In the Chinese perception of change, nothing was disappearing or reappearing, negating the issue of generating something from nothing. Such a conception of an exchange of elements instead of absolute change - maintaining its self-identity as the same object rather than one object disappearing and a different object taking its place - can be seen further in the *Book of Changes*. All hexagrams must have six lines, of which each must be *yin* or *yang*; it is absurd to even consider the disappearance or addition of a line within the system of hexagrams. The lines, or *yin* and *yang*, therefore provide the permanency which atoms supplied in the theory of atomism, preserving the necessity for something permanent in the world.

Furthermore, Chinese philosophers saw change not as objects turning into something completely different from the object's original nature. Instead, objects maintained their original identities, with change viewed as the object's hidden tendencies materialising into reality, moving into the potentiality they already possessed. One could only "change" into something already inherent in one's own nature (*Blofeld*), having latent propensity in the object's nature. A tadpole is a frog, an egg is a chicken, just not yet, and vice versa. Essentially, Chinese thought is that objects can only change into what they already have the potential to change into. Thus, there is no issue of coming-to-be from nothing or vice versa, as the characteristics of change were already inherent within the object.

[4] 墨子 *Mozi* - 經上 Canon I 66/40/18

This Chinese notion of change is, interestingly, quite similar to Aristotle's later distinction between numerical sameness ("identity") and qualitative sameness ("similarity" or "likeness") (Chappell). When an object changes, it can remain "numerically the same" in the way that a ripening banana is still the same banana, yet it is quantitatively unlike its former state, due to having the different qualities of being yellow and softer. In this way, the object is able to retain its identity, only having its distinguishing characteristics - *zheng* - exchanged, without the actual generation or disappearance of any substance.

Conclusion

Philosophers in both ancient China and ancient Greece worked through similar lines of thinking regarding the very big, the very small, and paradoxes involving the problems of infinite divisibility, which are widely considered to have led to the development of atomism in ancient Greece. However, despite the remarkably parallel thoughts, the theory of atomism was never formally developed in ancient China. A key difference between the Greek and Chinese philosophical thinking on this was the way in which they approached the notion of change. In China, there was an absence of such a problem, owing to a drastically different worldview.

As evidenced by the *Book of Changes*, ancient Chinese philosophers viewed the world through the dualism of *yin* and *yang*, derived from the monistic *dao*. In doing so, the world is perceived as a united, cyclistic whole rather than individual constituents, reflecting Chinese language itself, which is a lens through which the philosophers viewed and described their world. Change was considered to be the transformation of one hexagram into another, and as a natural balancing of *yin* and *yang*, rather than as the disappearance of matter and then the existence of something out of nothing, as the ancient Greeks saw it. *Yin* would replace *yang*, *yang* would replace *yin*, but neither would ever simply disappear. On an individual level, change was perceived as the exchange of distinguishing features whilst retaining the object's original identity. Not only does this correspond to the idea of balance in a dualistic worldview, but the enduring *yin* and *yang* provided the permanency needed in any understanding of the universe. Furthermore, change was considered to be as inherent in nature, constant, and unavoidable, with spontaneous transformation as the norm, making it unlikely that philosophers in China would have questioned change and its mechanisms.

Thus, it is clear that the different conceptions of change is a key difference between the two cultures, with the ancient Greeks viewing change to be problematic, whilst the ancient Chinese did not, resulting in the development of atomism in the former and not the latter. These different notions of change demonstrate a distinction in worldview between the two cultures, potentially arising from the difference in their respective linguistic frameworks. Though not within the scope of this essay, the influence each culture's language had on their worldview and therefore their conceptions of change is worthy of future investigation.

For example, Joseph Needham, a prominent sinologist after whom the Needham Research Institute is named, made the observation that all civilisations which developed atomic theories had an alphabetical language, wherein a set group of letters make up the entirety of language and communication, not unlike the atoms which make up the whole of the world. Aristotle himself noted the similarity between the two concepts, writing, "a tragedy and a comedy are composed of the same letters" (*On Coming into Being and Passing Away*, 1.2315b6– 15), in reference to the atomic theory of Democritus. In contrast, the Chinese language treated each word as an individual unit rather than a combination of different brush strokes, similar to how they viewed the world as one harmonious whole. As Wittgeinstein said, "the limits of my language mean the limits of my world." Perhaps, therefore, as the Sapir-Whorf hypothesis suggests, language accounts for differences in Chinese and Greek thinking about the composition of the world: the former is synechistic (holistic, continuous), and the latter divisionist. Of the two, a synechistic world view is less likely to divide the world into small units, such as atoms, because things are seen from a holistic and continuous perspective.

To conclude, as a result of the aforementioned reasons, change was not a problem for ancient Chinese philosophers, and there was never an intellectual need for the theory of atomism because the Chinese had the theory of *yin* and *yang* to account for change. Consequently, due to a very different understanding of the phenomenon of change, the conceptual prerequisites and paradoxes that existed in both ancient Greek and ancient Chinese thought did not result in the development of the theory of atomism in ancient China.

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Artist: Katrina Chan, G9

Title: Reflection in Qing

Medium: Digital painting

Description: This digital artwork was created in response to the Statement of Inquiry "Signs and symbols can express cultural identity". In this unit, students explored both traditional and digital painting to explore signs, symbols and metaphors that express their personal cultural identity.