Elixir, Urine and Hormone:  
A Socio-cultural History of Qiushi  
(Autumn Mineral)∗

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Abstract: Traditional Chinese medicine has attracted the attention of pharmacologists because some of its remedies have proved useful against cancer and malaria. However, a variety of controversies have arisen regarding the difficulty of identifying and explaining the effectiveness of remedies by biomedical criteria. By exploring the socio-cultural history of qiushi (literally, ‘autumn mineral’), a drug prepared from urine and used frequently throughout Chinese history, I examine how alchemy, popular culture, politics and ritual influenced pre-modern views of the efficacy of the drug, and explore the sharp contrast between views of the drug’s

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function and efficacy in the context of Chinese medicine and contemporary biomedical knowledge. Questioning the biomedical hypothesis that qiushi contains sex hormones, I find that the popular, centuries-long use of qiushi correlates with the efficacy of what has been called ‘the meaning response,’ the merging of alchemy and medicine, the influence of social relations, and the division and mixture of theory and practical use.

The case of qiushi 秋石 (autumn mineral), an elixir and medicine prepared from urine and a popular treatment for centuries, provides an excellent opportunity to examine the sharp cultural, philosophical, and experiential contrasts between the Chinese medical tradition and the analytical approach using biochemical methodology. Qiushi 1 was a medicine prepared mainly from urine by Chinese alchemists and physicians beginning in the tenth century. It was widely used as a drug to treat disease and lengthen life. Qiushi has intrigued many scientists and historians of science since Drs. Lu and Needham first proposed in 1963 that qiushi was a mixture of steroid hormones in a relatively purified form and could be used to treat many hypogonadal conditions.2 Over the past fifty years, significant theoretical and experimental investigations have shown that qiushi contains fewer sex hormones than the urine from which it is prepared.3 Because these studies have been preoccupied with ancient anticipations of modern chemistry,4 they have overlooked the crucial cultural aspects of qiushi. The story of qiushi is more than just another

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1 The term qiushi referred to different substances in the history of Chinese alchemy and medicine. The subject of this article is the qiushi prepared mainly from urine. Qiushi prepared from urine has not been used since 1995, while salty qiushi (xian qiushi 鹹秋石) made from table salt is still used as a drug today.


3 Liu Kwang-Ting argued that qiushi did not contain sex hormones because the urine from young boys had low level of sex hormones and Chinese honey locust cannot precipitate sex hormones; see Liu Kwang-Ting (1981), pp. 74-77. By reproducing the experiments according to the records in medical books, Zhang Binlun and his coauthors proposed that qiushi did not contain sex hormones. See Zhang Binlun and Sun Yilin (1988), pp. 170-183; Zhang Binlun, Gao Zhiqian and Ye Qing (2004), pp. 1-15. H. T. Huang and his coauthors proposed that whether qiushi contained sex hormones or not depended on its preparation methods. See Huang et al. (1990), pp. 63-65.

4 Sivin (1990), pp. 3-20.
empirical case study: it is about the complexity and cultural manifold of the preparation, and the efficacy and practice of medicine in the Chinese tradition in its own context.

In this article, I will examine the medical-cultural history of qiushi using the cultural-manifold approach, rather than viewing it as a failed attempt at modern medicine. In different periods, the uses of qiushi varied with respect to the preparation methods, which were accompanied by complex rituals; the social status of the physicians who defined qiushi’s functions; and the popular culture of urine therapy. Qiushi’s functions were even affected by political change. Therefore, this inquiry examines many dimensions of qiushi, not merely its chemical ingredients or techniques. Focusing on the efficacy of qiushi, this study examines the explicit connections between culture, polity, ritual, belief, society and the effectiveness of medicine. Furthermore, by contrasting the comparative work of the cultural approach with the analytical approach using biochemical methodology, I will note the consequences of separating the study of Chinese herbal or mineral medicines from the cultural viewpoint that informs their use.

Multifocal origins of qiushi: popular culture, alchemy and classical medicine

Drugs derived from the human body, including organs, bodily fluids, and excreta, were commonplace in the early history of medicine. Why did the Chinese prepare qiushi from urine and use it as a drug? Lu and Needham proposed that its use was linked to beliefs about the sexual organs in Chinese medical thought and practice, such as the use of testicular tissue as a therapeutic agent in cases of hypogonadism, the medical use of the placenta, and the association of urine with sexual activity. However, this positivist view, which treats alchemy as parallel to modern inorganic chemistry and iatrochemistry, overlooks the fact that the goals of medicine

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6 Cooper and Sivin (1973), pp. 203-272. Interestingly, fecal microbiota transplantation, first recorded in a fourth century Chinese medical book called Handy Therapy for Emergencies (Zhouhou beiji fang 肘後備急方), have been studied and utilized sporadically in numerous applications for more than fifty years in mainstream biomedicine. For a discussion about fecal microbiota transplantation in biomedicine see Borody and Khoruts (2012), pp. 88-96. For the record of using human fecal suspension by mouth to treat patients who had food poisoning or severe diarrhea, see Zhouhou beiji fang, chap. 1, p. 13; chap. 2, p. 32.
7 Lu and Needham (1964), pp. 101-121
and alchemy in the Chinese tradition were not cognitive, and fails to consider its relation to culture and philosophy. As I shall demonstrate, the origins of the practice of preparing *qiushi* from urine are "a hodgepodge of specific remedies, measures, and deritualized rituals."  

**Urine as a drug**

*Qiushi* preparation originated in both popular medicine and classic medicine. Urine has been used as a remedy for thousands of years in China. The oldest extant medical handbook, which was written between 400 and 300 BCE and is called *Fifty-two Formulas for Diseases* (*Wushier bing fang* 五十二病方) by its modern editors records many recipes made with a young boy’s urine. For example, this ingredient was used to cure the effects of arrow-poison, and sometimes other drugs were boiled in urine. The *History of Eastern Han Dynasty* (*Hou Han shu* 後漢書) also records that three Daoists prolonged their lives by drinking urine during the period from 6 to 189 CE. Urine, especially children’s urine, was either drunk directly or mixed with other herbal medicines. Some Chinese adults still practice urine therapy, mainly by drinking their own urine. In early classical medicine, urine was used alone as a remedy for aphonia caused by chronic cough (*jiuke shiyin* 久咳失音), headache, hot sensations (*rebing* 熱病), and steaming bone fever (*guzheng fare* 骨蒸發熱). In popular medicine, urine was used as emergency treatment for poisoning or faintness and was applied in cases of heat stroke, snake or spider bites, or when the flow of blood cannot be staunched.

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10 *Wushier bing fang*, pp. 47, 51, 106, 109. This manuscript is earlier than the *Huangdi neijing* 黃帝內經 (Inner Scripture of the Yellow Emperor), and reveals the use of exorcism, magic, talismans, and other therapies in the period leading up to the creation of the medicine of systematic correspondence. See Pregadio (2008), p. 738.
11 *Hou Han shu*, chap. 82B, p. 2750.
12 *Wuzhuang beicun* 霧莊北村, a village in Shanxi, is specially named “Urine therapy village” (*Niaoliao cun* 尿療村) because most of the villagers are practitioners. Practitioners nationwide have organized communities in Liaoning, Guangdong, Shanxi and other provinces. Liaoning was the first province to advocate urine therapy in 1994, and had 30,000 persons personally practicing it by 2001. See Jiang Min (2001); Wu Jing and Chen Yu (2007).
13 *Beiji qianjin yao fang*, p. 124, 252, 469; *Bencao jing jizhu*, p. 394.
14 *Zhouhou beiji fang*, chap. 1, p. 13; chap. 2, p. 32; chap. 7, p. 134. Ge Hong drew freely on popular therapy in his *Zhouhou jiu zu fang* 射後救卒方 (Emergency
Different meanings of qiuishi in external and internal alchemy

The term qiuishi was used to describe many different materials until it came to refer exclusively to medicine prepared from urine.\(^{15}\) In *Token for the Agreement of the Three According to the Book of Changes* (*Zhou yì san tong qi*, from ca. 700 CE),\(^{16}\) qiuishi is described in arcane language. The book provides no further information about it except the claim that Liu An (179–122 BCE) made it.\(^{17}\) Based on our knowledge of alchemy in that period, it is likely that qiuishi was an elixir made from minerals. After the Wei period, no record of qiuishi is found until the seventh century. The name ‘qiuishi’ often referred to various substances in alchemical works written during the seventh to tenth centuries. The *Record of an Explication of the Mysteries* (*Xuan jie lu*, preface dated 855) states that “the sage prepared qiuishi from deposits of frost on the ground (dishuang), and regarded it as a mineral.”\(^{18}\) In this statement, the sage referred to could be Liu An; the white, crystalline, salt-like frost called dishuang is formed when the salt in a salt lake effloresces. Furthermore, the opinion that qiuishi is xiaoshi is clearly stated in another anonymous book entitled *The Fivefold Classification of Metals and Minerals of the True Gentleman Yin* (*Yin zhenjun jinshi wuxianglei*).\(^{19}\) Xiaoshi refers to either impure saltpeter or impure Glauber’s salt in these early records, so this source considers qiuishi to be the same as xiaoshi. Moreover, it provides information about the origin of the name ‘qiuishi’: xiaoshi was applied to remove the toxicity of minerals such as orpiment, realgar and sulfur, because the yin side of xiaoshi or qiuishi belonging to the autumn.
overwhelms the yang side of the latter minerals belonging to the spring. Thus, xiaoshi is called qiushi (autumn mineral). Another record of qiushi is found in Essential Outline of the Marvelous Way of the Authentic Origins (Zhenyuan miaodao yaolue 真元妙道要略), which was written sometime between the ninth and tenth centuries. Its reference to qiushi is unique; the author describes it as that which results from boiling the ash of mulberry wood. A passage from the Original Mirror of Alchemical Prescriptions (Danfang jianyuan 丹方鑒原), a treatise on internal alchemy, indicates that qiushi can be used to make white glaze. Until the eleventh century, alchemists still considered qiushi a mineral elixir. In Commentaries on the Essay on Realizing the Necessity of Regenerating the Primary of Vitalities (Wuzhenpian zhushu 悟真篇註疏), another internal alchemy treatise, the author criticized the methods that external alchemists used to prepare elixir from natural minerals, such as mercury, cinnabar, orpiment, realgar, qiushi, etc. The criticism implies that the nature of qiushi was the same as that of these minerals.

In addition to these writings on becoming immortal using drugs, some authors regarded qiushi not as a material substance, but as the greatest elixir in internal alchemy, in which spiritual exercise enabled man to generate creative energy within him. Internal alchemy focuses on inner cultivation, and (like external alchemy) is closely associated with deities that reveal knowledge and guide disciples along the path to transcendence. Although the Token for the Agreement of the Three According to the Book of Changes does not explain what qiushi is, its discussion attracted later alchemists because of the importance and popularity of this book. Su Yuanlang 蘇元朗 mentions in his Basic directive on the Dragon and Tiger (Longhu yuanzhi 龍虎元旨) that both qiushi and yellow sprouts (huangya 黃芽) refer to the same substance, and that different alchemy texts use different names for these substances. Moreover, the name qiushi is connected with the system of symbolic correlations of the Book of Changes (Yijing 易經) because the color of qiushi is white and the climax of the yearly cycle of life, autumn, is also white. Records in eleven other internal alchemical works further support Su’s assertions. These works include Mental Mirror and Directions Regarding Discourses and Explanations on the Elixir (Danlun juezhi xinjian 丹論決旨心鑒) and A Song on the Dragon and Tiger Cyclically Transformed Elixir (Longhu huandan ge 龍虎還丹歌).

20 Yin zhenjun jinshi wuxiangle, pp. 35b-37a.
21 Zhenyuan miaodao yaolue, pp. 1b-2a.
22 Danfang jianyuan, p. 7b.
23 Wuzhenpian zhushu, chap. 2, pp. 3a-4b.
24 Longhu yuanzhi, pp. 4b-5b.
25 Danlun juezhi xinjian, pp. 6b-7a; Longhu huandan ge, pp. 3b-4b.
In contrast to the various meanings of the substance in external alchemy, all internal alchemy texts regarded qiushi as a precious elixir. It was produced by meditation, however, not a material substance.

Other internal alchemical writings, such as the Essential Outline of the Marvellous Way of the Authentic Origins and the Record of the Immortals of the Huizhen (Hall) on Xishan (Xishan quanxian huizhen ji 西山群仙會真記), mention the activity of preparing an elixir with urine. However, they call this type of elixir ‘lead and mercury’ (qiangong 鉛汞) or ‘cyclically transformed elixir’ (huandan 還丹). The term huandan is among the most ancient, persistent, and prominent synonyms for elixir in Chinese alchemy. Before the tenth century, qiushi was either prepared by meditation on the living body by internal alchemists or by use of natural metals or minerals by external alchemists.

I found the earliest extant description of qiushi prepared from urine in a medical text titled Good Formulas (Liang fang 良方), which was written in the 1080s by Shen Kuo 沈括 (1031-1095). The text gives detailed instructions for preparing qiushi and using it as a drug. Beginning in this period, descriptions of the preparation and use of qiushi appeared frequently in medical books. How did qiushi enter classical medicine from alchemy? This shift correlates with changes in alchemy, especially with the new tradition of internal alchemy. The aim of alchemy is to achieve immortality through spiritual and physical perfection. External alchemy focuses on making ingestible material (lit. external) elixirs (waidan 外丹), mostly from metals and minerals, in laboratory crucibles. This practice continued until the eighth century, when the deaths of at least four Tang emperors were ascribed to the toxicity of material elixirs. Beginning in the

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26 Zhenyuan miaodao yaolue, pp. 1a-2b; Xishanquanzhen huizhen ji, chap. 4, pp. 6b-7b.
27 Lu and Needham proposed that the first of recipe about preparing qiushi was in a now lost work jingyan fang 經验方 (Tried and Tested Prescriptions). See Lu and Needham (1964), pp. 101-121. I have argued, however, that this conclusion is not well evidenced. See Zhu (2012b).
28 The description of qiushi has been attributed to Shen Kuo in his Liang fang of the 1080s. Liang fang was lost and was reproduced in the extant Su Shen liang fang, which combined Shen’s book with some medical jottings by Su Shi 蘇軾.
29 Su Shen liang fang, chap. 1, pp. 5b-9a.
30 Alchemist-pharmacists widely preferred arsenic minerals, such as orpiment and realgar, to prepare elixirs in sealed crucibles by heating. Relatively pure arsenic was obtained and used for alloys. See Zhu and Ren (2016), pp. 1086-1089.
31 See Skar (2003), p. 228. Some of the metals and minerals used by the early alchemists were highly toxic, and consequently many cases of elixir poisoning were reported. For a more detailed discussions on elixir poisoning, see Needham and Ho (1959).
eighth century, some texts praised the potency of internal elixirs (neidan 内丹) on the human body, and stressed the cultivation of one’s own vital energies, discrediting laboratory work. These forms of alchemy regularly denied the value of the laboratory, and instead asserted that internal cultivation was the only way to achieve transcendence. Some claimed that all alchemy was internal, and that earlier treatises that discussed laboratory procedures did so to distract the uninitiated.

With external alchemy’s shift in focus from laboratory elixirs to body-based restoratives, urine began to be used to prepare elixirs instead of minerals or metals. This was not only because urine is derived from the body and stores vital energy, but also because qiushi has always been regarded as a great elixir in alchemical writings. The process of preparing qiushi was the same as that formerly used to prepare laboratory elixirs. This might have been because some alchemists had skills both in external and internal alchemy. Besides the descriptions about qiushi prepared from natural minerals or metals or by meditation on the living body, some records written in late Tang or the Five Dynasties (tenth century CE) refer to an elixir made from urine by alchemists, but not called qiushi. Urine as well as tears and saliva were regarded as precious materials with which to make the elixir of golden fluids in alchemical texts, because they were from the same inborn vital energy.

Internal alchemists were convinced of the possibility of making an elixir from the fluids and substances of the living body, and they used many technical terms in common with the laboratory alchemists. Thus, it appears that the preparation of qiushi had a dual nature, as the act of preparation was based on the principles of external alchemy, but urine comes from the human body, which is the domain of internal alchemy. Thus, qiushi was the result of the attempt to combine laboratory and internal alchemy, that is, to apply laboratory terminology to the visualizations of internal alchemy.

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32 Many innovative alchemical traditions between the mid-Tang and mid-Ming dynasties viewed laboratory work as superfluous to its core aims and vision. The centerpiece of alchemical innovation lay in approaches that used earlier alchemical models as representations of the refining of the inner elixir within the crucibles of the human body. See Skar (2003), p. 98.

33 There was a transformation from external alchemy to internal alchemy between the late Tang, the Five Dynasties and the early Song. During this period, the theories of practicing both internal and external alchemy 内外丹兼修 were interpreted in alchemical texts. See Ren (2001), pp. 522-524.

34 These records just say there were people who prepared the elixir from urine, though they give no further information. See Zhenyuan miaodao yaojue, pp. 1b-2a; Jinye huandan baiwenjue, pp. 20a-20b.

Shen Kuo records that in Guangnan there was a man who, with his associates, made a living by preparing qiushi. However, qiushi was still criticized by internal alchemists because its process and material were external.

**Qiushi as a drug in classical medicine**

As a result of the connection between transcendence and the use of drugs for therapy, and because some scholar-physicians accepted symbolic practices derived from popular religion, qiushi found a legitimate place in medicine. Thereafter, scholar-physicians provide three interpretations of qiushi prepared from urine. Firstly, urine preserves the body’s innate vital energies (yuang qi) or vitalities. In the Chinese medical tradition, the human body is treated as a whole, and everyone is born with a certain endowment of vital energies. The wear and tear of life gradually depletes this energy. Urine, like all other body fluids, contains vital energies. Those who prepared qiushi believed that, due to its complex preparation, it retains its essential and useful properties and can therefore replenish vital energies that have been consumed. The first clear medical explanation of qiushi appears in *The Weighing of Opinions in the Baoqing Reign Period Materia Medica* (*Baoqing bencao zhezhong* 寶慶本草折衷), completed in 1248, which states:

> Qiushi is derived from the authentic primordial vital energies. If the body’s vital energies are consumed, the body can still return to its primordial state. It is the same principle as repairing broken bamboo furniture with bamboo and repairing torn clothes using textiles.

秋石者，出於人之真元，夫本元之斫耗，若又以本元者復以補之，猶窗屏破補以紙，身衣破補以衣之義耳。

Naturally occurring urine sediment was called *ni bai yin* 溺白廈 or *renzhong bai* 人中白, and its first recorded use was in the Tang dynasty. The nature of qiushi differed from that of *ni bai yin* because it preserves the essential *qi* 氣 of urine. Secondly, urine was considered to be chilling and therefore potentially harmful to the stomach. When preparing qiushi from urine, the chilling property was neutralized by heating or washing. It was therefore considered healthier to take qiushi instead of urine. Thirdly, qiushi was

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36 The Guangnan circuit (*lu*) was set up in 971; it included today’s Guangdong, Guangxi and Hainan provinces.
37 *Su Shen liang fang*, chap. 1, p. 8a.
38 *Baoqing bencao zhezhong*, p. 110. This is the earliest *materia medica* book in which qiushi is listed as an individual drug.
39 *Yaoxing tongkao*, chap. 6, p. 31.
considered much cleaner than urine and *ni bai yin* because it was produced through a complex process of heating or washing. Li Shizhen 李時珍 (1518-1593) proposed that alchemists process urine to obtain *qiushi* because highborn people dislike dirty urine. Because of the complicated origins of *qiushi*, physicians used it as a drug to treat disease and lengthen life. Moreover, the explanation of the name *qiushi* in classical medicine changed to its preparation with dew or urine collected in autumn.

**Preparation methods**

Since the Northern Song period, *qiushi* has been prominent in classical medicine. A record of *qiushi*’s place in Chinese pharmacopoeias can be found in the *Materia medica of the Great Prospect era* (*Jing shi zheng lei Daguan bencao* 經史正類大觀本草), written in 1108 by the hereditary physician Tang Shenwei 唐慎微 (c. 1056-1093). This text lists *qiushi*, indicating that classical physicians recognized it. The *General Record of Sagely Benefaction* (*Sheng ji zong lu* 聖濟總錄), an enormous formulary published by imperial command in 1117, records a method for preparing *qiushi*. Numerous medical books record methods for preparing it, and include formulas in which *qiushi* is an ingredient. How was it prepared, what were its functions, and which diseases was it used to cure? Previous studies have collected fifty-nine methods for preparing *qiushi*, but have analysed only ten of them in any detail. The dispute about whether *qiushi* contained concentrated sex hormones focuses primarily on two questions: are there any other preparation methods beyond those discussed in previous studies—which reduced the concentration instead of increasing it—and how old were the people whose urine was used to prepare *qiushi*? Besides answering these questions, I investigate the known preparation methods, approaching the Chinese medical tradition from a cultural and philosophical perspective.

**147 preparation methods**

By searching texts from different periods, including medical and non-medical works, I collected 147 different *qiushi* preparation methods with urine as the main constituent, excluding the methods for preparing *qiushi* mainly from salt, from 65 books. Among these, 88 have not been mentioned and 137 have not been investigated by other scholars. As Figure 1 shows, beginning with the first two methods mentioned in *Good Formulas*

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40 *Bencao gangmu*, chap. 52, p. 20a.
41 *Sheng ji zong lu*, pp. 3027-3028.
42 I count only preparation methods which totally differ in the type of urine used and in procedures. And I only count preparation methods on their earliest occurrence.
in the 1080s, the diversity of ways to prepare *qiushi* increased until it reached a climax in the sixteenth and early seventeenth centuries. Records detailing how to prepare *qiushi* continue to appear until the early twentieth century. After Western medicine was introduced to China, several doctors discussed whether *qiushi* should stop being used. From 1995 onwards, all traditional Chinese medicines that were derived from excreta, including *qiushi* prepared from urine, were excluded from the national pharmacopoeia, although a salty *qiushi* prepared from crude salt was included.

**Figure 1. The trend in the number of methods per century for preparing *qiushi***

Of the 147 preparation methods, three methods begin with precipitation from urine, and the remaining 144 methods start with large amounts of urine. Many other materials are then added to make *qiushi*. Depending on the purpose, some of these ingredients were added to eliminate impurities, such as juice of soap-beans (*zaojiao zhi* 皂角汁), gypsum, well water, autumn dew, rainwater, and water melted from snow. Some ingredients were added to improve the healing value of *qiushi*, such as *Atractylodes*, pine and cypress, almond juice, human milk, aluminate, *Nardostachys chinensis Batalin*, lard oil, and snow pear. Most of the preparation methods give detailed instructions. I divided the 147 preparation methods into four categories: those that used gypsum, those that used neither gypsum nor

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43 *Qiushi* prepared from urine was not available in pharmacopoeia published in 1995. See Zhonghua renmin gongheguo weishengbu yaodian weiyuanhui (1995).
heat, those that used heat but no gypsum, and those in which a solid material was immersed in urine.

In the first category, the following steps were used to make *qiushi*: add powdered gypsum to the urine; stir well with a mulberry stick and allow precipitate to settle; separate and filter the precipitate; then repeat the above processes several times in a different sequence. In some methods, bricks are immersed in the mixture or the precipitates are heated several times.

The second category, called the yin purification method (*yinlian fa* 陰煉法), involves a long series of precipitations. The following steps are used to prepare the drug: add the juice of soap-beans or other types of water or materials; stir with a bamboo or other type of stick; separate and filter the precipitate; finally dry it in the sun or with straw ash.

Most of the methods in the third category, called the yang purification method (*yanglian fa* 陽煉法), follow the same precipitation procedures as the second one, but involve the extra step of heating the precipitates or urine directly in closed vessels with or without evaporation or sublimation. Alternatively, the precipitates may be dissolved in water and then heated and evaporated, and after which the above steps are repeated several times in a different sequence.

In the fourth category, a solid material, such as a clay brick, a piece of cloth, straw sandals, or a clay bowl, is immersed in the urine until the mixture of urine and solid materials dries naturally. The white solids or crystals that form on the surface are then collected, or burned with a mixture of straw sandals. For the purposes of this discussion, we call the fourth category the solids method.

**Details of processing**

As Table 1 shows, restrictions on the ages of urine donors varied according to time. In the Song and Yuan periods, urine was collected from the general population or from male adults. In the Ming period, most of the methods required urine from adolescents, especially boys. In the Qing period, most of the methods required the urine of adolescents but did not give a specific age limit.

A variety of rituals were performed during the urine selection and preparation process. Twenty-six of the preparation methods indicate that the urine and dew should be collected in the autumn, because in that season, the chill of the air marks the beginning of a downward movement in the seasonal cycle. Autumn dew or urine can therefore increase the drug’s efficacy in nourishing yin and reducing fire in the body, which also follows the seasonal rhythms of nature. Thirty of the methods set
Table 1. Restrictions on the ages of urine donors by period

<table>
<thead>
<tr>
<th>Period</th>
<th>General population</th>
<th>Boys and girls with a specific age limit</th>
<th>Boys and girls without a specific age limit</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Number of methods</td>
<td>Percentage (%)</td>
<td>Number of methods</td>
</tr>
<tr>
<td>Song</td>
<td>5</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Yuan</td>
<td>2</td>
<td>100</td>
<td>0</td>
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<tr>
<td>Ming</td>
<td>20</td>
<td>21</td>
<td>28</td>
</tr>
<tr>
<td>Qing</td>
<td>13</td>
<td>33</td>
<td>2</td>
</tr>
<tr>
<td>Republican</td>
<td>1</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Period</td>
<td>Total</td>
<td>41</td>
<td>28</td>
</tr>
</tbody>
</table>

restrictions on the age of the urine donors and establish requirements. Materia Medica (Bencao gangmu 本草綱目) reads:

Use boys and girls free from any illness as the donors of the urine. Bathe them and change their clothes. Collect one dan (87 liters) of urine from each group separately. Provide them with clean food and drink and salty soup. Avoid [giving them] leeks, onions, garlic, ginger, and anything pungent or rank.45

The writings of Wu Zhiwang 武之望 (1552-1629), in addition to dietary restrictions, require that the donors be eleven to sixteen years old and have bright eyes, graceful eyebrows, full moon faces, rosy lips, pretty white teeth, black hair, clear voices and silky, smooth skin. Furthermore, the donors should adjust their daily diet and life in stipulated ways for one hundred days. Their urine should be stored in an earthenware pot in a quiet place.46

In another preparation method, Gong Juzhong 龔居中 (fl. 1624-1630) suggests that the donors should be three to ten years old and get adequate sleep; furthermore, their urine should be collected as soon as they get up in the morning before they have eaten breakfast; otherwise, the urine is useless. In addition to the complexity of gathering materials and processing

44 The dates of dynasties are: 960-1279 (Song), 1279-1368 (Yuan), 1368-1644 (Ming), 1644-1911 (Qing); Republican period: 1911-1949.
45 Bencao gangmu, chap. 52, p. 22a. These restrictions are conventional in purification rituals.
46 Jiyang gangmu, p. 911.
them, *qiushi* preparation also includes religious and ritual elements. Rites were regularly performed when preparing *qiushi* for familiar medical applications. After the collection of urine, Gong prescribes the following method:

Put well water into a pot, and wait till the mixture has settled. At sunrise, take the pot and face it upwards in order to take the essence of the sun. At moonrise, take the pot and face it upwards in order to take the flower of the moon. And when the dew comes, stir it two or three times, then take it indoors and put it by the bedside, to wait for the boy or girl to wake up. Then once more take it out and bring it in, and purify the mixture as before, taking the essence and flower of the sun and moon and the *qi* of the four seasons. You may start from the 15th of the first month and end at the tenth month. When you have several pots, wrap them in bamboo cortex, seal their mouths with yellow mud, and bury them in south-facing ground. You must dig them in to a depth of three feet, and cover them over with *Imperata* grass. Then wait for ten days after the winter solstice; that is [when] the yin and yang will have dissolved into one another, and True Frost has formed.47

In some preparation methods, the urine was stirred one thousand times with a combination of the branches of mulberry trees from the south, elms from the north, pagoda trees from the east, willows from the west, and pines from the center.48 Furthermore, some preparation methods apply the principles of the *Book of Changes* to find a special location and to determine the number of the pots and the weight of the materials. Moreover, they describe rites for obtaining possession of *qiushi*, special days for collecting the precipitate or sublimate, special times of day for its administration, a special texture for the container, and even assert the need to conceal the product or the requirement that it be taken in silence.

For example, *Occult Pearls from the Red River* (*Chishui xuanzhu* 赤水玄珠, 1584), indicates that the number of bricks immersed in urine should be

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48 *Zunsheng bajian*, chap. 17, pp. 5a-5b.
twelve, the number of pots should be five and the height of the platform should be 3 chi (about 1 meter), to maintain concord with nature and obey the authority of the Way of Heaven (Tiandaо 天道), thus improving the efficacy of qiushi.\textsuperscript{49} The ritual elements in qiushi preparation are especially present in the use of secret names and times. Qiushi is called Stone of the Dragon and Tiger (longhu shi 龍虎石)\textsuperscript{50} or Auroral Snow Elixir of the Dragon and Tiger (longhu xiuxue dan 龍虎霞雪丹), or Real Mercury (zhengong 真汞).\textsuperscript{51}

In conclusion, the methods for preparing qiushi vary greatly, and the processes are not only complex but also full of ritual and religious elements.

**Practical uses of qiushi and sex hormones: beyond an aphrodisiac**

The obvious next step is to investigate the practical uses of qiushi. Previous studies\textsuperscript{52} of the diseases treated with qiushi were primarily based on the claim that qiushi contained sex hormones. Furthermore, some modern writings consider qiushi an aphrodisiac because of the claim that it contained sex hormones.\textsuperscript{53} A modern discussion of the history of the Jiajing reign-period (1521-1566) also claimed that qiushi was used as an aphrodisiac by the emperor.\textsuperscript{54} In the sixteenth century, some physicians and members of the elite, like Li Shizhen and Xie Zhaozhe (謝肇淛) (1567-1624), noted critically that some contemporary sexually active people misused qiushi to tonify yang.\textsuperscript{55}

Lu and Needham’s use of an analytical approach based on biochemical methodology was a major departure. However, their claim that qiushi contained purified active sex hormones was not based on experimental reconstruction of the ancient preparation processes, and several subsequent attempts to replicate these processes in laboratories have led to the conclusion that they could not produce purified or even concentrated sex hormones. However, these reconstruction experiments did not employ many of the preparation methods noted above, and were not carried out

\textsuperscript{49} Chishui xuanzhu, chap. 10, pp. 84b-85a.
\textsuperscript{50} Chishui xuanzhu, chap. 10, pp. 81a-83a.
\textsuperscript{51} Yi bian, chap. 5. pp. 31ff.
\textsuperscript{53} Yang (1977), pp. 59, 64; Yan (1977).
\textsuperscript{54} Zhang (1992), p. 100.
\textsuperscript{55} Wu za zu, chap. 11, pp. 194-195.
strictly as prescribed by the original methods.\textsuperscript{56} After carefully determining the ages of the urine donors, collecting as many preparation methods as possible, and analyzing the possibility of obtaining active hormones theoretically, we followed carefully the formula given in the \textit{Guide to Drug Processing} (\textit{Xiushi zhinan} 修事指南, 1704),\textsuperscript{57} and found that the result contained testosterone, a male sex hormone. However, its proportion and purity are so low that, from a biomedical perspective, it would be of no use for treating hypogonadal conditions and would have negligible effect as an aphrodisiac.\textsuperscript{58} Preparations based on other methods indicate that most formulas do not yield pharmacologically active hormones.\textsuperscript{59} The question then becomes one of determining the functions of \textit{qiushi} from the perspective of classical medicine throughout its history.

By investigating its cultural and philosophical context, I learned much about \textit{qiushi}'s practical use not only from classical formularies (\textit{fangshu} 方書) and medical cases, but also from literary sketches, local annals, collected essays and medical lots used in temples for prognostication. Our research reveals that the diseases treated with \textit{qiushi} varied greatly depending on preparation method, lineages of physicians, and time period.

First, a review of the basic concepts of the Chinese medical tradition is necessary. This tradition treats the human body as a microcosm, and disorders are viewed as disturbances in the body’s adjustment to seasonal and daily rhythms based on abstract concepts universal in Chinese natural philosophy, most notably \textit{yinyang}, the Five Phases and \textit{qi}. The idea that health depends on balanced body functions lies at the basis of all medicine. This balance depends on the equilibrium of \textit{qi} and its vital processes and their harmony with the seasons and other cosmic processes. Classical

\textsuperscript{56} Zhang and his coauthors overlooked that not all the urine donors in the preparation methods were young boys. Also, they controlled the heating temperature in their experiments using modern techniques. See Zhang and Sun (1988), pp. 170-183; Zhang, Gao and Ye (2004), pp. 1-15. In Huang and his coauthors’ experiments, the urine was concentrated to dryness \textit{in vacuo} and the precipitate was sublimed at 150-180°C. Their procedure is different from the methods described in the original medical books. See Huang et al. (1990), pp. 63-65.

\textsuperscript{57} \textit{Xiushi zhinan}, p. 624. The reason why I chose this formula was the high probability of obtaining sex hormones. The sex hormone in the urine should not be decomposed because the heating temperature is low and there is no evaporating process in this formula.

\textsuperscript{58} The testosterone content in \textit{qiushi} is extremely low, and after the hormone drug is swallowed, it is digested and its efficacy is reduced greatly in the gastrointestinal tract.

\textsuperscript{59} Zhu and Ren (in preparation).
pharmacognosy classified the activity of drugs according to three abstract variables: nature (xing 性), expressed as heating or cooling virtue and allied with yang and yin; sapidity (wei 味), which aligns the drugs with the five flavors, corresponding to the five phases; and toxicity, which indicates whether the drugs were potent when used against invasive pathogens. The way that a drug ingredient acts within the body—and hence its therapeutic effect—is determined by its nature, its sapidity, and the qi circulation channels that it enters. The medical disorders and even the symptoms recognized in ancient China were different from those of biomedicine.

I selected fifteen medical books (see Table 2 on the following page), written from the Northern Song to the late Qing, that discuss the activity of qiushi. Interestingly, qiushi’s sapidity was always considered salty, while its nature was considered warming, neutral or cooling in different periods. In the Song and early Ming, qiushi is always described as salty and warming. In the late Ming, however, some physicians, such as Li Zhongzi 李中梓 (1588-1655), state that the nature of qiushi is slightly cooling, and some consider it neutral. In the Chinese medical tradition, a salty taste is associated with the kidneys and with dissolving masses, removing moisture and phlegm, and softening hardness. Qiushi is white, a color associated with the lungs. Drugs with warming natures are tonics, and cooling drugs are used to treat hot conditions. Therefore, according to the physicians who argued that qiushi is warming, it could be used to tonify and nourish qi and blood, restore vital energy, and cure coughs, lumbago, and consumptive disease. However, according to the physicians who argued that qiushi is cooling, it had value for nourishing yin and moistening the lungs. In addition, the functions and indications of qiushi made it useful in treating coughs, seminal emission, and bone-steaming disease caused by debilitation.

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60 Shennong bencao 神農本草 (The Divine Farmer’s Materia Medica) set up the fundamental principles to collect, compile and classify drugs. The Bencao jing ji zhu developed the theories of nature, sapidity and toxicity. Later medical books on materia medica followed the pattern they set. See Bencao jing yizhu, pp. 2-3; Jingshi zhonglei daguan bencao, pp. 7-9.


62 Leigong paozhi yaoxing jie, p. 175.

63 Such as Bencao fenjing 本草分經 (Discussions on Materia Medica by Meridian Vessels), and Bencao zaixin 本草再新 (Renewed Materia Medica).
### Table 2. Medical books on the sapidity and nature of *qiushi* in different periods

<table>
<thead>
<tr>
<th>Book title</th>
<th>Author (date)</th>
<th>Sapidity, nature and toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Baoqing bencao zhezhong</em> (The Weighing of Opinions in the Baoqing Reign Period Materia Medica)</td>
<td>Chen Yan (1248)</td>
<td>Salty, warming</td>
</tr>
<tr>
<td><em>Yaoxing yaolue daquan</em> (Complete Compendium of the Essential Nature of Medicine)</td>
<td>Zhen Ning (1545)</td>
<td>Salty, cooling and no toxicity</td>
</tr>
<tr>
<td><em>Yangsheng siyao</em> (Four Essentials of Nourishing Life)</td>
<td>Wan Mizai (1549)</td>
<td>Salty, neutral</td>
</tr>
<tr>
<td><em>Yixue rumen</em> (Introduction to Medical Studies)</td>
<td>Li Yan (1575)</td>
<td>Salty, no toxicity</td>
</tr>
<tr>
<td><em>Bencao gangmu</em> (Systematic Materia Medica)</td>
<td>Li Shizhen (1578)</td>
<td>Salty, warming and no toxicity</td>
</tr>
<tr>
<td><em>Leigong paozhi yaoxingjie</em> (Annotations on the Properties of Master Lei’s Drug Processing)</td>
<td>Li Zhongzi (1622)</td>
<td>Salty, slightly cooling, no toxicity</td>
</tr>
<tr>
<td><em>Bencao hui</em> (Collections on Materia Medica)</td>
<td>Guo Peilan (1655)</td>
<td>Salty and warming</td>
</tr>
<tr>
<td><em>Woling bencao</em> (Holding Efficacious Materia Medica)</td>
<td>Wang Hong (1682)</td>
<td>Salty and warming, no toxicity</td>
</tr>
<tr>
<td><em>Bencao beiyao</em> (Essentials on Materia Medica)</td>
<td>Wang Ang (1694)</td>
<td>Salty and warming</td>
</tr>
<tr>
<td><em>Yaoyao fenji</em> (Classified Essential Drugs)</td>
<td>Shen Jinao (1773)</td>
<td>Salty and warming, down, no toxicity</td>
</tr>
<tr>
<td><em>Bencao zeyao gangmu</em> (Selected Essentials on Systematic Materia Medica)</td>
<td>Jiang Jiefan (1810)</td>
<td>Salty, cooling and no toxicity</td>
</tr>
<tr>
<td><em>Liaofu ji</em> (Collections of Liaofu)</td>
<td>Wang Bichang (1810)</td>
<td>Salty, warming and no toxicity</td>
</tr>
<tr>
<td><em>Bencao fenjing</em> (Discussions on Materia Medica by Meridian Vessels)</td>
<td>Yao Lan (1840)</td>
<td>Salty, neutral</td>
</tr>
<tr>
<td><em>Bencao zaixin</em> (Renewed Materia Medica)</td>
<td>Ye Gui (1841)</td>
<td>Salty, neutral and no toxicity</td>
</tr>
<tr>
<td><em>Bencao cuoxiao</em> (Synopsis of Materia Medica)</td>
<td>Chen Qirui (1886)</td>
<td>Salty</td>
</tr>
</tbody>
</table>

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64 The author Ye Gui is a homonym of the famous scholar Ye Gui (1667-1746), best known as Tianshi (Tianshi being his courtesy name). The confusion probably arose from the fact that the booksellers put Ye Gui’s or Ye Tianshi’s name on *Bencao zaixin*. See Long (1957), p. 81.
Furthermore, the functions and indications of qiushi correlated with its preparation methods, and physicians had their own preferences. In the *Complete Orthodox Tradition of Medicine, Ancient and Contemporary*, completed in 1556, Xu Chunfu 徐春甫 (1520-1596) states that the flavor of qiushi prepared by heating is saltier than that of qiushi prepared without heating; the former therefore had the function of resolving phlegm and the latter that of tonifying.  

However, Chen Jiamo 陈嘉謨 (1486-1570) recommends preparing qiushi with gypsum, autumn dew and urine without heating. He believed that this type of qiushi more effectively nourished yin and moistened the lungs, because gypsum helped the vitality in the urine to precipitate, while autumn dew had the quality of cooling. A typical example from the *Four Essentials for Health Preservation* states that qiushi prepared by any method other than the one it gives would contain fire toxins or be dirty. The only proper method was to collect the sediment on the surface of a cloth after the urine had evaporated naturally. Some physicians recommended combining qiushi drugs prepared using different methods, and others preferred to prepare qiushi without heating. Chen Jiamo even suggested that the patient take qiushi prepared by the opposite sex.

Like books on materia medica, which focus primarily on medical theories about the drug, classical formularies and medical cases are also concerned about its practical use. A formula is a standard method that a physician learns from a book or a teacher. It may involve therapies other than drugs. By searching medical books written from the Song to the Qing, I found 18 formulas in 9 medical books in which qiushi was a single drug, and 157 compound formulas containing qiushi in 87 books. In the single formulas, qiushi is used to treat leucorrhoea diseases, chronic cough, seminal emission, abdominal distension and consumptive disease caused by excessive lust at a young age. Furthermore, both the types of, and symptoms treated by, these 157 formulas vary widely across time (see Table 3 on the following page). Of the fifteen formulas prescribed during the Song and Yuan periods, fourteen were used to cure illness and one to maintain health. 89 new formulas appear in the Ming, 40 of which were used for health maintenance. Six formulas were for external use, such as treating eye disease and aphtha.

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65 Gujin yitong daquan, chap. 97, pp. 1290-1291.
66 Bencao mengguan, chap. 12, pp. 5-6.
67 Yangsheng siyao, chap. 4, p. 16.
### Table 3. Types of formulas containing *qiushi* by dynasty

<table>
<thead>
<tr>
<th>Dynasty</th>
<th>Number of formulas</th>
<th>Purpose</th>
<th>Intended use</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Curing disease</td>
<td>Health maintenance</td>
</tr>
<tr>
<td>Song</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Yuan</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Ming</td>
<td>89</td>
<td>49</td>
<td>40</td>
</tr>
<tr>
<td>Qing</td>
<td>53</td>
<td>49</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>157</td>
<td>112</td>
<td>45</td>
</tr>
</tbody>
</table>

The diseases or symptoms associated with the *qiushi*-containing formulas vary by category and period. They are used as tonic formulas and to treat strangury in the Song, while in the Yuan they were used to treat debilitation, obstinate colds and feelings of body swelling. Many new formulas appear in the mid-Ming, especially between 1573 and 1620. 68 new formulas are listed under the categories of tonic, lumbar pain, dyspnea syndrome or cough. In the Qing, *qiushi* was primarily used to treat coughs, hemoptysis, aphtha, smallpox, and gum abscesses, or was used as a substitute for table salt.

Based on the materia medica books and classical formularies studied, it is clear that, in Chinese medical history, *qiushi* was used to treat a wide variety of diseases, and that its main use was not as an aphrodisiac or to cure impotence and other sexual disorders or hypogonadal conditions. This is reinforced by historical medical case records prescribing *qiushi*. Some physicians considered *qiushi* a tonic drug because of its warming activity; tonics can have a strengthening effect and may therefore indirectly treat sexual debility and related disorders. However, only two medical books written during the Ming ascribe to *qiushi* the function of tonifying yang and curing atrophy-flaccidity disease, a symptom of sexual debility. However, most physicians in the Song and Ming argued that *qiushi* prepared via heating contained more cooling activity than warming, and they preferred *qiushi* prepared without heating and therefore without neutral or cooling activity. From this perspective, tonifying yang and curing atrophy-flaccidity disease were merely two of *qiushi*’s many functions, and not particularly important ones.

In sum, from the perspectives of both the Chinese medical tradition and its chemical constituents, *qiushi* does not have aphrodisiacal properties and its main functions are not the treatment of impotence and other sexual disorders.

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68 *Yixue rumen*, p. 393; *Dong-ui bogam*, chap. 9, p. 600.
Efficacy, ritual, alchemy, politics and the public

The prevailing view has been that *qiushi* was frequently used because it contained sex hormones and that it functioned as an aphrodisiac. However, reconstruction experiments revealed that most preparation methods produce *qiushi* that contains no active hormones, or such a low percentage of testosterone that it would have no effect. Why, then, was *qiushi* frequently used in China, enjoying especial popularity in the Ming period? Why do the functions of *qiushi* differ across periods? What does efficacy mean in the Chinese medical tradition?

Many medical records mention *qiushi*: one from the Song period, ten from the Ming and 107 from the Qing. These record the symptoms of the patients in detail and then give a formula. However, most physicians simply wrote that the patients recovered after taking the drugs, and few medical records describe the patients’ response or subjective experience after the therapy, even in the simplest terms. The records of the treatment process are also not detailed. The few records that patients kept of their own therapy are so lacking in detail that it is impossible to compare accounts of the doctor’s and the patient’s perceptions. Although we know the chemical constituents of *qiushi* through reconstruction experiments, modern knowledge cannot clarify the ambiguity of ancient records. Thus, modern knowledge offers few clues to the effectiveness of *qiushi* in practical use.

Daniel Moerman has proposed that a combination of three responses explains the use of any therapy in any time or place: the body’s autonomous ability to recover; its specific response to biological, chemical, and physical agents; and the individual’s responses to symbolic activity or interactions with other people. 69 Considering that the placebo effect includes much that has nothing to do with placebos and ignored the clinical encounter and individual healing process, Moerman introduced the term ‘meaning response’ to cover the personal meaning of the circumstances to the patient and a broad range of additional human experiences. 70

I will discuss the efficacy of *qiushi* from the perspective of physicians, discussing their relationship to alchemy with respect to social status, their theoretical judgment and practical actions, how they evoked and supported the ‘meaning response’ and the autonomous response of the patients, and how they responded to therapeutic success. As I shall show, drug therapy evolved through a process that reflected the social character of traditional medicine in China, and indicates that social factors affected the content of the Chinese medical tradition, as they affect every kind of medical practice.

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The uses of *qiushi* and the social status of alchemy and physicians

I have argued above that the origin of *qiushi* as a drug is closely related to the tension between external alchemy and internal alchemy. The earliest extant description of *qiushi* prepared from urine and the oldest extant record of *qiushi* in Chinese materia medica are both from the Northern Song period. However, why would classical physicians at that time accept a drug that originated from alchemy, and why were so many preparation methods and new formulas developed? The relative social status of alchemists and physicians may provide answers.

During the Northern Song, doctors and other scholars synthesized, for the first time in a millennium, disparate earlier approaches to diagnosis and therapy. They enriched these methods with others adapted from popular, Buddhist, and Daoist health practices. In *Good Formulas*, Shen Kuo described the efficacy of *qiushi*, using himself, his father and his father’s friend Lang Jian as examples, mentioning as well several more mysterious sources. He wrote that his father, who had suffered from emaciation for nine years, recovered by taking *qiushi*. Lang Jian dreamed that he received ten pills of *qiushi* from a devotee of the Way (*daoren* 道人); upon awaking, he found ten pills similar to those he had dreamed about. Lang Jian’s wife recovered after taking the pills. Furthermore, Shen mentioned that the recipe for preparing *qiushi* was obtained from a Daoist (*daoshi* 道士), Fang Xu. Shen Kuo was an important official and a widely read author; although he wrote with acuity on medicine, he never supported himself by medical practice. After the eleventh century, due to the promotion of medicine by emperor Huizong (r. 1100-1126), large numbers of elite men entered therapeutic careers, frequently occupying positions of prestige. Thus, *qiushi*, with its religious and popular elements, came into classical medicine, and doctors reinterpreted popular and religious ideas as they applied them. They translated religious and vitalistic notions into their own abstract conceptual language, which reflected their explanations of why *qiushi* is prepared from urine.

The religious element also explains *qiushi*’s continuous use, in addition to the changing social status of alchemy. The printing boom of the Wanli reign-period (1573-1620) coincided with renewed interest in internal alchemy among elites. The preparation and use of *qiushi* were highly popular in the middle and late Ming periods. I discovered 98 new formulas containing *qiushi* in the texts of this period, and 15 formulas that had names derived from alchemy, such as Secretly Taught Elixir For Immortals to Prolong Life (*michuan shenxian yanshou dan* 秘傳神仙延壽丹). The benefits of *qiushi*—prolonged life and health maintenance—were greatly emphasized during this period. Sun Yikui 孫一奎 (1522-1619) recorded 9 new and

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different methods for preparing qiushi in his Occult Pearls from the Red River. He also proposed that qiushi is a special elixir from the human body, because urine is formed from the spirit, $qi$, and vitality of humans. Therefore, the donors of urine should be young boys or girls, because both yin $qi$ and yang $qi$ exist in their bodies.\textsuperscript{72} The book Complete Remarks on Fivefold Happiness considered young boys and girls as reaction vessels, like the body of adepts in the practice of internal alchemy. Some doctors even mention Daoist classics when explaining the theory governing the preparation of qiushi.\textsuperscript{73} I have been unable to locate any records about the price of qiushi and where it was sold.

A rapid rise in preparation methods appears from Ming dynasty (see Figure 1 above). Eight different preparation methods were recorded in the Song and Yuan periods. In the Generally Helpful Formulas (Pu ji fang普濟方), a large-scale formula collection, there were three preparation methods, which had few differences in processing from the earlier ones. From 1520 to the end of Ming, 89 new methods were recorded in different medical books. Studies on the history of the book and book culture have shown that woodblock printing, the plain language that made the books attractive to a broad readership,\textsuperscript{74} along with the circulation of certain popular medical manuals or guides, attracted both a professional and a popular audience.\textsuperscript{75} Thus, print culture was very important in the Ming and Qing for helping the circulation of knowledge of making and using qiushi, especially to ordinary people. However, the new preparation materials, tools, equipment and procedures for making qiushi, and the compositions of the formulas in the Ming dynasty (especially from mid-Ming on) varied widely, and were very different from those of earlier times. The first category of preparation methods in which gypsum was used appears in 1565 in Bencao mengquan 本草蒙筌 (Enlightening Beginners about Materia Medica).\textsuperscript{76} The fourth category of making qiushi appears in 1573 in Chishui xuanzhu.\textsuperscript{77} These preparation methods and formulas were not simply copied from earlier texts or had a few modifications. In contrast, in Pu ji fang of 1406 there were three preparation methods, which had few differences in processing with those from the Song dynasty. In the Qing dynasty, preparation methods returned to fewer requirements for the collection of urine and heating furnaces.

\textsuperscript{72} Chishui xuanzhu, chap. 10, pp. 82b-83a.
\textsuperscript{73} Wufu quanshu, chap. 4, p. 14.
\textsuperscript{74} Brokaw (2005).
\textsuperscript{75} Brokaw (2007), pp. 428-435. Medical works constituted an important staple of commercial publishers in both Ming Nanjing and Jiangyang; see Chia (2005).
\textsuperscript{76} Bencao mengquan, chap. 12, pp. 5-6.
\textsuperscript{77} Chishui xuanzhu, chap. 10.
In addition to its ritual and religious functions, qiushi affected social relationships among both officials and the public during the Ming period. Gu Kexue 顧可學 (1482-1560), a private physician, was promoted to a high official post, Minister of Rites (Libu shangshu 礼部尚書), after preparing qiushi for the Jiajing emperor, who is known to have been a great patron of Daoism, and was obsessed by the idea of seeking the elixir of life. Gu was also responsible for Daoist rituals and building a temple. In the Jiajing reign-period, the palace chef cooked everything with qiushi. Shen Defu 沈德符 (1578-1642) claimed that qiushi and hongqian 紅铅 (literally, ‘red lead’) were the cause of political change in the mid-Ming period. Hongqian was a medicine made from the menstrual blood of young women. It is recorded that the Wanli emperor died after taking a red pill made from hongqian, qiushi and human milk in 1620.

The ritual matrix and the dimension of imagination in drug therapy

I have already discussed the substantial magical and ritual content of qiushi preparation, especially during the middle and late Ming periods, when internal alchemy affected classical medicine. The religious rituals associated with the preparation of qiushi influenced physicians’ judgments, and their symbolic import increased the efficacy of qiushi. As a result, people believed that qiushi produced therapeutic success.

Urine is of human origin; therefore, ritual and magic are associated with it to a greater degree than with most drugs of vegetal, mineral, or lower animal origin. Religious therapy had something in common with the

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78 Mingchao xiaoshi, chap. 12.
79 During the Jiajing reign-period, some Confucian officials, such as Gu Kexue, Sheng Duanming 盛端明, and Wang Jin 王金, attained official promotions by mastering Daoist techniques. Others were executed because they criticized the imperial favor granted to Daoists. All this reveals how deeply political life under Shizong was influenced by politically active Daoists and matters of magic. See Debruyne (2000).
80 Ming shi, chap. 307, pp. 36a-38a; Boluo xianzhi, chap. 13.
81 Yangsheng fu yu, p. 7.
82 Wanli yehuo pian, vol. 2, pp. 546-547.
83 The emperor felt much better after taking a red lead pill, regained his appetite, and repeatedly praised Li Kezhuo 李可灼, its maker. That same afternoon, the emperor took a second pill and was found dead the next morning. The death of an emperor who was seemingly in good health sent shock waves (and rumors) through the Ming empire. The much-talked-about mystery surrounding Guangzong’s death became infamous as the “Case of the Red Pills.” See Ming shi, chap. 21, p. 15b-16b; Ming shi jishi benmo, chap. 68, p. 14a-17b.
classical medicine of the scholarly doctors. Qi was not a purely medical concept, but one of the universal bases of Chinese thought, and thus religious treatments were also based on it. In the Ming, the idea that urine preserves the body's innate primordial qi (yuanqi 元氣) prevailed. Religious therapy also considered the body as a microcosm, and the qi in the urine of young boys and girls could aid the body's readjustment to harmony and balance. After preparation by heating, stirring with saponin or gypsum, or exposing the mixture to the sun or moon, the vital qi in urine could be greatly increased.

In addition to the ritual matrix of preparing and taking qiushi, one can find many ritual elements when people gathered, bought, processed, compounded and administered the drug. The ‘meaning response’ explains how the medical and the religious related. When some classical physicians took religious healing seriously, they noticed the perceptible role in recovery played by patients’ responses to meaningful events. Medical authors, as they responded to the therapeutic success of ritual, translated its popular rationale into their own cosmology. After accepting qiushi of religious origin, reinterpreting it to fit their own rituals, and assimilating it to classical theory, classical physicians were indeed curing diseases using their principles. The doctor as cosmologist thus evoked the ‘meaning response’ in patients.

For patients, the ritual content of the complex preparation methods and strict requirements for urine collecting evoked a ‘meaning response’ whether they participated in preparing qiushi or simply knew something about the process. According to Shen Kuo, many people knew how to prepare qiushi by heating urine, and the bad smell spread even to distant neighborhoods. Even if commoners or patients did not participate in preparing qiushi, they witnessed rites performed when taking qiushi. One such involved combining qiushi and the milk of a woman who had a male child, drying it in the sun on a clear day, then repeating this process 9 times to absorb the energy of the sun. Interestingly, a medical formula mentioning qiushi was found on the fortune-telling lots of the Qingshui Temple in Taiwan. The meanings embedded in the ensuing ritual and the use of religious symbols associated with religion strengthened the patient’s will and ability to recover. The changing nature of the rituals and interpretations of qiushi increased both patients’ and physicians’ belief in its efficacy. This is another aspect of the ‘meaning response.’

85 Their date is unclear. The jotting was collected by the National Taiwan University Library in 1936.
The division between theory and practical use

There was no dichotomy between medical theory and practice in imperial China. Most medical authors treated patients using the classics they had memorized, as well as later formularies, as guides. Such was also the case for the medical use of qiushi. Using classical theory, doctors first interpreted the nature and sapidity of qiushi, and then its therapeutic function in materia medica books and formularies. Thus theory and practical use coexisted in the case of qiushi.

Physicians offered various interpretations of the ‘nature’ and ‘sapidity’ and, consequently, the functions, of qiushi that differed according to its preparation methods. Some physicians preferred the yin purification method while others preferred the yang purification method. Physicians in the Ming dynasty invented many new and complex preparation methods. I seldom found physicians emphasizing a specific way to prepare qiushi when they prescribe or mix the formulas or make a compound using qiushi. The closest thing to an exception is a formula for a qiushi pill (qiushi wan 秋石丸), which stipulates that qiushi prepared using different methods should be taken separately.86

Many texts criticized preparations of qiushi for violating restrictions or for preparing qiushi from salt instead of urine. In the Ming, many physicians expressed disappointment that the urine was not collected from young boys or girls, but from all types of people;87 they lamented that the qiushi sold in drug stores was typically prepared according to a method using heating because methods that did not involve heating were too complicated.88 In the Southern Song, Chen Yan 陳衍 criticized ‘vulgar’ people for preparing qiushi from salt; the product had the same appearance and color as qiushi, but it had a bitter and salty flavor that would harm a person with a cough and swelling.89 Physicians in the sixteenth century offered similar criticisms.90 Zhang Lu 張璐 (1617-1699) provided several detailed ways to distinguish authentic qiushi from fake. He noted that it was extremely difficult to obtain authentic qiushi prepared from urine instead of salt unless you hired someone to supervise the process.91 In the late Qing, as fake qiushi became more common in drug stores, some authors considered qiushi prepared with salt authentic.

The state and the public differed on the practical use of qiushi. The official histories, personal literary collections, and compendia of jottings

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86 Pu ji fang, chap. 222, p. 39b.
87 Bencao mengguan, chap. 12, pp. 5-6.
88 Bencao fangyao canyao, chap. 9, p. 65.
89 Baoqing bencao zhezhong, p. 110.
90 Bencao gangnu, chap. 52, p. 19a-19b.
91 Benjing fengyuan, chap. 4, p. 119.
agree that qiushi was very valuable. The literati and commoners valued qiushi’s health-promoting properties as well as the ability to prolong life that motivated state officials. The literati prepared qiushi by heating the urine themselves and sending it to friends, who considered it a precious gift. They used qiushi as an alternative to salt for people with swellings who should not eat salt. Skilled cooks stewed meat with qiushi since they thought qiushi softened tough meat. It was widely used as a medicine to cure eye disease for soldiers during a revolt in 1631. Many soldiers suffered night blindness (que gu, blind as sparrow at night), possibly because they had no source of iodine.

Conclusion

I have discussed why qiushi was prepared from urine and used as a drug, how qiushi was prepared, the practical uses of qiushi and why it was frequently used in China, especially in the Ming dynasty. What is striking about qiushi is the great temporal and spatial range in which powerful individuals and significant social phenomena interacted with it. The example of qiushi suggests that to use biomedical knowledge productively, it is essential to first understand the object of study on its own terms. The history of qiushi can only be fully understood when we are aware of its many dimensions, including the public and state, elites and ordinary people, and ritual and belief. Compared to the modern notion that qiushi contains sex hormones, this picture of qiushi is more accurate and more revealing. The popular, centuries-long use of qiushi correlates with the efficacy of the ‘meaning response,’ the merging of alchemy and medicine, the influence of social relations, and the division and mixture of theory and practical use.

The complexity of classical medicine lies not only in the mixtures of ingredients, tailored to a patient, that work synergistically, and in the different systems of concepts and understanding of the body, but also in the social relations that affect drug therapy and use. The case of qiushi inspires us to think further whether the modernization of traditional Chinese medicine requires learning not only from modern health care but also from historic Chinese culture.

92 Yangsheng siyao, chap. 4, p. 16.
93 Xiangyu ji, chap. 33.
94 Fei yin yu zhi lu, p. 80a-80b.
95 Shi kui shu houji, chap. 35. The iodine in iodized salt prevents night blindness, etc.
References

Traditional Works in Eastern Asian Languages


Beiji qianjin yao fang 備急千金要方 (Revised Formulas Worth a Thousand Ounces of Gold, for Every Urgent Need), Sun Simiao 孫思邈, 650/659; in Duan Yishan 段逸山 (ed.), Beiji qianjin yao fang tongjian 備急千金要方通檢 (Index for Revised Formulas Worth a Thousand Ounces of Gold, for Every Urgent Need), Shanghai: Shanghai cishu chubanshe, 2010.


Bencao fenjing 本草分經 (Discussions on Materia Medica by Meridian Vessels), Yao Lan 姚瀾, 1840; Shanghai: Shanghai kexue jishu chubanshe, 1989.

Bencao gangmu 本草綱目 (Systematic Materia Medica), Li Shizhen 李時珍, compiled 1552-1593, printed 1596; Yingyin Wenyuange Siku quanshu 影印文淵閣四庫全書, vol. 772-774, Taibei: Taiwan shangwu yinshuguan, 1983.

Bencao jing yizhu 本草經集注 (The Heavenly Farmer’s Canon of Materia Medica, with Collected Annotations), Tao Hongjing 陶弘景, 500 CE; Shang Zhijun 尚誌鈞 and Shang Yuansheng 尚元勝 eds., Beijing: Renmin weisheng chubanshe, 1994.

Bencao mengquan 本草蒙筌 (Enlightening Beginners about Materia Medica), Chen Jiamo 陳嘉謨, 1565; Xuxiu siku quanshu 續修四庫全書, vol. 991, Shanghai: Shanghai guji chubanshe, 1995.

Bencao zaixin 本草再新 (Renewed Materia Medica), Ye Gui 葉桂, 1841; Shanghai: Shanghai qunxue shushe, 1919.

ZHU: ELIXIR, URINE AND HORMONE

Boluo xianzhi 博羅縣誌 (Boluo Country Gazetteer), Chen Yiyu 陳裔虞, compiled in the Qianlong 乾隆 reign-period (r. 1736-1795); Zhongguo difangzhi jicheng 中國地方誌集成, vol. 16, Shanghai: Shanghai shudian chubanshe, 2003.

Chishui xuanzhu 赤水玄珠 (Occult Pearls from the Red River), Sun Yikui 孫一奎, 1573; Yingyin Wenyuange Siku quanshu 印因文語閣四庫全書, vol. 766.

Danfang jianyuan 丹方鑒原 (The Original Mirror of Alchemical Prescriptions), Dugu Tao 獨孤滔, 836; in Dao Zang 道藏, Beijing, Wenwu Chubanshe / Shanghai, Shanghai Shudian / Tianjin, Tianjin Guji Chubanshe, 1988), S925, DZ596. [Here and below, S refers to title number in Kristofer M. Schipper (1975), Concordance du Tao-tsang. Titres des ouvrages, Paris: École Française d’Extrême-orient, and DZ refers to volume number in Zhengtong Daozang 正統道藏 of 1145 or 1146.]

Danlun juezhi xinjian 丹論決旨心鑒 (Mental Mirror and Directions Regarding Discourses and Explanations on the Elixir), Zhang Xuande 張玄德, written in Five Dynasties (907-960); S935, DZ598.

Dong-ui bogam 東醫寶鑑 (Treasured Mirror of Eastern Medicine), Heo Jun 許浚, 1613; Beijing: Renming weisheng chubanshe, 1982.

Fei yin yu zhi lu 費隱與知錄 (Dialogues on Partaking in Widely Applicable but Hidden Knowledge), Zheng Fuguang 鄭復光, 1842; Shanghai: Shanghai kexue jishu chubanshe, 1985.

Gujin yitong daquan 古今醫統大全 (Complete Orthodox Tradition of Medicine, Ancient and Contemporary), Xu Chunfu 徐春甫, 1556; vol. 2, Hefei: Anhui kexue jishu chubanshe, 1995.

Hou Han shu 後漢書 (History of Eastern Han Dynasty), main text completed c. 450 CE, monographs by Sima Biao 司馬彪 (c. 240-c. 306 CE) added later, Fan Ye 范曄 (398-445 CE); Beijing: Zhonghua shuju, 1965.


Jiyang gangmu 濟陽鋼目 (Synopsis of Treating Man’s Diseases), Wu Zhiwang 武之望, 1626; in Jiyin jiyang gangmu (Synopsis of Treating
Woman’s and Man’s Diseases), Beijing: Zhongguo zhongyiyao Chubanshe, 1996.

Leigong paozhi yaoxing jie 雷公炮炙藥性解 (Annotations on the Properties of Master Lei’s Drug Processing), attributed to Li Zhongzi 李中梓, but probably compiled by a publisher after 1629; Zhongguo yixue dacheng 中國醫學大成, Shanghai: Shanghai kexue jishu chubanshe, 1990.

Longhu huandan ge 龍虎還丹歌 (A Song on the Dragon and Tiger Cyclically Transformed Elixir), commentary by Li Zhenren 李真人, written in Northern Song (960-1127); S1084, DZ741.

Longhu yuanzhi 龍虎元旨 (Basic Directive on the Dragon and Tiger), attributed to Qingxia zi 青霞子, written in ninth century or later; S1083, DZ741.

Mingchao xiaoshi 明朝小史 (Brief History of Ming Dynasty), Lü Bi 吕毖, 1644; Siku jinhui shu congkan 四庫禁毀書叢刊, part shi 史部, vol. 19, Beijing: Beijing chubanshe, 2000.

Ming shi 明史 (History of Ming Dynasty), compiled by Zhang Tingyu 張廷玉 et al., 1739; Yingyin Wenyuange Siku quanshu 聖經文獻館四庫全書, vol. 302.

Sheng ji zong lu 聖濟總錄 (General Record of Sagely Benefaction), Shen Fu 申甫 et al., compiled by order of emperor Huizong, 1117; Beijing: Renmin weisheng chubanshe, 1962.

Shi kui shu houji 石匱書後集 (Supplemental Collection of Shikui), Zhang Dai 張岱, completed in the late Ming period; Shanghai: Shanghai guji chubanshe, 2008.

Su Shen liangfang 蘇沈良方 (Superior Formulas by Su & Shen), Su Shi 蘇軾 and Shen Kuo 沈括, anonymously compiled, 1141/1151; combines Shen’s Liangfang with some unpublished medical writings by Su; Yingyin Wenyuange Siku quanshu 聖經文獻館四庫全書, vol. 738.

Wanli yehuo pian 高曆野獲篇 (An Official History of Wanli Period), Shen Defu 沈德符, completed in 1606-1607; Beijing: Zhonghua shuju, 1959.
Wufu quanshu 五福全書 (Complete Writings on Fivefold Happiness), Gong Juzhong 龔居中, 1630; Jianyang Qiaoshantang Liu Kongdun 建陽喬山堂劉孔敦 edition; Peking University Library.

Wushier bing fang 五十二病方 (Fifty-two Kinds of Diseases and Recipes), Compilation Group of Texts at Mawan ed., completed between 206 BCE and 8 BCE; Beijing: Cultural Relics Publishing House, 1979.

Wu za zu 五雜組 (Five Assorted Offerings), Xie Zhaozhe 謝肇淛, 1616; Xuxiu siku quanshu, vol. 1130.

Wuzhenpian zhusu 悟真篇注疏 (Commentaries on the Essay on Awakening to Realization), written by Zhang Boduan 張伯端 (984-1028), annotated by Weng Baoguang 翁葆光, subcommentary by Dai Qizong 戴起宗; S141, DZ61-62.

Xiangyu ji 香宇集 (Fragrance House Collection), Tian Yiheng 田藝衡, Second collection, printed between 1522 and 1566; Xuxiu siku quanshu, vol. 1354.

Xishanqunxian huizhen ji 西山群仙會真記 (Record of the Immortals of the Huizhen (Hall) on Xishan), attributed to Shi Jianwu 施肩吾, compiled by Li Song 李煉, Northern Song (960-1127); S246, DZ116.


Xuan jie lu 懸解錄 (Record of an Explication of the Mysteries), anonymous, preface dated 855; S928, DZ597.

Yaoxing tongkao 藥性通考 (General Examination of the Properties of Drugs), Liu Hanji 劉漢基 et al., completed mid-nineteenth century; Xuxiu siku quanshu, vol. 994.

Yi bian 醫便 (Convenience in Medicine), Wang Junshang 王君賞 and Zhang Yuanwen 張遠文, 1569; Shanghai: Shanghai guji chubanshe, 1984.

Yin zhenjun jinshi wuxianglei 陰真君金石五相類 (The Fivefold Classification of Metals and Minerals of the True Gentleman Yin), attributed to Yin
Changsheng 陰長生 (Western Han period, 206 BCE-9 CE), probably written between 686 and 960; S906, DZ 589.

Yixue rumen 醫學入門 (Introduction to Medical Studies), Li Chan 李梴, preface 1575; Nanchang: Jiangxi kexue jishu chubanshe, 1988.

Yunji qiqian 雲笈七簽 (Seven Slips from the Bookbag from the Clouds), Zhang Junfang 張君房, completed before 1029; Jinan: Qilu shushe, 1988.

Zhenyuan miaodao yaolue 真元妙道要略 (Essential Outline of the Marvellous Way of the Authentic Origins), attributed to Zheng Siyuan 鄭思遠, between 940 and 1010; S924, DZ596.

Zhouhou beiji fang 軟後備急方 (Handy Therapy for Emergencies), written by Ge Hong, ca. 340 CE; revised by Tao Hongjing 陶弘景, and Yang Yongdao 楊用道; reprint of 1574; Beijing: Renmin weisheng chubanshe, 1954.

Zhouyi can tong qi 周易參同契 (Token for the Agreement of the Three According to the Book of Changes), attributed to Yin Changsheng 陰長生 (an immortal of the Western Han period, 206 BCE-9 CE), completed in Tang (618-907); S999, DZ621.

Zunsheng bajian 遵生八箋 (Eight Disquisitions on Respect for Life), Gao Lian 高濂, 1591; Yingyin Wenyuange Siku quanshu, vol. 871.

Secondary Sources in Western and Eastern Languages


Long Bojian 龍伯堅 (1957), Xiancun bencao shulu 現存本草書錄 (The Records on Extant books of Materia Medica), Beijing: Renmin weisheng chubanshe.


Yang Cunzhong 楊存鍾 (1977), “Shijieshang zuizao de tiqu yingyong xingjisu de wanbei jizai” 世界上最早的提取、應用性激素的完備記載 (The Earliest Complete Record in the World about Extraction and Use of Sexual Hormone), *Huaxue tongbao 化學通報* (Bulletin of Chemistry) 4: 59, 64.


Zhang Xianqing 張顯清 (1992), *Yan Song zhuan 嚴嵩傳* (Biography of Yang Song), Hefei: Huangshan shushe.


Zhu Jing 朱晶 (2012a), “Qiushi mingcheng kao” 秋石名稱考 (Studies on Different Names of Qiushi), *Qinghuadaxue xuebao (zhexue shehui kexue ban)* 清華大學學報 (哲學社會科學版) (Journal of Tsinghua University (Philosophy and Social Sciences)) 27.3: 145-154.
