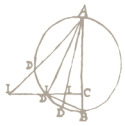

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Accounting for Uncertainty: Prediction and Planning in Asian History

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Prediction and Planning in Asian History

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Introduction: Predicting and Planning: Reifying Knowledge and Realizing the Future

Dagmar Schäfer[1], Zhao Lu[2], Michael Lackner[3]

The fundamental human condition of unknowingness and uncertainty has produced a variety of ways of thought modelling and reasoning throughout history and cultures. How East Asian cultures between the first to twentieth century CE approached such issues was the theme of a collaborative project between the Max Planck Institute for the History of Science, Berlin (Department III, Artifacts, Action, Knowledge, Director: Prof Dagmar Schäfer) and the International Consortium for Research in the Humanities "Fate, Freedom, and Prognostication—Strategies for Coping with the Future in East Asia and Europe" at the Friedrich-Alexander University Erlangen-Nuremberg (Director Michael Lackner, Researcher Zhao Lu). Over two summer terms between 2015 and 2016 six researchers explored the diverse methods and rationalities, as well as the material tools that historical actors employed to predict the future and then plan for it. In collaborative meetings the group developed insights into the historical terminology and dynamics revolving around uncertainty, generating this glossary.

The collaborative project focused on the ways that factual knowledge and divinatory conclusions were irrevocably bound up with the processes from which they were produced, how and in which situations people legitimized the process of predicting or planning via divination, and the empirical acquisition of knowledge through factual data or by way of culturally-sanctioned reasoning. The group was also concerned with how the power or practices of standardization impacted on validity, and the role played by visual and material practices as explanatory and *explanans*. Within Chinese and Japanese history, the project members tackled cases that addressed individual struggles with planning for the present and the future, actual and envisioned tasks when managing everyday life, as well as family planning, the environment, as well as social or political issues. In every case, they found that actors

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had employed distinctive conceptual frameworks and a diversified nomenclature to account for uncertainty, whilst determining which factors needed to be reliable—thus determined and fixed—and which could be left untouched, remain undocumented, or flexibly handled in each situation.

In contrast to knowledge and beliefs, the historical development of concepts and practices of unknowingness and uncertainty has hitherto received little attention in research on scientific, technological, intellectual or political change.[4] Like many others, concepts and methods of handling uncertainty in Asian cultures included astrological and astronomical means, calculus, moral reasoning, empiricism and abstraction. Elites and scholars developed distinct theories and practices around uncertain themes, from physiognomic methods of divination to sophisticating the nomenclature of uncertainty and doubt, contingency or inevitabilities. Frequently, however, actors at the time simply developed and recorded social strategies to cope with diverse experiences. We can see a wide range of theories, practices, and social strategies applied in coping with disasters such as earthquakes or locust plagues, events like childbirth, or the incalculable results of civil service exams.

This glossary of uncertainty, is closely connected to the project's six specific case studies. Unlike other 'glossaries', however, this one defies an alphabetical order. Moreover, considering that people dealt with uncertainty both on a conceptual level as well as through practice, our glossary includes both terminology and empirical reference points. All members of the group responded to a standardized questionnaire and addressed 1.) the historical social background for each entry to the glossary; 2.) the relation between the glossary entry and prediction and planning; 3.) reflected on the terms and described events from both the actor's (etic) and analyst's (emic) point of view. The authors were asked to examine how emic terms are connected to practice and demonstrate their relation to planning or prognostication. In addition, authors query how these emic terms are related to each other, if at all. And finally, a definition

[4] For the first exploration of the historical side of uncertainty in scientific practice and concept formation see Boumans/Hon/Petersen, *Error and Uncertainty.* Boumans and Hon link uncertainty in the European science to debates around error, see Boumans/Hon, "Introduction." This connection is also drawn in Chinese thought, especially with regard to philological methods. For an examination of error in early Chinese thoughts on the observation of phenomena, see Fraser, "Knowledge and Error."

of the corresponding etic concepts may be outlined, specifying the differences or relationships between the emic and etic terms, and adding primary and secondary sources.

The function of the glossary is twofold: Firstly, it provides an insight into diverse uncertainties and coping methods that were historically discussed and practiced in China and Japan. By offering not only the terms but also the conceptualizations and primary sources, we hope to grant researchers in-depth information to carry out further research. Secondly, and more importantly, this glossary is an open invitation to expand research into uncertainty across cultures and historical periods, into both scientific and practical activities. We hope to encourage comparison between different epistemologies and methodologies of treatments of uncertainty, unknowingness, or indecisiveness.

East Asia and Uncertainty: Politics and History

Uncertainty has been a substantial topic of scholarly and political studies in Asian history, as shown by research into divinatory techniques such as oracle bones and other excavated artifacts. Both in Chinese and Japanese history, divination and diviners played a major role in the societies. On the institutional level, the state trained diviners and produced divinatory, especially astrological, knowledge to monitor their dynasties and their future. From second century BCE to the thirteenth century CE, Chinese emperors institutionalized the Grand Historian (*Taishi ling* 太史令); from the seventh to ninth century CE, Japanese rulers relied on the Institute of Divination (*Onmyōryō* 陰陽寮). Diviners (*buren* 卜人; *Onmyōji* 陰陽師) also operated on the individual level, both in traditional China and Japan, helping villagers as well as aristocrats to decide on marriage, sickness, travel, etc. up until the modern days. Regardless of historical periods, when there is uncertainty, there is planning and prediction and then there is divination[5] or other technical means.

Written sources of pre-imperial and imperial eras reveal that throughout history uncertainty has been central to politics and historical accounts and thus intricately

[5] For divination in China and Japan, see, for example, Beinorius, "On the Religious and Cultural Aspects"; Raphals, *Divination and Prediction*; Smith, *Fortune-Tellers & Philosophers.*

linked to discussions on information flow and ideas about how to know and handle the self, society, and state. Often sources are biased towards elite and state-related themes which, from the historical point of view, inextricably also situates concept formation and practical methods within discourses on power and control. This is most observable in officially compiled histories such as *Kojiki* 古事記 (Record of ancient matters, 712 CE) and *Nihon Shoki* 日本書紀 (Chronicles of Japan, 720 CE) in Japan, and the *Shiji* 史記 (Records of the Grand Historian, 91 BCE) and *Han shu* 漢書 (The History of Han, 82 CE) in China.[6]

Through history, scholarly debates provide an important context to the multiple practices employed to account for uncertainty. In the Chinese case, for instance, theories and practices took heavy recourse to antiquity, both recognizing the material practices around oracle bones as inscriptions and divinatory practices, yin-yang theories, and referring back to classic literature. Han scholars, for example, noticed the tension between knowing and uncertainty in *Lunyu* 論語 (the *Analects*), as Confucius admonished: "learn widely but leave the doubtful parts [open]" (*duowen queyi* 多聞闕疑). The *Analects* indeed note that a gentleman should make it clear what he does not know. (君子與其所不知，蓋闕如也).[7]

Ban Gu 班固 (32–92 CE) in the *Han Shu* 漢書 (Official History of the Han) hence concluded that books provided certainty through this kind of elaboration:

> According to the ancient system, words in a book must be used consistently. If one does not know [the meaning of a word], then leave it blank and ask the old people [for the answer]. When it came to the decaying era, right and wrong were not corrected, and people used them for their own advantage. (古制，書必同文，不知則闕，問諸故老．至於衰世，是非無正，人用其私). [8]

In other words, unknowing and uncertainty need to be noted to stand out in contrast with knowledge.

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[6] See Beinorius, "On the Religious and Cultural Aspects," 87; and Anna Andreeva's contribution in the glossary. For the political functions of omens and divination, see also Chang chia-feng and Huang Yi-long, "Zhongguo gudai tianwen. Chen Jiujin, *Diwang de xingzhan*.

[7] Liu Baonan, *Lunyu zhengyi*, 521.

[8] Ban Gu, *Hanshu*, juan 13, 1721

A further facet of being knowledgeable meant recognizing the need to be explicit about uncertainties. Grand historian Sima Qian 司馬遷 (145–86) reasoned that doubt (*yi* 疑) was innate in writing history because some materials were "unrefined" (*bu yaxun* 不雅驯), "unverified" (*wuji* 無稽) or even "absurd" (*guaiwang* 怪妄). Therefore, any kind of uncertainty about such historical "facts" had to be conveyed by recounting *all* the existing versions of an event so that future generations of scholars could research them further and reach their own conclusions about what had happened.[9] Although discussing knowledge about history, Sima Qian's view is helpful to understand the general relationship between uncertainty and the transmission of knowledge: uncertainty is part of knowing.

The notion of uncertainty pertained to two distinct strands, one related to the impossibility of knowing an individual's fate (*bukezhi* 不可知), and the second related to the possibilities of knowing a dynasty's heavenly mandate (*tianming* 天命). The argument went that, whereas there was a distinct design to dynastic fate, therefore it could be planned, it was far more difficult to follow the path of an individual's fate as his subconscious mind (i.e. desires and unreasonable needs) could interfere; as Confucius' *Analects* noted: "What activates the *dao*? Fate (*ming* 命). What stops the Dao working? Fate."[10] Over the following centuries, a diverse discourse developed in which scholars and elites of various schools explored how much of such heavenly scheming could be known, how they should deal with the uncertainties revolving around that which could not be known, and what the appropriate methods were "to know" or to manage the uncertainty of what could, or could not, be known. Lu Jia 陸賈 (240–170), a follower of the Confucian school, blended Daoist and Legalist thought with the theory of Yin-Yang, insisting that the heavens were entirely knowable and could be foreknown (*yuzhi* 預知). Other scholars, such as Wang Chong 王充 (27–97) or Wang Fu 王符 (85–163) deny any causal relationship between heavenly patterns and human behavior, going on to talk about contingency.

Such topics had reemerged full force by the Song Dynasty. To "leave open questions (*queyi* 闕疑)" or put the unknown and uncertain aside was also part of Zhu Xi's 朱熹

[9] Sima Qian, *Shiji*, juan 13, 505.
[10] Liu Baonan, *Lunyu*, juan 17, 593.

(1130–1200) scholarly method throughout. In his study of the *Yijing* 易經 (Book of Changes), Zhu Xi thus commented that, "for everything in the classics that cannot be explained, one should leave them [open]. If we insist in explaining, we will produce what is obtrusive and fallacious (經書有不可解處，只得闕．若一向去解，便有不通而謬處)."[11] From this perspective, uncertainty was seen to arise from unclear wording, abstruse characters or corrupt passages, and therefore certainty and uncertainty can also result entirely from a philological process.

Philological, intellectual and philosophical debates formed an important backdrop against which Chinese or Japanese elites planned and defined these frameworks, and determined which kinds of knowledge or information they deemed necessary and feasible to achieve when predicting and planning. They believed that certain formats and causalities contributed towards ascertaining a situation, an incident or a fact, whereas actors often realized that the working process itself was dependent on many other factors that were not easily controlled. When divining the gender of an emperor's heir at the Japanese court, for instance, those involved thought that the chronology of procedure mattered just as much as the adviser's social status.

Many historical actors considered human behavior to be the most hazardous component of the equation: whether it be an emperor's moral attitude, an examiner's values, or a woman's physical condition. Uncertainty also increased with an increase in the number of actors and whenever activities stretched over longer periods of time. Extrapolating from previous, similar, events was the key to it all, so the more factors that could be defined, the more accurate the prediction or planning.

Pre-modern and Modern Predicting and Planning: Empiricism and Rationales

These historical extrapolations are similar, for instance, to how today the accuracy of a prediction of the number of casualties in car accidents on any given Labor Day weekend increases with the number of factors known: specific weather conditions at a given place and time in certain traffic conditions.

Contemporary unplannable and thus also unpredictable aspects include, for example, the long-term effects of mobile phones on our societies or the impact of large-scale automation on the labor market, although it is now possible to begin observing and measuring some indicators related to these issues. In broad areas like these we are still

[11] Zhu Xi, *Yijing zhengyi*, 193.

speculating, creating models based on similes, just as the Chinese and Japanese ancient, medieval, and modern societies did.

Even today, no matter how much information we collect using different techniques, we are still a long way from being able to computerize the interplay of forces that operate in weather conditions and affect climate change in the longue durée, largely because social conditions are the most difficult to predict and plan. This is just as true now as it was in historical China and Japan, when the refusal of imperial rulers or ruling officials to take precautions to avert floods or droughts could produce unforeseen results.

Predicting and planning are thus also intricately reliant on politics and, as the lawyer and pioneering systems scientist Sir Geoffrey Vickers observed in mid-twentieth-century Post War Britain with regard to judgement: any decision-making—political, social, or economic—was eventually based on insufficient knowledge and uncertain circumstances.[12] As Vickers also pointed out, experts would emerge who were (or at least claimed to be) able to combine and reformulate data and information, determining what can be known or called facts, and what needs to be approximated or deduced. Indeed, whereas early modern time had its diviners, weather forecasters and political advisory boards, in modern times, the professionalization of uncertainty and its accountability are strongly anchored in mathematical procedures and Big Data accounts, producing statisticians, economists, or market analysists. In the past and the present, uncertainty remains a constant companion of life, approached by practitioners and scholars alike as part and parcel of their daily knowledge-making processes and an inevitable companion of both creative thinking and practices.

With the sentiment of going beyond the dichotomy of modern and pre-modern, science and superstition, this current version includes six contributions across East Asian history from the first to the twentieth century CE. At the very early end, Zhao Lu introduces how the literatus Wang Chong 王充 (27–97) conceptualized a non-causal relation between individuals and their fates, and how he applied it to the practice of divination. Anna Andreeva discusses the risk of childbirth in medieval Japan (tenth to sixteenth century CE) and how aristocratic families brought in various experts to reduce such risk and anxiety, ranging from midwives and physicians to

[12] Vickers, *The Art of Judgement*.

diviners and spirit mediums. Daniel Burton-Rose focuses on the uncertainty of civil examination results in the seventeenth century CE, and how local gentry negotiated such uncertainty through spirit writing. Stéphanie Homola looks into the language of divinatory computation in China, and juxtaposes it with arithmetic and mathematic language. David Bello introduces the Qing government's (1644–1912) attempt to eliminate locust plagues, an example in which human planning clashed with ecological uncertainty. Kerry Smith explores earthquake prediction in 1970's Japan, especially the rhetorical strategies that Japanese earth scientists used in 1978 to explain some of the uncertainties associated with short-term prediction to legislators. Among the six contributions, Zhao' and Homola's work focuses on the specific techniques of prediction and the underlying theories of how to know the unknown; Andreeva and Burton-Rose's work emphasizes the social strategies in coping with uncertainty; Bello and Smith's work focuses on the institutional articulation of the strategies of dealing with risks and uncertainty.

Predicting and/or Planning

We may all readily agree that it is difficult to draw the lines between predicting and planning in history, since each has contributed to the other. But clearly such lines have always existed, because some specific forms of accounting for uncertainty were considered more reasonable and valid than others, going beyond systems of belief. As Boumas and Hon have observed though,

> while the daily practice of empirical research, in and outside the laboratory, is dominated by dealing with all kinds of errors and uncertainties seeking reliable results, there exists no general cross-disciplinary framework for dealing with these concepts.[13]

When people encountered unknowingness or uncertainty in various historical periods, these endeavors were processed in ways that some called predicting, but which others thought of as plans or ways to "think ahead" and implement such preparedness. Still other notions always had a very particular character, so not all forms of accounting for and framing the not-yet-known were transferrable beyond an individual example or region. Yet what such forms of explanation often seem to have had in common was a wide range of material formats: in attempts to predict or plan, people may have been less concerned about truthfulness than they were with finding traceable patterns—

[13] Boumans/Hon, *Error and Uncertainty*, 10.

seeking reliability in repetition. Such identifiable configurations also frequently took a material format—as a book, an artefact, divination device, counting rod, a set of ritual practices—or all of these together. Thus, every entry in this glossary also contains a reference to the material means, practices, and visual representations historical actors used in their decision-making processes and their attempts to bring the unknown with reach, or make it at least manageable.

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Predicting Contingency in Imperial China

Zhao Lu[1]

Over the past few years, my colleagues and I have formed a research group on how concepts of contingency were expressed in East Asian history. We call ourselves "The Contingency Group." Ironically, whether we meet is also contingent. Indeed, contingency is intertwined with uncertainty and a sense of unpredictability. This chapter aims to untangle the complexity of contingency, uncertainty, and predictability. More specifically, we survey how historical actors in imperial China expressed contingency, a relationship that was neither random nor necessary. Instead of engaging in a solely conceptual discourse, we focus on how concepts like "contingency" and "uncertainty" emerged from divinatory practices, and how they were specifically gauged toward the mechanism of divination.

In the preprint version of this chapter, we first examine different definitions of the term contingency in the tradition of Western philosophy. As complicated as they might be, these definitions serve as a starting point for our analysis. Second, we survey terms and concepts surrounding the definitions of contingency in modern China. Third, we explore how Wang Chong 王充 (27–97 CE) examined the divinatory practices of his time and designed versions of non-causal relationships accordingly. Throughout the chapter, we start with the definition of contingency in Western philosophy as our initial guide, but soon afterwards we see that it is inadequate for describing the particularity of Wang Chong's case.

Contingency as an Analytical Concept

In describing an event, the term "contingency" has been used in the fields of philosophy, mathematics, finance, etc. The term can be somewhat confusing for it has a very wide range of meanings in various fields:

C1: The non-essential;

C2: the non-necessary;

C3: The unknow*able* or indetermin*able*;

C4: The indetermin*ate* in itself;

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C5: Intersection of two or more otherwise unconnected causal series;

C6: The non-purposeful.[2]

In general, these meanings engage in two categories: causality in the sense of necessity-impossibility, and certainty in the sense of predictability-unpredictability. Namely, C1 and C2 are about causality, focusing on the properties of a thing or event that do not determine others. C3 and C4 lean toward predictability, focusing on things or events that cannot be known or are not definite. C5 specifically describes the non-causal relationship between two series of things or events. And C6 generalizes another non-causal relationship that involves intentions and results.

The term contingency is meant to capture the uncertain situation between two rather certain ones: necessity and impossibility. But as C1, C2, C5, and C6 show, there are multiple situations that can be neither necessary nor impossible. And they can yield either predictable or unpredictable results. For example, it is contingent that the sun will rise tomorrow, but it is predictable. For another example, the weather on June 27, 2128 is contingent and is also unpredictable. The multi-layers are the reason why some of the meanings of contingency point to unpredictability, and in our daily language, contingency tends to be equivalent to "uncertain" and "random."[3]

Our goal here is not to decide what contingency should mean, but to present a range of relationships that are neither strictly causal nor random. In this chapter, I show that in pre-1911 China, certain people had not only noticed non-causal relations, but also elaborately engaged with the issue. Moreover, we will see how the calibration of non-causal relationships was directly related to techniques of predicting the future in first-century CE China.

Contingency in Modern China: a Chinese Translation (1889) of Joseph Haven's (1816–1874) *Mental Philosophy: Including the Intellect, Sensibilities, and Will* (1857)

If we look up the word "contingency" in a modern Chinese dictionary, most frequently we find *ouranxing* 偶然性, which means "randomness." This denotation

[2] Meyer, "Contingency," 73.

[3] It is worth emphasizing that there are not only different definitions of contingency used in different fields, but also that scholars are not necessarily satisfied with the existing definitions. See Drekalović, "Two Definitions of Contingency."

understandably reflects the daily use of "contingency" in English, but it omits the above- mentioned nuance. Another denotation defines "contingency" as *kenengxing* 可能性, which in Mandarin means "possibility." This denotation captures the range between necessity and impossibility, but treats "contingency" too similarly to "possibility." In fact, the biggest problem here is that the words *ouranxing* and *kenengxing* are predominantly used to translate "randomness" and "possibility," respectively. In other words, no Mandarin word conventionally designates "contingency." This shows the slipperiness in capturing the non-causal relationship.

For this reason, if one needs to translate "contingency" into Chinese, especially in a philosophical context, one needs to create specific designations. This is the case for the literary Chinese translation of Joseph Haven's (1816–1874) *Mental Philosophy: Including the Intellect, Sensibilities, and Will* (1857). Haven's *Mental Philosophy* is an early American textbook about moral philosophy and mental philosophy. The book was aimed to equip college students, that is, future clergymen, with a theoretical foundation of how the mind worked. The book was popular among many colleges, including the Episcopalian Kenyon College.[4]

In 1854, Yan Yongjing 顏永京 (1839–1898) graduated from the middle school established by the first Episcopalian Bishop in Shanghai, William Jones Boone (1811–1864), and was sent to Kenyon College for his undergraduate studies. He later became an Episcopalian Reverend, and from 1878, he helped the Episcopalian church to establish St. Johns College in Shanghai. For teaching purposes, he translated his college reading material, Haven's *Mental Philosophy*, into literary Chinese. Because the translation preceded the importation of Japanese translations of Western knowledge, Yan had to create certain words to correspond with Haven's terminology. "Contingent" is one of them.[5]

In explaining truth and reasoning, Haven wrote:

> The truths which constitute the material of our reasoning process are of two kinds, necessary, and contingent. That two straight lines cannot enclose a space, that the whole is greater than any one of its parts, are examples of the

[4] For the life of Joseph Haven, see Vaughn, "Amherst Professor Joseph Haven," 43–4.
[5] For the life of Yan Yongjing, see Xu Yihua "Yongjing yu Shenggong Hui." For Yan Yongjing's translation of *Mental Philosophy*, see the introduction of Zhao Lu, *Xinlingxue jiaozhu,* 30–39.

> former. That the earth is an oblate spheroid, moves in an elliptical orbit, and is attended by one satellite, are examples of the latter.[6]

Yan translated these sentences as:

> 辨實者是辨事物以得其實。凡事物之實有二。曰必然之實，曰**兩可**之實。兩直線不能圍一形。及全大於其分，是必然之實。地乃扁球，其軌道乃橢圓，有一月環繞諸類。是**兩可**之實。[7]

Haven continued to explain the difference between the two kinds:

> The difference is not that one is any *less certain* than the other, but of the one you cannot conceive the opposite, of the other you **can**.[8]

And Yan translated it as:

> 有謂必然與兩可之實所分別處，是否先者之實確於後者之實。予曰不然。觀必然之實，我萬不能想其非實。兩可之實，我**或能**想其非實。所分別者在此。[9]

Haven's definition of "contingency" is similar to the aforementioned C2, pointing to necessity. Embedded in the tradition of common-sense philosophy, he uses our mind as a tool to examine the term: a contingent event is the one we can *perceive* to be one way or the other. In contrast, the opposite of a necessary event is not perceivable. In the translation, Yan most noticeably avoids using the word *ouran* 偶然 to translate "contingency," for it contains a strong connotation of randomness, which is not Haven's intention.

Instead, he translates "contingent" as "either-way," or *liangke* 兩可, which literally means something "can be either way." Less commonly used than *ouran*, "either-way" as a term can be traced back to the third century CE and refers to an argumentative style that can develop an argument towards one direction or another.[10] More generally in literary Chinese, the term refers to situations that can go either way,

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[6] Haven, *Mental Philosophy*, 188.
[7] Yan Yongjing, *Xinling xue,* 69.
[8] Haven, *Mental Philosophy*, 188.
[9] Yan Yongjing, *Xinling xue*, 69.
[10] This is only briefly mentioned in "Deng Xi holds the theory of either-way and creates infinite speeches" (鄧析操兩可之說，設無窮之辭。). See Yang Bojun, *Liezi jishi*, 6: 201–2. Based on the context as well as Yang's annotations, *liangke* seems to refer to rhetorical skills in legal arguments.

such as political events. Because of the uncertain tone, it also has a pejorative connotation of ambivalence, for instance, an official statement could be too ambivalent (*liangke*). Here Yan ignores the pejorative implication and uses it more literally.

Haven's definition, as well as Yan's translation, also clarify the relationship between "certainty" and "contingency." According to them, a contingent event can be just as certain as a necessary event, and thus just as predictable. Their understanding tacitly renders C3 and C4 irrelevant, because according to their definition, a contingent event can be either as certain or uncertain as a necessary event.[11]

Interestingly, Yan also adds a nuance to the difference between necessary and contingent truths as mentioned by Haven. Yan uses the adverb *huo* 或 to translate Haven's "can." *Huo* as an adverb literally means "sometimes" or "perhaps," but together with the next modal word *neng* 能 (can), it is similar to "could" or even "might" in English. In other words, in Haven one *can* perceive the opposite of an event, but in Yan one *might or might not* do so. In this way, Yan adds a connotation of "possibility" to the original.

In the case of Yan Yongjing, the motivation for expressing the non-causal relation is the translation of Haven's work. Throughout the process, he has to redefine existing terms in literary Chinese and contextualize them in Joseph Haven's mental philosophy discourse. Accordingly, he transforms *liangke* from a common term expressing ambiguity to the Chinese equivalent of contingency. Now the question is: are there other words for contingency in classical Chinese, and how are they related to certain practices? In the next section, we answer these questions by tracing the term *ouran*.

Discourses Weighed in the Balance (Lunheng 論衡) by Wang Chong 王充 (27–97 CE)

Completed in 80 CE, *Discourses Weighed in the Balance* is a systematic critique of numerous beliefs and practices commonly held by the author's contemporaries, ranging from the efficacy of divination to the concepts of fate. Since the twentieth

[11] For definitions of certainty, and their relationship with necessity, see Malcolm, "Knowledge and Belief"; Firth, "The Anatomy of Certainty"; Casullo, "Necessity, Certainty, and the a Priori."

century, this work has been presented as a scientific precursor against superstition both among scholarly circles and in PRC propaganda.[12]

Moving away from this teleology of modern science, the author Wang Chong was dissatisfied with the customs and behaviors of his time. His writings were thus aimed to reveal those problems and assert his beliefs. In his lost work, *An Abridged Critique on Customs* (*Jisu jieyi* 譏俗節義), he intended to expose the absurdity of common customs; in his other lost work, the *Essentials of Government* (*Zheng wu* 政務), he aimed to distinguish the essential parts of the government from the rest; and his goal in the *Discourses* was to "attack the false and absurd" (*ji xuwang* 疾虛妄). In other words, Wang Chong sought to rectify the society he was living in.[13]

This is not to say that Wang Chong lived during a chaotic time in China. He was born into a merchant family in the last years of a civil war between the founder of the Eastern Han (25–220 CE), Liu Xiu 劉秀 (5 BCE–57 CE), and the warlord Gongsun Shu 公孫述 (?–36 CE). He spent most of his adult life under the reigns of three strong rulers Liu Xiu, Emperor Ming (28–75 CE), and Emperor Zhang (75–88 CE). During their reign, the Eastern Han recovered from three decades of political turmoil and enjoyed agricultural prosperity. Internationally, the dynasty successfully defeated the Northern Xiongnu and regained control over its western regions.[14]

In fact, Wang Chong's critique of contemporary customs was thanks to a robust travel culture during the Eastern Han. In the first decades of the new dynasty, central and local governments were desperate to fill the 152,986 official and staff positions across the empire.[15] In order to be given a position, one needed to have a recommendation from one's teacher, who taught the so-called Confucian classics. As a result, students, or officials-to-be, travelled long distances in order to find a teacher

[12] See the salient literature review of the Chinese and English language scholarship on Wang Chong in Klein and Klein "Wang Chong's Epistemology of Testimony," 115–17.
[13] *Lunheng jiaoshi*, 20: 870; 30: 1187–94.
[14] See Bielenstein, "Wang Man"; Yü Ying-shih, "Han Foreign Relations."
[15] This is the number given by the ninth-century text *Tongdian* 通典. See the ratio between the number of officials and the Eastern Han population in the chart provided by Jin Guantao and Liu Qingfeng, *Xingsheng yu weiji,* 27.

as well as be close to a job vacancy. One direct result was the increasingly frequent exchange of knowledge.[16]

Wang Chong was a typical product of this travel culture. A native of Kuaiji 會稽, he traveled to the capital Luoyang 洛陽 to attend the National Academy (Taixue 太學). There he became a student of Ban Biao 班彪 (3–54 CE), the father of the future Grand Historian Ban Gu 班固(32–92 CE). In addition to the works taught by his teacher, Wang Chong gained access to more books through bookstores in the Luoyang markets. Later he took a minor position in local government, although he resigned shortly after due to frequent arguments with his supervisor. After that he focused on writing his own work.[17]

The combative tone in Wang Chong's *Discourses Weighed in Balance* often gives modern readers the impression that he was a sophist obsessed with literal precision. However, this does not mean that he did not believe in anything, nor was the book only intended to attack. Rather, Wang Chong's *Discourses* claims or negates the validity of certain beliefs and practices through the examination of their testimonies. In many cases, he would articulate what he believed to be the most valid. Or in Klein and Klein's more precise language, he was a demanding, piecemeal, non-reductionist in the epistemology of testimony.[18]

During Wang Chong's time, divination, including the observation of omens, was a common practice. Typically, these divination methods involved an inquirer who would ask questions, especially concerning the future, divinatory methods that had routinized mechanisms to produce symbols, and diviners who could perform the methods. Often the inquirer would ask a diviner questions, and after the diviner performed a divination, the resulting symbol would be the answer.[19]

A first century BCE excavated divination manuscript, "The Essentials of Jing" (*Jingjue* 荊决), represents a routine that randomly produces a divinatory symbol. According to the text, the diviner needs to (1) randomly divide thirty sticks into three

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[16] See Bielenstein, "Wang Mang"; "Ebrey "Economic and Social History of Later Han"; Zhao Lu, "In Pursuit of the Great Peace."
[17] *Lunheng jiaoshi*, 30: 1187–9; Fan Ye, *Houhan shu*, 19: 1629.
[18] See Klein and Klein, "Wang Chong's Epistemology of Testimony," 121.
[19] For the varieties of divination in early China and their characteristics in comparison with ancient Greek divination, see Raphals, *Divination and Prediction*.

piles; (2) divide each of the piles into sets of four; (3) keep the remainder (if no remainder it is counted as four); (4) The three remainders form a three-layer symbol as the divinatory sign that corresponds to auspiciousness or inauspiciousness.

For example, someone loses his sheep and goes to a diviner to ask whether he will find it later. The diviner performs the method from the "Essentials of Jing," and through the procedure, he happens to divide the sticks into 8, 11, and 11 as the first, second, and third piles, the remainders of which are 4, 3, and 3, respectively. The remainders form the symbol:  —the 4 from the first pile is translated into the four horizontal lines on top, the 3 from the second pile into the three vertical lines in the middle, and the 3 from the third pile into three horizontal lines on the bottom. According to the manuscript, this divinatory sign is called Jia 甲 and indicates inauspiciousness.[20] Then the diviner decides to tell the owner that he will not find the sheep.

For most people, there was a relationship between the divinatory signs and the inquired events. Wang Chong articulated this relationship:

> 或難曰：《洪範》庶徵曰：「急，恒寒若；舒，恆燠若。」若、順，燠、溫，恆、常也。人君急，則常寒順之；舒，則常溫順之。寒溫應急舒，謂之非政，如何？夫豈謂急不寒、舒不溫哉？
>
> Someone questioned: "The section about various manifestations in the 'Great Standard' says 'When [the lord] is impetuous, it is constantly cold; when [he] eases down, it is constantly warm.' *Ruo* means 'follow'; *yu* means 'warm,' *heng* means 'constant.' When the lord [of a state] is impetuous, then constant coldness follows him; when the lord eases down, then constant warmness follows him. Coldness and warmness correspond with impetuousness and ease, [respectively]. How can one say this is not about government? How can we not say that impetuousness does not [lead to] coldness and ease does not [lead to] to warmness?"
>
> 人君急舒而寒溫遞至，**偶適**自然，若故相應。猶卜之得兆，筮之得數也。人謂天地應令問，其實**適然**。夫寒溫之應急舒，猶兆數之應令問也，外若相應，其實**偶然**。何以驗之？夫天道**自然**，自然無為。二令參偶[二偶三合]，遭適逢會，人事始作，天氣已有，故曰道也。使應政事，是有[為]，非自然也。[21]

[20] *Beijing Daxue Chutu Wenxian Yanjiusuo*, 169–77.
[21] *Lunheng jiaoshi*, 14: 630–31.

> [I answered:] When a lord becomes impetuous or calm, and coldness and warmness come alternately, [this is because] they **coincidently happen to be** so by themselves (*ziran*). It looks like they have corresponded, but in fact it [only] **happens to be** so. This is like obtaining patterns from scapulimancy or obtaining numbers from stalk divination. People say Heaven and Earth are answering inquiries, but actually they just happen to be so. The correspondence between temperament and temperature is just like that between inquiries and divination results. From the outside, they look like they correspond with each other, but actually they are **coincidental** (*ouran*). How do we verify that [theory]? The Way of Heaven is **being so by itself** (*ziran*). When it is as so by itself, it is spontaneous (*wuwei*). When two [things] pair up and three [things] match [with each other], they happen to encounter and meet. When people start to act, the heavenly *qi* is already there. This is called the Way. If we think that it corresponds to government, this is action, not "being so by itself (*ziran*)."

In describing relationships between events, Wang Chong uses several verbs: *shi* 適, *ou* 偶, *ying* 應, and more obviously in other passages, *zao* 遭, *yu* 遇, *feng* 逢, *hui* 會. Generally, in classical Chinese, these verbs can be divided into two groups: while *ying* stands alone to mainly refer to aural responses, all the other verbs predominantly describe the meeting of two physical objects, especially people, armies, and celestial beings. By Wang Chong's time, they differ in expressing the specificity of "meeting":

yu 遇 means "to meet" in the most general way, occasionally with the connotation that two parties happen to meet each other;

ou 偶 emphasizes *two* parties appearing at the same place, or coinciding;

shi 適 has the strongest connotation that two parties *happen* to meet without premeditation;

hui 會 can either indicate a premeditated meeting among parties of people, or a conjunction of celestial bodies without any implication of causality;

feng 逢 emphasizes the moment of meeting;

zao 遭 has the connotation that one party is not willing to meet the others, but it still happens (as in travelers encountering robbers)

All these verbs on meeting differ from *ying* 應 in a second way: causality. Comparatively, *ying* gives the most definite connotation of causal relation than any other verb. In addition, Wang Chong intentionally uses the other verbs in a non-causal way; in his writing, even *hui* is not used in the sense of people meeting. Behind the

distinctions of these two types of verbs is Wang Chong's effort to distinguish causal and non-causal relations.

Wang Chong further uses the following expressions based on the verbs in the passage:

Shiran 適然 "happen to be"

Ouran 偶然 "coincidentally"

Ziran 自然 "being so by itself"

Xiangying 相應 "correspond to"

The first three terms are adjectives marked by the suffix *ran*, which indicates being in the state of a thing or event. With this suffix, the two verbs *shi* and *ou* become adjectives that designate the state of being accidental or coincidental. Thus, they are in even sharper contrast with the fourth term *xiangying* in terms of causality. Marked by *ran*, the third term *ziran* is the state of being oneself or the thing itself, indicating autonomy. In Wang Chong's use, it refers to things or events that are independent from other things or events, and thus are a testimony of non-causality.[22]

This passage comes from an interlocution on whether a ruler's emotions would cause changes in the weather. Wang Chong argues that they would not, because the changes in the weather belong to the way of Heaven, and that is independent, or "being so by itself." Therefore, the ruler's emotions are not causal, or "corresponding to" the weather change. If one event does happen before another, according to Wang Chong, they just happen to coincide. By the same principle, divinatory signs and the preceding events have the same relationship.

That is to say, Wang Chong criticizes the commonly assumed relationship in divinatory practice. As he mentions, during his time many divinatory methods relied on either generating a sign by heating bones or shells until they cracked, or through randomly dividing certain amounts of stalks. Behind the practices is the belief that the signs "respond" (*ying* 應) to the inquired events. Thus, the signs and the events are

[22] This issue is also related Wang Chong's view on fate, or, in his terminology, *ming* 命. See Raphals, "Fate, Fortune, Chance, and Luck," 549–51.

causal in the sense that events decide which sign will be generated through the divinatory methods.

Wang Chong negates this causality again by referring to the nature of Heaven. According to him, Heaven works independently without being influenced by human beings, and as such it does not respond to human beings' inquiries through any means, including through the generation of a divinatory sign. Therefore, human inquiries and divinatory signs might coincide (*ou* 偶), but they only happen to do so. In other words, the inquiries and signs constitute two series of events that happen to meet with each other at a given time without any cause. This is exactly the C5 definition of contingency: the intersection of two or more otherwise unconnected causal series.

Then in Wang Chong's eyes, is this intersection random?[23] The answer is no:

> 夫鑽龜揲蓍自有兆數，兆數之見，自有吉凶，而吉凶之人，適與相逢。吉人與善兆合，凶人與惡數遇，猶吉人行道逢吉事，顧睨見祥物，非吉事祥物為吉人瑞應也。凶人遭遇凶惡於道，亦如之。夫見善惡，非天應答，適與善惡相逢遇也。鑽龜揲蓍有吉凶之兆者，逢吉遭凶之類也。。。夫卜曰「逢」，筮曰「遇」，實遭遇所得，非善惡所致也。善則逢吉，惡則遇凶，天道自然，非為人也。[24]
>
> In drilling the turtle shells or dividing the yarrow stalks, there are signs [produced] on their own. The appearance of signs has auspiciousness on their own; auspicious and inauspicious people happen to encounter them. Auspicious people match with auspicious signs, and inauspicious people with inauspicious signs. This is like how, when auspicious people walk on the street, they encounter auspicious events; when they look around, they see auspicious things. This is not because auspicious things or events function as auspicious people's auspicious omens. It is the same principle for an inauspicious person encountering inauspicious and vicious things on the street. Seeing auspiciousness or inauspiciousness is not because Heaven responds; it happens to encounter good or bad people. [Therefore], when one drills the turtle shells or divides the yarrow stalks and he/she receives signs of auspiciousness, it is like encountering auspiciousness or inauspiciousness…Scapulimancy is called "encountering" and stalk divination is called "meeting"; they come from encountering and meeting, they are not caused by goodness or badness. Goodness encounters auspiciousness, and

[23] For random, I mean that a "random product is a series of outcomes of some repeated process that is disorderly and irregular, regardless of how it was produced." See Eagle, "Probability and Randomness," 441.
[24] *Lunheng jiaoshi*, 24: 1003.

> badness encounters inauspiciousness. The way of Heaven is by itself and not for people.

This quotation comes from the chapter "On Divination" ("Bushi 卜筮"), where Wang Chong disputes the belief that divination can discern auspiciousness because Heaven or spirits can listen to people's inquiries and respond through divination.[25] This belief also bears the assumption that Heaven and spirits process knowledge about past and future events. In the chapter, Wang Chong dismisses the idea that Heaven or spirits can listen to people's inquiries and respond through divination.

Surprisingly, he defends the idea that divination can recognize auspiciousness. In fact, Wang Chong gives his own explanation of the divinatory mechanism. The quotation mentions two series: auspicious/inauspicious signs and good/bad people. Firstly, he claims a non-causal relationship between the two series: he dismisses the idea that auspicious signs correspond (*ying*) to good people, i.e. the goodness of people causes auspicious signs. Instead, he argues that good people simply happen (*shi*) to encounter (*feng*) auspicious signs, and that bad people happen to encounter inauspicious signs. Words like *feng*, *shi*, *yu* are used in contrast with *ying* to highlight the non-causal relationship.

Secondly, and more significantly, this process is not random. According to him, auspicious signs and good people aggregate, and so do inauspicious omens and bad people. This aggregation is certain to the extent that patterns are observable and thus predictable in divination, or as Wang Chong announces, "divination must show auspiciousness." In the chapter, he cites textual precedents on how tyrants received disastrous divinatory results while benevolent rulers received auspicious omens.[26] If we understand "randomness" as a state lacking pattern or predictability, this is certainly not the case for divination.

Thirdly, the whole divinatory process is non-purposeful. Even though a divination involves human inquiry, the process does not particularly respond to it. Here Wang Chong deploys his *ziran* argument again: Heaven is being so by itself, thus it does not respond to anything, including human beings. Behind this argument is his dissatisfaction with the common belief of the time that Heaven intends to reward

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[25] Ibid., 24: 998–1000.
[26] Ibid., 24: 1002.

goodness and punish evil. For him, it does not intend to; it simply happens to be so. In this way, divination as a mechanism does not change course due to any agency's intention.

In short, to Wang Chong, divination produces a non-causal, non-purposeful, and predictable relationship between the divinatory signs and inquirers. Here, in addition to C6, Wang Chong also adds another layer to the C5 definition of contingency: two otherwise unconnected causal series do intersect, and they *tend* to intersect. In addition, this intersection is also non-purposeful as it is the way of Heaven by itself (*ziran*). As elusory and agnostic as his theorization might sound, Wang Chong may have modeled this on well-known phenomena of his time. In fact, this non-causal, but rather predictable relation is comparable to his observation that certain celestial bodies tend to conjunct more than with others, but none of them are the cause of the conjunction *per se*.[27]

Wang Chong's "contingency" is interesting not so much because it gives another variety of contingency than because of its close relationship with practice, in this case, divination. First, his primary goal in the chapter on divination is to assess its mechanism. His "contingency" emerges through the examination of the mechanism in competition with other theories. Second, he assesses the efficacy of divination in this chapter. And by citing precedents, he argues in favor of the efficacy. His "contingency" is thus used to explain this efficacy. Thirdly, he focuses and refines specific words to describe the mechanism of divination without coining one single term for "contingency." In contrast to the aforementioned case of Yan Yongjing, this choice of terminology shows his interest in convincing his contemporaries how divination works before anything else.

[27] Ibid., 3: 101.

Illustration

Fig.1: Turtle divination from Yinwan, first century BCE (redrawing)

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Childbirth and the "Arts of Judgement" in Medieval Japan

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In medieval Japan (tenth to sixteenth century), childbirth was fraught with precariousness and danger. Although the physiological process of pregnancy was basically understood, it was never quite clear how exactly the events would unfold. Therefore, multifaceted measures had to be taken in order to account for different kinds of perceived risks and intangible threats; plans had to be put into place before any eventuality could take shape. For the elite households, for example, reproduction and childbirth were often matters of physical, ritual, economic, and political uncertainty, and they had to be dealt with as cautiously as possible.

Japan's leading aristocratic families and high-ranking warrior houses, such as the Fujiwara 藤原, the Taira 平, the Saionji 西園寺 based in the Heian capital (nowadays Kyoto), or the Hōjō 北条, based in Kamakura (present-day Kanagawa prefecture in eastern Japan), had particularly high stakes and expectations, since their daughters usually entered the court or shogunal service at a young age. In the case of the Fujiwara and Saionji, the predominate focus of this chapter, the political career of an elite courtier were partially tied to his daughter's advancement at court, her love affairs, and marital relations with other elite men, including—possibly—the ruling emperor. In the case of the latter, the political status of certain branches of the Fujiwara family (of whom the Saionji were the descendants) to some degree depended on their women's ability to conceive, carry the pregnancy to term, endure a difficult labor, and give birth to the next ruler. Since the mid-ninth century, the Fujiwara aristocrats had traditionally occupied some of the highest political positions at court, including those of regent (*sesshō* 摂政), chief advisor to the ruling emperor (*kanpaku* 関白), or prime minister (*dajō daijin* 太政大臣); their daughters' promotions as primary or secondary imperial consorts and their fecundity were critical components in the highly symbolic and politically savvy projects of "reproducing the ruler." Becoming the mother to the next sovereign meant that not only could a consort potentially achieve the status of "nation's mother" (*kokumo* 國母), but she could also ensure political and economic stability for particular branches within the Fujiwara family. For her father and brothers, the political rewards could also be extremely high: the birth of a boy could spell one's elevation to a higher rank and a new lucrative post within the court or shogunal official hierarchy, often

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with good economic returns in the form of land estates, servants, and resources. Therefore, the implicit family expectations placed on elite women entering the court service must have been high, and the family's private preparation and planning for the best or worst possible outcomes of their daughters' love lives were among the most intensely scrutinized priorities. Similarly, for the women's royal husbands, ruling emperors or shoguns, the birth of a healthy son was a cause for serious consideration: ensuring that they had a male heir (preferably, several—often from different mothers) was paramount for the successful selection of the next ruler, a peaceful transfer of power, ensuring the stability of their own lineage and essentially, the medieval Japanese state, which was often envisioned as an ideal Buddhist kingdom. That said, it is evident that for the aristocratic families hoping to gain rewards through their daughter's marriage to the ruling emperor, the anxiety over the outcome of her pregnancy and the resulting *political uncertainty* must have been high.

However, it was the elite noble women who experienced the wear and tear of *emotional* and *physical uncertainty* first-hand: their love games at court were often fraught with personal unpredictability and competition, while their experience of the actual processes of conception, fetal gestation, and childbirth could all be besieged by various physical and cosmological ailments. Most significantly, death in childbirth was a real danger, as mortality ran quite high for both women and infants. Demonic invasion or possession by unseen malevolent spirits was another tangible threat to elite households whose daughters became pregnant. The household's sense of urgency for ensuring at all costs the necessary protective ritual performances (for example, for prolonging life; *enmei* 延命), identifying the desired cosmological alignments and suitable action plans, while keeping strict directional and pollution taboos (*kegare* 穢れ) at bay, was among the most dominant factors of aristocratic family life in medieval Japan.[2] And although the fear of the unseen volatile entities and karmic obstacles was great, such *ritual uncertainty* could be effectively resolved since it depended on the household's knowledge of auspicious precedents and correct action protocol, skillful manipulation of ritual technologies as well as effective control of space and time by the means of divination and prediction. Most of the resulting expenses comprised appropriate gifts to the emperor and high-ranking Buddhist and Shinto clerics, emoluments to the religious and medical specialists and retainers, ritual donations to shrines and temples, and the costs of procuring necessary material items. These expenses were to be paid out by the court

[2] On the notion of ritual pollution during childbirth, see Tonomura Hitomi, "Birth-Giving and Avoidance Taboo."

and the consort's family, with significant help from their retainers. The number and quality of different items and disbursements were subject to strict planning beforehand, and, given their necessarily exquisite quality, could be a matter of *economic uncertainty*.

This circular, self-reinforcing progression of *different forms of uncertainty*, related to reproduction and ranging from physical, ritual, and cosmological to economic and political modes, thus could be understood as an important aspect of intellectual and material lives of medieval Japanese society. To reduce these risks and uncertainties, the elite households led by the royal consort's father and her brothers invested considerable time and resources in cultivating the certain "arts of judgement," that in effect helped them to *plan* their actions, *predict* favorable or threatening possibilities, and *make informed decisions* at crucial points in time, against the background of constantly shifting circumstances.[3] These "arts of judgements" were practiced by men and women, both elite and low-ranking, as well as professional experts who were all involved in the elite project of "reproducing the ruler." Following this predominantly political and economic goal of "reproducing" the next sovereign, the complicated social landscape of childbirth in the elite households of medieval Japan, in this case, the Fujiwara and the Saionji, can be explained in terms of different forms of expertise and practicing of both subtle and overt forms of prediction and planning.

Although the larger study of childbirth in medieval Japan is still ongoing,[4] a preliminary analysis of medieval Buddhist handbooks and ritual memoranda on pregnancy and childbirth as well as court protocols, personal diaries, and divination records produced at the behest of Japan's imperial court has already shown several important trends. Even though the processes and events these records describe all centered implicitly on pregnant noble women, they were overseen and directed formally by the male heads of aristocratic families (that is the consort's fathers and brothers), and ritually by male Buddhist clerics, many of whom were connected to the imperial house and elite households by blood or family ties. Additional support was also continuously provided by the *yin-yang* diviners (*onmyōji* 陰陽師; the time-keeping specialists and prognosticators), exorcists (*genja* 験者), female shamans and

[3] On my use of the term "the arts of judgement," see Andreeva, "Explaining Conception to Women?", especially 180–181.

[4] This larger study is currently conducted at the Heidelberg Center for Transcultural Studies (HCTS) at the University of Heidelberg, under the auspices of an independent research project "Buddhism, medicine and gender in the 10th–16th century Japan: toward a transcultural history of women's health in premodern East Asia," sponsored by the German Research Council (DFG) from 2017–2020. Details are accessible online at http://www.asia-europe.uni-heidelberg.de/en/hcts/associated-projects/anna-andreeva.html

spirit mediums (*miko* 巫女), physicians (*kusushi* 医師), midwives (*sanba* 産婆), wet nurses (*menoto* 乳母), and female relatives.[5] The social organization of pregnancy and childbirth at the medieval Japanese court thus suggests that these vital experiences in the noble women's reproductive lives were socially constructed and ritually mediated as multi-layered, networked epistemic events of a prolonged nature that required different kinds of support by many men and women, each specializing in different tasks and expertise.

The Forms of Expertise

We can summarize the agency of these men and women and their respective "arts of judgement" in the following scheme which can be divided into the "outside" and "inside" of the secluded birth chamber. The chamber would have to be constructed at a suitable spot within the mansion of the imperial consort's father; its exact location and auspicious direction which the consort in labor had to face when giving birth was to be calculated by the *yin-yang* diviners (*onmyōji*), usually men belonging either to the Abe 安部 or Kamo 賀茂 hereditary lineages specializing in divination and calendric techniques.[6] The inside space of the birthing chamber was only accessible to and governed by trusted women: that is, ladies-in-waiting and personal assistants of the imperial consort who acted as intermediaries between the inside and outside of the chamber; older midwives who would physically support the consort during labor, embracing her from the back and massaging her hips; wet nurses, who would later become significant social authority figures for the new emperor; and most importantly, the consort's mother, an elite aristocratic woman who herself may have given birth to other male sovereigns. Midwives in particular would be in charge of immediate obstetric decisions, practical application of drugs (possibly, surgery), and the cutting of the umbilical cord (although in some cases, this task would be entrusted to male relatives or retainers of the consort's family). The consort's mother would sponsor some of the protective rituals on her behalf and could also be directly involved in liaising with her own husband, the head of the household, as well as administering drugs to her daughter.[7] In the aftermath of labor, female servants would be in charge of cleaning, storing, and burying the placenta. Given these

[5] The various aspects of this set up have already been discussed in ibid.; Andreeva, "Childbirth in Aristocratic Households"; Suzuki Yui, "Twanging Bows"; Andreeva, "Childbirth in Early Medieval Japan"; Andreeva, "Devising the Esoteric Rituals"; Gunji Naoko, "Birth of Emperor Antoku."

[6] Some important precursors to this practice, in the case of premodern China, were previously discussed in Lee, "Gender and Medicine."

[7] See literary fiction examples discussed in Andreeva, "Childbirth in Aristocratic Households."

women's crucial expertise and important functions in making the progress of the imperial consort's labor as smooth as possible, it is fair to compare them to what the scholar of Sanskrit literature Martha Ann Selby has called "experienced women."[8] These women's understanding of the progress of pregnancy and labor as well as the physical and emotional state of the pregnant consort were no doubt informed by their own manifold experiences both of birth-giving and taking care of other women during labor —the subtle and private, not ever once publicly discussed, the "women-only" arts of judgement.

The outside space comprised the rest of the consort's father's mansion; overall, the aristocratic household's network often extended further to the Buddhist temples and Shinto shrines situated elsewhere in the Heian capital. The same could be said about the elite warrior families in Kamakura. The religious institutions, linked to the elite households by blood and family ties, were tasked with performing protective Buddhist and Shinto rituals on behalf of pregnant imperial consort and sponsored by her family and its closest retainers. The outside of the chamber was mostly governed by men, although the ladies-in-waiting and lower-ranking women also had significant roles to play. At the center of most crucial decision-making in this part of the mansion would be the consort's father, a major beneficiary of planning and prediction procedures taken to *account for various kinds of uncertainty* during his daughter's pregnancy and labor. Surrounded by the consort's brothers or other male relatives, he was the chief social orchestrator of these critical events. The household's "planning officers" (*tsukasa* 司) were responsible for technical roles, such as the preparation of material items, food, furniture, and gifts necessary during and after the consort's labor.[9] Male samurai guards and retainers were tasked with bringing various items from remote locations, such as the sword to be included in the first ceremonies for the newborn royal male infant. Oftentimes, it had to be delivered from one of the Shinto shrines in the capital, the Kitano Shrine 北野天宮. Other male and female servants would run a gamut of small errands: some would be preparing furniture or tubs of rice and hot water; others, namely male servants, would be tasked with dropping clay dishes from the roof, or twanging the bows to avert malevolent spirits perceived to be one of the sources of threat, precariousness, and uncertainty during the royal labor.[10]

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[8] Selby, "Narratives of Conception," 254–275; Andreeva, "Explaining Conception to Women?", 196.

[9] On the exact protocol for preparing and distributing various necessary items, including gifts, see Andreeva, "Childbirth in Early Medieval Japan."

[10] See these activities described in Suzuki Yui, "Twanging Bows" and Gunji Naoko, "Birth of Emperor Antoku."

The experts and practitioners of the special "arts of judgement" which were critical to the successful handling of the unpredictable process of a royal consort's labor could be potentially divided into two groups: the household *prediction experts* and the *cosmological orchestrators*. The former included the already mentioned *yin-yang* diviners, who played a major role as advisors for controlling time and space and practicing a number of prediction and calculation techniques. These techniques, a kind of a hereditary social capital of the Abe and Kamo lineages, derived from the continental knowledge of time-keeping, calendrics, astrology as well as the yarrow-stalk, deer scapula, and geomantic divination. Significant methods of observation and prediction derived from divination on the *Book of Changes*.

The court physicians, hailing from the lineages of Tanba 丹波 or Wake 和気, were responsible for diagnosis, effective treatment of long-term and urgent ailments, and preparing specific-formula medicine and ointments. Although rarely able to examine the royal consort in person, they were nevertheless also skilled in some divination techniques, such as calculating the unborn child's gender or individual women's fertility. Some of the divination techniques employed by both the *yin-yang* diviners and physicians can be found in Japan's earliest surviving medical treatise, *Ishinpō* 医心方 (Essentials of Medicine, ca. 984), compiled for the imperial court in Kyoto by the physician Tanba no Yasuyori 丹波康頼 (912–995).[11]

The art historian of medieval Japan, Yui Suzuki, has noted that the diviners performed ritual incantations or purification rites (*harae* 祓え) to prevent angry household deities from harming the woman in labor. She has noted their role in postnatal divinations for the placenta burial, and other necessary ritual actions, such as the cutting of the umbilical cord and a newborn baby's first bath.[12] My research shows that in medieval Japan such divination experts were called to aristocratic mansions to provide services *before* the labor progressed too far: by using the yarrow-stalk and trigram divination techniques, they defined the auspicious time of labor, a location for the birth chamber, the position of circumambulating household deities, and the direction that the parturient woman should face while giving

[11] For the modern Japanese annotated edition of the *Ishinpō*, see Maki Sachiko 槙佐知子, *Ishinpō: Maki Sachiko*. For further discussions of women's health in the *Ishinpō*, see Lee, "*Ishinpo* and Its Excerpts"; "Childbirth in Imperial China"; "Gender and Medicine"; "Wet Nurses." For a more recent discussion of the overall editorial composition of the *Ishinpō*, see Khan, "Continental Medical Literary Tradition".
[12] Suzuki Yui, "Twanging Bows", 35–36.

birth.[13] Here is a record from the late twelfth-century court protocol describing the labor of one of the Fujiwara daughters known as Shichijōin 七条院, which took place between 1178–1180.

> Following the signs of labor, various monks, physicians, and yin-yang diviners were summoned. First of all, the diviner inquired about the location of a circumambulating deity, the direction that the laboring woman must face, and the [position of the] "opposing branches" (Ch. fanzhi 反支, Jp. hanshi). He performed divination (miuranai 御卜) [and decided on the specific place and position for childbirth]. […She gave birth facing east].[14]

Due to their critical role in predicting the necessary places and time and ability to advise on the auspicious locations and course of actions, the *yin-yang* diviners could also be included into the second category of *cosmological orchestrators*. Esoteric Buddhist monks, mostly high-ranking Tendai and Shingon clerics related to the royal and elite aristocratic households by blood, were summoned to the court to perform protective, corrective, or fate-altering rituals for the benefit of a pregnant imperial consort and her unborn child. These rituals were necessarily expensive and required many material and financial resources that had to be procured by the consort's family, in addition to the temple donations and gifts to the clerics and their assistants. Shinto priests, another category of religious specialists capable of dealing with ritual uncertainty, were in charge of ritual ablutions (*omisogi* 御禊) and cleansing away the ritual pollution (*kegare*), resulting from the flow of bodily fluids, postpartum blood, and delivery of the placenta.[15] The exorcists—usually male ascetics specializing in esoteric Buddhist rituals, mountain practices, healing, and pacification of malevolent entities—oversaw the cases of spirit possession by a female shaman, particularly if the royal consort was undergoing a difficult labor.[16] Their actions, which took place in the immediate vicinity of the birthing chamber, created an "inquiry and feedback" loop of communication between the physical and unseen worlds, inhabited by humans and deities.

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[13] A glimpse of these practices, to some extent, can be discerned from the Tang precedents, discussed previously in Lee "Gender and Medicine." However, a closer examination of the medieval Japanese cases also reveals noticeable differences. Therefore, I prefer to investigate the Japan case separately.

[14] *Kōgū osan tōjitsu shidai*, by an anonymous author. Translated and quoted in Andreeva, "Childbirth in Early Medieval Japan," 339.

[15] See the role of the Shinto priests discussed in Andreeva, "Childbirth in Early Medieval Japan" and Gunji Naoko, "Birth of Emperor Antoku."

[16] Ibid.; Suzuki Yui, "Twanging Bows."

Planning and Prediction

Once the royal consort's pregnancy was confirmed, often with a semi-private ceremony of "empowering the pregnancy sash," the elite households and imperial court had to invest in both material and cosmological preparation to the royal consort's labor and childbirth. As already mentioned above, the *planning* aspect was costly as it covered both the *economy of knowledge* (i.e., advance cultivation of the expertise of court prediction specialists and cosmological orchestrators who would be called on during labor and childbirth; the necessary use of their "arts of judgement") and the *economy of gifts* (i.e., advance preparation of the items that would be either used during the labor or be later distributed to all event participants, from the ruling emperor to the lowest servant, depending on their rank and contribution).

The material objects involved in tackling the uncertainty of childbirth through planning and prediction could be specified as follows. The advance planning was to be done in some instances by the governmental agencies of the imperial court, but given the elite status of male Fujiwara courtiers, it was done mostly by their own families, and namely the father and brothers of the imperial consort, with some help from the court officials, the household's "planning officers," and family retainers. This planning included procurement of: a) *gifts* (horses, bolts of silk, robes, coins, swords, decorations for women's attire); b) *furniture and everyday objects* (wooden planks, tatami mats, straw, ash, oxen hide, rice, bows, arrows, clay dishes, water tubs, bamboo knives, silk gauze, raw cotton, different kinds of paper, ritual paper strips, medicinal plants, substances, and elixirs, wooden trays and containers). The above-mentioned items were to be prepared by the household in advance, but some of them could become necessary at any moment, depending on the state of emergency.[17] Thus, it was important for the household to have the finqncilafinancial means to stock all of these necessary items, often at a short notice. Moreover, the acquisition, production, storage, and movement of these items through the household was stipulated by the family's wealth as well as the geographical disposition and architecture of the father's mansion. Hence, in terms of material planning and preparations, no two cases of royal consort's pregnancy and childbirth could be exactly the same, as many circumstances differed. Further discussion of this thread would necessitate an expansion into the spheres of economic, material, and architectural history as well as the histories of silk, textiles, plants, and medicine.

[17] On the use of some of these objects, see the edited translation of the court protocol for Shichijōin's labor, in Andreeva, "Childbirth in Medieval Japan"; for Taira no Tokushi's labor, see Gunji Naoko, "Birth of Emperor Antoku."

Prediction, on the other hand, was mostly used by the elite household in the form of intangible skills of *yin-yang* diviners, court physicians, and other cosmological orchestrators, who would be either officially employed by the household (on a stipend) or summoned especially for the occasion of the royal consort's labor (in exchange for a gift). Such expertise required long-term fostering and patronage; special knowledge-holders would then expect material rewards and daily provisions. This aspect was intrinsically related to the households' *longue durée* planning. However, in addition to expert knowledge, intangible skills, methods of observation, and the ability to use different forms of prediction and divination during the royal consort's pregnancy and childbirth, the elite household also had to have access to several different but overlapping "knowledge repositories" in the form of texts, historic protocols, books, encyclopedias, treatises on calculation techniques, and medical expertise. Included into this category were also special tools used by the diviners.

The details of such necessary tangible and intangible items can be further summarized as follows. The *divination- and decision-making tools* included the items used by the *yin-yang* diviners: yarrow stalks, divination board (*shikiban* 式盤), game boards, and bronze, wood-plank, or paper dolls for transferring the ritual pollution from the royal body (*kamigata*, or *ningyō* 人形), as well as other items; but they also included the methods of observation of celestial bodies and star movements as well as both male- and female-oriented methods of observing the human body along with its inward and outward modes of expression.

The *knowledge repositories* used by experts during the ongoing processes of the royal consort's pregnancy and childbirth comprised pre-existing action protocols in forms of scrolls, handbooks, official records, including political, medical, and ritual text resources; astrological and calculation techniques as well as the Daoist and Buddhist ritual texts and talismans employed during critical situations, such as infertility, difficult childbirth, slow delivery of the placenta, or a premature death of the fetus in the womb.

The Analytical Glossary of Uncertainty in Medieval Japan

Auspicious Precedent (*kachoku* 嘉躅, *karei* 嘉例, or *kichirei* 吉例)

Based on their own private and official court records, Japanese elite aristocratic families whose daughters became royal consorts and were expected to have a child by the ruling emperor had to calculate and establish a course of actions that legitimated and ensured auspicious outcomes of the consort's pregnancy. To find out about successful precedents, a consultation and checking of actual written records was necessary. This was mostly the task for court scribes and mid-ranking officials, whereas the calculation of the auspicious dates for

proceeding with planned rituals and actions was carried out by the *yin-yang* diviners. One of the above-mentioned terms was employed by the medieval aristocrat Saionji Kinhira 西園寺公衡 (1264–1315) to allude to his family planning routine in the early fourteenth century, when one of his sisters was preparing to give birth to a royal heir. Kinhira, the son of the eminent court figure Fujiwara (Saionji) no Sanekane 藤原実兼 (1249–1332) was also the elder brother of two imperial consorts, Shōkunmon'in 昭訓門院 (1273–1336) and Kōgimon'in 広義門院 (1292–1357),[18] and a crucial witness to several important events linked to the pregnancies and childbirths at court. His diary, *Kinhira kōki* 公衡公記, documents how the Saionji family dealt with various kinds of uncertainty during their daughters' pregnancy and labor:

> Second year of Kengen 乾元.
>
> Fourth month, eleventh day (1302.04.11). Tsuchinoto mi (kishi) 己巳.19 […] Heavenly Yin (ten'in 天陰),20 no rain. However, after dark there was a light rain which [made] dripping [sounds] from time to time. It stopped again after a while.
>
> Conforming without deviation (Jp. hen fui 偏不異, Ch. pian buyi) to the auspicious precedent (kachoku) from the first year of Kenchō 建長 (1249) is the only thing [we can do].21 Today, Shōkunmon'in must proceed to the Imadegawa mansion,22 where the birthing chamber (osanjo 御産所) is to be made. There are auspicious traces of august births from two generations during both Kangen 寛元 (1243–1247) and Kenchō (1249–1257) eras.23 […] Each and everyone had their orders officially assigned, including those with menial jobs of cleaning and spreading the fresh sand. From yesterday on, there was decoration, construction, instalment.[24]

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[18] Shōkunmon'in was the court title of Fujiwara (Saionji) no Eishi 瑛子, the consort of emperor Kameyama 亀山天皇. Kōgimon'in, or Fujiwara (Saionji) no Yasuko 寧子, was the consort of emperor Go-Fushimi.
[19] The sixth of the ten earthly branches and sixth of the twelve heavenly stems.
[20] One of the Twenty-Eight Mansions or constellations in the Chinese astrological system; belongs in the western region of the White Tiger and may correspond to the Pleiades or Taurus.
[21] The record here refers to the case of Prince Tsunehito, the future emperor Kameyama (r. 1259–1274), who was born in 1249 to emperor Go-Saga and Fujiwara (Saionji) no Kitsushi (or Yoshiko 姞子, 1225–1292).
[22] The Saionji family mansion in the northern part of Kyoto, at Kitayama.
[23] In Kangen 1 (1243), prince Hisahito, the future emperor Go-Fukakusa (r. 1246–1260, d. 1304) was born to emperor Go-Saga and Saionji no Kitsushi. He was an older brother to emperor Kameyama.
[24] Saionji Kinhira, *Shōkunmon'in osan guki*, 15. Translation mine.

Divination, Prediction (miuranai 御卜)

In his records detailing his sister Shōkunmon'in's labor, Kinhira further describes how his family used the predictive technologies available at the time, and how the specific divinations were conducted. From his diary, it becomes clear that matters requiring the family's joint decision-making were continued on the twenty first day of the fourth month, roughly, ten days after the record cited above. The following result was procured by the chief diviner of the imperial Bureau of Divination (*onmyōryō* 陰陽寮), Kamo no Arihide 賀茂有秀. It was obtained by combining various methods: consultation of the calendar, calculation techniques, observation of astral bodies, and trigram divination based on the *Book of Changes*.

> The officiating Lord Mibu […] summoned seven yin-yang diviners and ordered them to predict whether the royal birth would be sooner or later (osan sōban ari no miuranai 御産早晩有御占). […]
>
> "Regarding the august childbirth, on what day and what hour will it already occur? Will it be sooner or later?"
>
> The divination: this is the day of *tsuchinoto u* 己卯. The hour will be additionally announced. The elements rising just before the [sign of the] Rabbit and produce effect. They command the six directions (*rikugō wo iru*将六合). The middle deity is the empress (*nakagami wa kisaki* 中神后). The Agent of the year is Rabbit. Rising up is greatly auspicious (*ue wa daikichi* 上大吉). The astral constellation is Flying Serpent (Jp. *tōda* 騰蛇, Ch. *tengshe*). The trigram (Jp. *ke* 卦, Ch. *gua*): opportunity to lie down and groan (*fushi samayoi ni ashirau* 遇伏吟), dragon fights three exchanges (*ryū ga mitsu no majiwari wo tatakau* 龍戰三交). Prognosticating this (*kore wo oshite* 推之), on the day and hour of Rat, Horse, Dragon, or Dog, the peace must succeed, and there must not be any delays or protractions of form.
>
> The second year of Kengen, the month of the Rabbit, twenty-first day.
>
> The chief of Bureau of Divination, Kamo no Arihide.[25]

Divination/Prediction and Auspicious Precedent are the only two terms which occur repeatedly in Japanese historical sources, but there were certainly many other important notions which referred to the complex actions that the medieval royal court and aristocratic families had to undertake in order to account for various kinds of uncertainty. These uncertainties, ranging from the physical and ritual to the economic and political, enveloped and shaped the often difficult and unpredictable process of "reproducing the ruler" in

[25] Saionji Kinhira, *Kinhira kōki bekki*, 37.

medieval Japan. However, as can be seen from the sources discussed above, even though medieval societies lacked certain capabilities of modern biomedicine, the “arts of judgement” that medieval Japanese families were able to employ were far from being primitive. Judged on their own terms, they were well prepared for many eventualities.

Illustration

Fig. 2: “Two women and a child.” By Harunobu 春信 ? Wood-block print, no date. Paper, ink. Author's collection.

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Spirit-Altar Prophecy and the Civil Service Examinations in Qing Dynasty China: The Pengs of Suzhou

Daniel Burton-Rose[1]

Beginning in the Song dynasty (960–1279), communication with deities through methods of automatic writing became popular among candidates in the civil service examinations. Success in the examinations was the only way for elite men to attain the government posts that conferred status and fulfillment of the ideal career paths. With so much riding on examination success, examination hopefuls often turned to divine aid for insight into the content and outcome of the examinations.[2] A new degree of commercial and infrastructural integration during the Song dynasty prompted the spread of previously local cults. Among these was that of the former Sichuanese snake deity, Wenchang, who, conflated with an astral deity described in the classics, became the primary divine patron of examination hopefuls.[3]

My contributions to the *Analytical Glossary* below focus on how participants in the examination system—both anxiety-ridden candidates and proud degree holders—accounted for the inherent uncertainties of the system through specific mantic practices and broader ideological constructions. I do so through attention to a patrilineal organization—the common surname group "the Pengs"—in the city of Suzhou in the seventeenth through nineteenth centuries. Due to its location on the Grand Canal and centrality in the fecund Yangzi Delta region, Suzhou was one of the wealthiest cities in the empire.[4] Patrilineal organizations in Suzhou such as the Pengs channeled money derived from commerce into education, securing degrees and subsequently offices through the civil examination system. Successful patrilines formed alliances through intermarriage and collective endeavors such as shrine construction. By the late seventeenth century, the Pengs of Suzhou were on course to

[1] Northern Arizona University/MPIWG
[2] On all aspects of the civil examination, see Elman, *Civil Examinations in Late Imperial China;* for prognostication and exams, ibid., 295–370.
[3] For an overview of the development and spread of the Wenchang cult, see Kleeman, *God's Own Tale*, 72–8; Kleeman, "Expansion of the Wen-Ch'ang Cult."
[4] For an introduction to late imperial Suzhou, see Marmé, *Suzhou*; also Wu Jen-shu, *You you fang xiang*.

become the most successful corporate lineage in the entire empire in terms of civil examination performance during the early to mid-Qing dynasty (1644–1911).

The Pengs of Suzhou were also pioneers of a charitable style of status justification in which lineage patriarchs explained their worldly success as divine reward for the virtue of their ancestors. Beginning in the early Qing, Peng patriarchs endorsed the promulgation of morality books (*shanshu* 善書), which contained pithy statements on proper ethical behavior and advocated their own reproduction.[5] As a handful of key morality books accumulated anecdotal tales associated with their success, Peng patriarchs themselves became the subjects of such works; morality books broadcast the patrilineal explanation for their examination success to an empire-wide audience; this audience was thereby encouraged to emulate the Peng philanthropic program.

Spirit-altars were a key element in the morality book milieu: in collective, often homosocial environments that combined sociality and cultural performance with piety, automatic writing revived figures of the past by literally bringing them to life. Spirit-writing altars served as a locus of elite sociality, providing communications with past cultural luminaries that flattered the living by association, as well as ethical injunctions aimed at restraining the indulgent behavior of powerful patriarchs. In this sense, spirit-writing altars can be understood in light of Max Weber's (1864–1920) laudatory remarks on social function of the "sects" he witnessed during his 1904 visit to the United States. Participation was voluntary and attractive because an invitation to join indicated an acceptance by a privileged peer group. Divine favor manifest as ethical behavior, a dialectal tautology through which local elites presented a flattering view of themselves while monitoring one another's behavior as they engaged in socioeconomic as well as religio-cultural endeavors.[6]

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[5] On morality books, see Brokaw, *Social Change and Moral Order*; Sakai Tadao, *Zōho Chūgoku zensho no kenkyū*; Yau Chi-on, *Quanhua jinzhen*, and *Shan yu ren tong*.

[6] See Loader and Alexander, "Max Weber on Churches and Sects," 3; Weber, "'Churches' and 'Sects' in North America," and the relevant passage in *Protestant Ethic and the Spirit of Capitalism*.
In late Ming and early to mid-Qing Suzhou, the responsibilities attendant on participants in spirit-writing altar sessions were much less than what could be characterized as "membership": there was a strong overlap with pleasurable leisure activities, which is part of what gave them their social power. There is much about the

The examination system was rife with contingencies: new policies, shifting curricula, the tastes, student-teacher networks of individual examiners, and the specter of corruption or simple incompetence, as well as intimate aspects such as the sheer corporeal control demanded of the examinee over the multi-day ordeal. With so many unknowns, those who sat for the examinations attempted to *control for variables*. Consulting spirit-mediums or spirit-altar deities regarding the content or outcome of a particular examination was a common way to plan for uncertainty.

The explanation by prominent Peng patriarchs of how they had accounted for uncertainty by eliciting divine aid as a reward for beneficent acts inspired myriads of other examination hopefuls to *account for uncertainty* in the same manner. By working from lineage members' self-narration out towards evidence of those who promulgated their claims and emulated their behavior, I aim to illuminate the familial, social, and intellectual context in which prophecy occurred and its fulfillment or failure unfolded. My sources for the discussion of emic and etic vocabulary and concepts that follow include autobiographical accounts, poetry, séance transcripts, morality books, liturgies, and illustrations.

Glossary Entries

Emic *Doubt* (*yi* 疑: doubt; being doubted by others; *zi cai* 自猜: self-doubt)

An act of prognostication asserts a particular vision of the future. This vision is generally beneficial to the party who receives it. In zero sum calculations of benefit, such prognostications invariably call forth challengers among those who would lose out, were the changes described to come to pass.[7] The range of consequences is as wide as the range of subjects humans ask the gods about: in our case study, the apparently individual fortune of an examination candidate had implications for the balance of power among a handful of Suzhounese patrilines whose fortunes, in turn,

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morality book milieu in which ethical exhortations received on spirit altars were published and disseminated that cries out for analytical engagement with Weber's arguments on the financial continence of a particular devotional program. For a direct engagement with the Weberian thesis by a major late twentieth-century Chinese intellectual, see Yu Yingshi, *Zhongguo jinshi.*

[7] The potentially contradictory nature of granting requests to competing claims is acknowledged within Chinese religious cults. An example is a folktale collected in the 1940s, in which Guan Yu's incompetent subordinate Zhou Cang cannot reconcile ostensibly contradictory requests, necessitating the intervention of his more skilled superior Lord Guan. See the discussion in ter Haar, *Guan Yu,* 160–161.

were linked to the empire as a whole. Spirit-altars operated privately (invitation only in a private residence) or publicly (in a temple with free ingress and egress), but by its nature spirit-writing was transparent: all present could see how the divine message was transmitted, and had socially acceptable means to contest it. If the options for contestation were not exercised, the communication was collectively accepted, thereby gaining social power. This entry for **Doubt* does not reach this stage: it stays with contested divine communications. A prognostication accepted provided a basis for planning, but there could be no planning if the party receiving the prophecy could not get others to accept it and thus make a plan of action predicated upon it. For this reason, **Doubt* gets to the heart of the acts of social persuasion behind prophecy claims.

Doubt (*yi* 疑) was directed toward Peng Dingqiu (1645–1719) when he related a prophecy he claimed to have received in 1674 foretelling his examination success to a group outside of his immediate family; as a consequence, he experienced *self-doubt* (*zi cai* 自猜). Dingqiu had clearly witnessed and likely participated in spirit-altars officiated by others, but he had been alone when he received what he characterized vaguely as "many auspicious words" (*duo jixiang yu* 多吉祥語).[8] This solitude posed problems for the collective social validation of divine communication that was at the heart of the practice of spirit-writing.

Dingqiu informed his father what he had been told. His father, in turn, convened a spirit altar with other participants in order to confirm the prophecy, which from the context was clearly about examination success. It is not clear from Dingqiu's account whether or not his own father was skeptical about the content of the prophecy his son reported or the means by which it was obtained. It is clear, however, that Dingqiu's father felt that the form and content of the divine communication would need to be attested to in order for the prophecy to have social validity.

Dingqiu's father set up a conventional spirit-altar and experienced attendees gathered. Yet Dingqiu persisted in his solitary form of receiving the communication, meaning that the others could not see any text that others could verify: they were still dependent on Dingqiu's self-reporting of a message that had tremendous implications for how he would be perceived within local society. The message Dingqiu received in

[8] Peng Dingqiu, *Shijiang gong nianpu,* 14a.

this second session was quite precise: "In the *bingchen* year [1676] the register of examination results will state: 'Palace and metropolitan: on both examinations it has already been noted that Dingqiu is the top ranked.'" Dingqiu related what followed:

> [I] made this known to the general attendees. There were none who were not breathless, dubious and surprised. [They] said I had been possessed. I, too, was doubtful, [concerned] that it was not the intention of [the spirit] that had been conveyed.
>
> 設壇七日，遂示『丙辰榜信曰：「殿會兩試已注定求第一名」』。對衆宣明，無不咋舌疑詫，謂余着魔。余亦自猜，非意所至。[9]

In this session convened to determine collective buy-in or collective refusal, the other participants (*zhong* 衆) opted for the latter. If the prophecy Dingqiu reported was not true, what had they witnessed the young man doing? Exactly what spirit-writing, as an ostentatious act of literacy capable of bridging the divide of the realm of the dead (*you* 幽) and that of the living (*ming* 明), sought to render obsolete: demonic possession (**Interference by Ghosts*). Such a verdict also provided a clear basis for a course of action: exorcism. Thus, an immense gulf existed between the implied plans of action based on acceptance or rejection of the prophecy. If the prophecy was valid, empire-wide recognition of Dingqiu's brilliance was imminent. If it was not, a demon inside the young man needed to be summoned to an otherworldly judicial reckoning and disciplined. Such was the gulf between the two possibilities that Dingqiu refused to accede to the other participants' rejection. In his own mind, his assertion of the truth of the prophecy was validated when it was fulfilled in 1676.

Etic *Replicability*

The exact replication of the same results from the same procedure is a definitional aspect of modern science as it emerged from early modern cultures of experiment. The bird-asphyxiating air pump of Peng Dingqiu's contemporary Robert Boyle (1627–91) serves as a synecdoche for the entire process in which elite men defined themselves as publicly accountable, in contrast to the occult secrecy of alchemy.[10] The sublimation of devotional elements into the new experimental program is nicely captured in Joseph Wright of Derby's 1768 oil painting of a provincial attempt to

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[9] Peng Dingqiu, *Shijiang gong nianpu,* 14a.

[10] My approach to the social dynamics of seventeenth and eighteenth-century spirit-altars owes much to Shapin's classic questioning of the narrative constructed by Boyle and his Royal Society brethren, "House of Experiment."

replicate Boyle's experiment; the faces of the witnesses are illuminated with divine awe, as the composition perpetuated conventions of religious iconography. The concept of *Replicability is relevant in two ways in relation to the Pengs, spirit-writing, and the civil examination system.

Etic *Replicability* 1: Spirit-Altar Communications

Demonstrating replicability was a prophylaxis protecting against uncertainty: if something could be reproduced once, it could be employed as a guide for future behavior. It is evident in Dingqiu's account of his 1674 prophecy that replicability was an important element of communal verification of prophecy reception. In a normally functioning altar a reassuring replicability could take the form of the same deities descending and declaring similar injunctions. Dingqiu's account of the events of 1674 revealed deeper strains, hence a more precise replicability was in order: one that applied both to Dingqiu's unorthodox solitary method and the content of the divine communication.

Etic *Replicability* 2: Divine Favor of the Patriline

In 1727 Peng Dingqiu's grandson Qifeng 啟豐 (1701–84) obtained the same exalted distinction as his grandfather had: top place in the metropolitan and the palace examination, or "two-fold optimus" (er yuan 二元). This was the highest distinction achieved by a figure in the Qing (there was a "three-fold optimus" [san yuan 三元] in the Ming, but not in the Qing), and no other patriline could claim two in the dynasty. For this reason, soon after Qifeng's success, the Pengs became an emblem in the morality book milieu of the implementation of ethical injunctions resulting in divine favor manifest in examination success for sons and grandsons. The connection between Dingqiu's devotion to Wenchang and Dingqiu and Qifeng's two-fold optimi degrees is stated explicitly in Huang Zhengyuan's 黃正元 (fl.1734–55) *Yinzhi wen tu shuo* 陰騭文圖說 (Composition on Hidden Virtue, with Illustrations and Explications; preface 1737). The testimony of Dingqiu and Qifeng's paired success, titled "Numinous Proofs of Serving and Practicing the Tract on Hidden Virtue" (Fengxing Yinzhiwen ling yan 奉行陰騭文靈驗), was placed directly after the Yinzhiwen itself,[11] while a depiction of Qifeng passing through the optimus arch at

[11] Huang Zhengyuan, *Yinzhiwen tu shuo*, 6a (anecdote); 2a (Peng Qifeng picture). For a full translation of the passage, see Burton-Rose "Peng Dingqiu's Posthumous Career," 25.

the Suzhou prefectural Confucian temple was printed just after a portrait of Wenchang (**Proof*).

Etic *Interference by Ghosts (gui 鬼)*

A vibrant ecology of supernatural beings was constantly present in Suzhou. One helped select for the better element among such creatures by setting up an altar under the guidance of an experienced altar supervisor, protected by a particular deity, and following conventions of creating sacred space such as lighting incense. Yet things still went wrong. A common problem with spirit altar communications is that they did not make sense: they were gibberish or could otherwise not be reconciled with participants' sense of objective reality. These problems were potentially socially disruptive. A structural-functionalist reading of spirit-altars would stress the social ties that could be made between elite men participating in such activities. Convening for a failed séance would have undermined the purpose of such an exercise. Blaming ghosts was the spirit altar equivalent of kicking a dog; claims of interference by lower supernatural beings could save face for the altar supervisor or a participant to whom an unflattering communication had been directed.

An example of a spirit-altar enthusiast in the Peng patriline encountering interference from lower forms of supernatural beings, dates from the 1770s, a full century after Peng Dingqiu's contested prophecy of the *Doubt entry. The anecdote was related by Dingqiu's great-grandson Shaosheng (thirteenth lineal generation) about Peng Qihui 啟輝 (zi Kaimin 開敏; twelfth lineal generation).[12] Qihui was a county student who lived in the same residential compound Dingqiu had inhabited just inside the southeastern city gate. In 1764 he established a spirit-writing altar at the Hill Viewing Pavilion (Jianshan ge 見山閣) in the Peng residence. The anecdote below addresses the difficulty Qihui experienced reaching the appropriate deities, and his strategy for solving the problem. The events related demonstrate great continuity in: the spatial presence of the Peng patriline in urban Suzhou; patrilineal association with Wenchang devotion and spirit-writing; and patrilineal control over spirit-altar transcripts and the physical means by which to distribute them (with an editorial slant

[12] Peng Qihui was of a different branch of the Pengs than Dingqiu and Shaosheng, with whom he shared an ancestor in the seventh generation. See the relevant entries in the genealogical chart of the *Pengshi zongpu*, Peng Xizheng and Peng Yi, 2: 8b–9b, 41a.

flattering to patrilineal interests). It also demonstrates that, even for the scion of a celebrated lineage, setting up one's own spirit-writing altar as a strategy to gain local stature was by no means assured.

The account reads:

> At the time Changzhou county student Peng Qihui was residing in the bottom story of the [Hill Viewing] Pavilion. He and two disciples clasped the planchette. The first [spirit] to exert pressure was a ghost. The words were disordered. Thereupon Qihui set up a painted portrait of Wenchang, he and his disciples prostrated themselves while reciting the *Heart-Mind Penance Liturgy of the Jade Bureau*, and prayed to the god for silent assistance. Three months passed. And then they obtained a celestial perfected who descended to the altar.
>
> 時長洲學生彭啟輝館閣下。與弟子二人扶乩。始為鬼所憑，語無倫次。啟輝乃設文昌畫像，與弟子禮誦《玉局心懺》，祈神默佑。越三月。遂得天真降壇。[13]

One form of uncertainty implicitly experienced by the assembled participants who were not themselves the altar supervisor (the *zhong* 眾 of the 1674 anecdote) was: is the altar supervisor competent to contact the deities? Peng Qihui was taking a chance by attempting to set up his own altar; he was spending the social capital of being a Peng, of having figures such as Dingqiu and Qifeng as celebrated relatives. He laid out the social capital with the goal of accumulating more, but if the spirits failed to descend—if all he had to show for his efforts was a ghost writing gobbledygook—he personally would lose face. By extension, the claim of the entire patriline to special divine favor due to the accumulated virtue of their ancestors would be open to question among fellow Suzhounese elites (**Replicability 2: Divine Favor of the Patriline*).

The *Heart-Mind Penance Liturgy of the Jade Bureau* was itself a product of Peng Dingqiu's spirit-altar received in 1680 after the fulfillment of his two-fold *optimus* prophecy and a four-year stint in officialdom in the capital. For Peng Qihui, reciting this liturgy was a clear reminder to those present of the Peng lineage legacy as it related to Wenchang devotion and civil examination success. Regardless, Qihui came nowhere near to the examination success of his illustrious relatives Dingqiu and

[13] Peng Shaosheng, *Guansheng dijun quanshu*, 2: 22a. Punctuation as in original.

Dingqiu's grandson Qifeng. The three-month interregnum before the appearance of a proper deity must have been a stressful one for him.

Emic *Proof (zheng* 證 **or 証**: proof;** *ling yan* 靈驗**: numinous evidence*)***

In advocating a particular path to certainty, a primary way of demonstrating that it *would* work was demonstrating that it *had* worked. For this reason, one witnesses a massive expansion of anecdotal evidence included in the morality books of the mid- and late Qing dynasties. Here I briefly discuss two: Huang Zhengyuan's *Yinzhi wen tu shuo* and Pan En'gao's 潘恩誥 *Jueshi jing zhuzheng* 覺世經注證 (Scripture Awakening the World, with Commentary and Proofs, 1850).[14] These two are selected among myriad others for their connection to the Pengs: the former uses them an emblem of successful practice (**Replicability 2: Divine Favor of the Patriline*), while the latter claimed to be based on an "original Suzhou Peng edition" (Gusu Peng shi yuanben 姑蘇彭氏原本), thereby asserting Peng patriline endorsement of its contents.

The *Yinzhi wen tu shuo* and and *Jueshi jing zhusheng* typify two ends of the morality book market: Huang's compilation is a luxury production, replete with illustrations and decadent in employment of empty space for clarity of presentation. Pan's collection is a cramped, unillustrated affair. In the 1880 edition *Yinzhi wen tu shuo* featured 195 anecdotes over four bound volumes; the 1899 edition of *Jueshi jing zhusheng* squeezed 163 into one volume. Although Huang did not use the word "proof" in the title, as Pan would, in his "Principles of Compilation" (*fanli* 凡例) he referred to the anecdotes as "cases of proof" (*an zheng* 案証), making it clear that he conceived of the anecdotes as serving an evidential function.

In these works, there is no *qualitative* shift in the strategy of persuasion; the effort is purely *quantitative*. This strategy was widely employed in eighteenth-century European evidentiary culture as seen in the *Nemesis Divina* of Carl von Linné (1707–78).[15] Here the great taxonomist searched for order in the moral universe through

[14] A facsimile reproduction of the 1899 edition of the *Jueshi jing zhuzheng* by a "Mr. Wu" (Wu shi 吳氏) is contained in the *Zangwai daoshu*, v. 4: 120–164. The reference to the Pengs is on 1a (rpd. 120).

[15] On *Nemesis Divina*, see Paul Fleming, "Anecdote and exemplarity,"; Lepenies, "Divine Retaliation,"; Kimler, Review of *Nemesis Divina.*

divine retribution, but the allusive nature of the task is clear from the seemingly random arrangement of many of the tales. The morality book anecdote collections followed a set format in which the home city of the devotee, their name, and their age at the time of the incident were provided. Historically verifiable figures are combined with those given vague identifiers like a surname with no proper name. The more anonymous figures serve a "self-insert" function in which the reader is encouraged to imagine themselves obtaining the promised rewards (or being punished).

If there was a *qualitative* aspect in the persuasive strategies of mid-Qing morality books, it lay in the *status* of the individual(s) who the compiler(s) claimed were rewarded because of their implementation of the advocated practice. As a two-fold *optimus*, Peng Dingqiu was among the most successful examples regarding the *civil service examination system* conceivable.

Illustration

Fig. 3: You Tong 尤侗 (1618-1704) was a prominent Suzhou literatus who participated in the spirit-writing altar of Peng Dingqiu. This illustration from You's autobiography depicts himself receiving a visit from an emissary of the Jade Bureau, the celestial bureaucracy of Wenchang with which Dingqiu facilitated communication. The site of the contact is the Cultural Star Pavilion 文星閣 in southeastern urban Suzhou. From You Hui'an Taishi nianpu tu yong 尤悔菴太史年譜圖詠 (Chronological Autobiography of the Local Notable You Hui'an, with Illustrations and Verses), 1: 17a. In You Xitang quanji 尤西堂全集 (Complete Works of You Tong), Shanghai: Wenrui lou, 1900. Courtesy of the East Asian Library and the Gest Collection, Princeton University Library.

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Reducing Uncertainty through Computation in Chinese Divinatory Arts

Stéphanie Homola[1]

This article focuses on technical terms related to the reduction of uncertainty in Chinese divinatory techniques. Such technical terms are mainly found in systematized forms of divination (i.e. divinatory arts, 數術 *shushu*).[2] In the context of Chinese divinatory arts, uncertainty can be considered as a lack of knowledge about one's actual, and consequently future, position in the cosmos. Such uncertainty can be reduced through technical manipulations of objects and numbers, first through an addition step that ensures that the divinatory process effectively grabs the cosmological complexity of the situation, and, second, through a reducing/division step that reduces the complexity to a scale that is understandable by the human mind. These techniques provide a support for decision-making based on an organized vision of possible future courses of action. They produce a template for action planning by reducing the horizons of decision (cf. oracle's article). While limiting and defining directories of action, reducing processes also result in the selection of one occurrence in these directories which constitutes the basis for action planning. The following survey is based on primary sources which gather three types of systematized divinatory techniques.

Cleromancy involves the selection, through various processes (counting out objects or casting objects), of a hexagram of the *Book of Changes* which provides the basis for interpretation.

Chronomancy techniques rely on dates as input data (either the date of the divination or the birth date of the petitioner). Dates are processed into numerals and counted out in a six (Small six *ren*) or twelve term (Treasure of the palm) cyclic system, usually using the hand as a counting device[3]. Results are associated with an interpretative system that consists of a list of configurations with a various but limited

[1] Collège de France, Paris/IKGF, Friedrich-Alexander-Universität Erlangen
[2] Such terms and related procedures are not specific to Chinese divination, as shown by ethnomathematics (Ascher, *Mathematics Elsewhere*).
[3] Homola, "Les usages de la main."

scope that corresponds to the aforementioned cyclic system (six elements in the Small six *ren*, twelve elements in the Treasure of the palm).

The last technique, Plum-blossom numbers of the *Changes*, is a mix of cleromancy and chronomancy: dates are processed to select a hexagram of the *Book of Changes*.

Primary sources listed below gather four types of documents: historical texts which are considered classical works in the field (such as the "Yarrow ritual" excerpted from Zhu Xi's *Zhouyi benyi*); contemporary editions of classical texts (such as the Treasure of the palm); contemporary manuals or almanacs written by professional and/or scholarly diviners which present classical techniques (often based on classical works which are not always mentioned) in a didactic way and contemporary language (such as the Rice method, Drawing bamboo sticks, the Small six *ren*); divinatory techniques collected orally through interviews with diviners during fieldwork (Plum-blossom numbers of the *Changes*). Whereas each technique is presented below based on a single source, it is possible to gather the four types of documents on most of the techniques.

Systemized forms of divination usually follow a three steps process. First, input data are encoded into numerals in order to be processed. Input data are usually concrete data from the environment such as numbers of objects or numbered objects (in cleromancy methods) and dates (in chronomancy methods). Second, numerals are subjected to various computations. Third, the results of these computations are associated with symbolic systems of mantic figures:

> […] most techniques belonging to this category precisely revolve around the diviner's ability to properly associate symbols to the data extracted from the question (and the questioner), before inferring an answer.[4]

This article focuses specifically on the second step of this process—computation—and analyses the technical processes and related vocabulary through which concrete data such as objects and temporal parameters are converted into mantic figures.

Technical terms show that these computations follow a two-steps process. First, computations require a high "random" number (of objects or numerals), "random" meaning here that it must be ensured that it is not affected by human

[4] Hayek "Correlating Time," 530.

intervention. This number is either readily available through the manipulation of small objects (fifty stalks in the Yarrow ritual, rice grains in the Rice method) or calculated through the *addition* of temporal parameters (Small six *ren,* Treasure of the palm). Second, this high number is processed through a *division* operation which refers either to counting out objects serially (Yarrow ritual, Rice method), to counting out numbers serially (Small six *ren,* Treasure of the palm), or to arithmetic division (Plum-blossom numbers of the *Changes*). Both operations—addition and division—involve literal *manipulations* (operations on objects or numbers performed by the hand) which are designated by various technical terms[5].

The addition process ensures that the divination fully takes into account both the specificity and the complexity (multiple dimensions) of the moment/situation at stake in the divination. Then, the division process allows a reduction in the complexity of the situation (that mirrors the unfathomable diversity of the cosmos) to a scale that can be apprehended by the human mind. The key point in this division process is that attention is paid not to the result (quotient) but to the remainder of the division which constitutes the true result of the operation[6]. The result (the remainder) is limited to a precise range which is defined by the divisor. Thus, when looking to select one trigram out of eight, the sum is divided by eight and the remainder gives the number of the selected trigram, such as in the Rice method and Plum-blossom numbers of the *Changes*. Similarly, when looking to select one changing line out of six, the sum is divided by six and the remainder gives the selected line.

This process shows that the division operation can be connected to the very action of drawing lots, that is casting one object "randomly" among a limited and defined number of objects. For this reason, the Drawing bamboo sticks method is also presented below as it appears as a mere shortcut of division operations.

A major propriety of remainders is that they can be directly associated to a directory of mantic figures. That such directories are limited to a finite range (64 hexagrams in cleromancy, six or twelve elements in chronomancy) makes them suitable for decision-making and action.

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[5] Homola, "La fabrique des restes"; Homola, "Opérations et manipulations."
[6] On the related mathematical notion of congruence, see Daumas, *Théorème des restes chinois*; on the notion of remain/remainder as a starting point rather than a completion or an outcome, see Malamoud "La notion de 'reste'."

As a consequence of the processes exposed above, computing terms presented below are organized into four sections based on four types of operations: adding up; dividing; manipulating objects; casting/selecting. They pertain to two main semantic fields: mathematics and hand/fingers manipulations. Definitions are mainly based on *Le Grand Ricci Online* (BrillOnline *Chinese Reference Library*). They are not meant to be exhaustive but focus on computing-related meanings. Translations of primary sources are provided selectively on their first occurrence, and extensively in the primary sources part.

Computing Terms of Uncertainty

Adding up

- **加 *jiā* (加起来)**
  to add.
  (Math.) addition.

  [The Small six *ren*—*Xiao liuren* 小六壬]
  从大安上开始起月。月上加日。日上加时。时上加姓。按阴历算。
  From « Great Peace » [position on the finger], add the month. From the month, add the day. From the day, add the hour. From the hour, add the surname. Count according to the lunisolar calendar.

  [Plum-blossom numbers of the *Changes*—*Meihua yishu* 梅花易数]
  首先找出年月日，把它们加起来，相加的总数被 8 除。
  First look for the year, month, and day. Add them together and divide the total by 8.

- **上 *shàng* (上起)**
  to add, to resupply.
  (Math.) to add (an abacus bead) by putting it up the crosswise bar.

  [The Small six *ren*—*Xiao liuren* 小六壬]
  从大安上开始起月。月上加日。日上加时。时上加姓。按阴历算。

  [The Treasure of the Palm—*Yizhang jin* 一掌金]
  年上起月，月上起日，日上起时。男顺行女逆行。

Add month on year, add day on month, add hour on day. Count clockwise for men, counterclockwise for women.

- **總數 *zǒngshù* / 總和 *zǒnghé***
  total, sum

  [The Rice method—*Migua* 米卦法]
  以食指和拇指挾碗中的米粒放在預置的平盤中，一共取出三撮，分別數出每一撮米的總數。
  With the forefinger and the thumb, pick up [a bunch of] grains from a bowl [of raw rice grains] and put them on a plate; do this operation three times; count out separately the total number of grains of each bundle that has been picked up with the fingertips.

  [Plum-blossom numbers of the *Changes—Meihua yishu* 梅花易数]
  首先找出年月日，把它们加起来，相加的总数被 8 除。

Reducing: Counting out and Dividing

- **揲 *shé***
  a. to count serially (ex: by groups of fours)
  b. to take to examine
  c. to accumulate, to pile up.
  (Divin.) to sort out divining stalks

  [The Yarrow ritual—*Shiyi* 筮儀]
  次以右手四揲左手之策。
  Using the right hand, count out the yarrow stalks in the left hand by fours.

- **除 *chú***
  a. to remove, to take out
  b. to discard, to exclude
  (Math.) a. division, to divide. b. to subtract

  [The Rice method—*Migua* 米卦法]
  第一次挾出的米粒總數除以 8，所得餘數即為上卦之數。
  The first number of grains is counted out by 8, the remainder is the number of the upper trigram.

  [Plum-blossom numbers of the *Changes—Meihua yishu* 梅花易数]

首先找出年月日，把它们加起来，相加的总数被 8 除。

[Note the common meaning of 除 *chú*, to remove/discard, and its mathematical meaning, to divide. Whereas it means "to divide" in the Plum-blossom numbers of the *Changes* (*Meihua yishu* 梅花易数) when it applies to *numbers*, it means to "remove", "to count out" in the Rice method (*Migua* 米卦法) when it applies to *objects* (rice grains)].

- **分 *fēn***
  to divide, to share, to separate

  [The Yarrow ritual—*Shiyi* 筮儀]
  乃以右手取其一策，反于櫝中，而以左右手中分四十九策，置格之左右兩大刻。
  Then take out a stalk with the right hand [out of the fifty stalks], return it to the container; with the left and right hands, divide the [remaining] forty-nine stalks and place the two groups on the left and on the right side [of the divining board].

- **餘 *yú***
  remainder, extra, surplus.
  (Math.) remainder after a division.
  (Bouddh.) *youyu* 有餘: which remains to be accomplished / *wuyu* 無餘: without (karma) residue.

  [The Yarrow ritual—*Shiyi* 筮儀]
  次歸其所餘之策，或一、或二、或三、或四，而扐之左手无名指間。
  The stalks that remain, either one, two, three, or four, are placed between the fourth finger and the middle finger of the left hand.

  [The Rice method—*Migua* 米卦法]
  第一次挾出的米粒總數除以 8，所得餘數即為上卦之數。

[餘 *yú* is used to designate both the result of counting out objects (Yarrow ritual, Rice method) and of arithmetic division (Plum-blossom numbers of the *Changes*, although the term is only implicit in the source presented below)].

Manipulating Objects with the Fingers

- **掛 *guà***
  to hang, to suspend

  [The Yarrow ritual—*Shiyi* 筮儀]
  次以左手取左大刻之策執之，而以右手取右大刻之一策，掛于左手之小指間。
  Pick up the group of yarrow on the left side with the left hand, and take a single stalk from the right side with the right hand, place it between the small finger and the fourth finger of the left hand.

- **扐 *lè***
  a. (Divin.) to hold the stalks between the fingers to practice divination
  b. Space between the fingers
  c. 仂 *lè*: (Math.) surplus, excess, remainder, fractional quantity

  [The Yarrow ritual—*Shiyi* 筮儀]
  次歸其所餘之策如前，而扐之左手中指之間。
  As previously, the stalks that remain are placed between the middle finger and the forefinger of the left hand.

[扐 *lè* , along with 揲 *shé*, are the only two terms specifically used in (stalk) divination contexts Interestingly, they combine meanings of mathematical operation (variant 仂 *lè*) and physical manipulation.]

- **挾 *xié***
  to hold between the fingers

  [The Rice method—Migua 米卦法]
  以食指和拇指挾碗中的米粒放在預置的平盤中，一共取出三撮，分別數出每一撮米的總數。

- **撮 *cuō***
  to pick up with the fingertips

  [The Rice method—*Migua* 米卦法]
  以食指和拇指挾碗中的米粒放在預置的平盤中，一共取出三撮，分別數出每一撮米的總數。

- **按 *àn***
  to press with the finger or with the hand

  [The Small six *ren*—*Xiao liuren* 小六壬]
  从大安上开始起月。月上加日。日上加时。时上加姓。按阴历算。

[Note that the term 按 means "pressing with the fingers", which refers here to counting with the thumb around the four other fingers' phalanges.]

- **行 *xíng***
  to circulate, to move

  [The Small six ren—Xiao liuren 小六壬]
  年上起月，月上起日，日上起时。男顺行女逆行。

[Note that 行 refers here to the movement of the thumb counting and revolving around the fingers.]

Casting/Selecting

- **取 / 取出 *qǔ* / *qǔchū***
  to take out, to extract, to draw out

  [The Yarrow ritual—*Shiyi* 筮儀]
  乃以右手取其一策，反于櫝中 (…) 。
  Then take out a stalk with the right hand [out of the fifty stalks], return it to the container (…) 。

  [The Rice method—*Migua* 米卦法]
  以食指和拇指挟碗中的米粒放在預置的平盤中，一共取出三撮，分别数出每一撮米的總數。

  [Drawing bamboo sticks—*Qiuqian* 求籤]
  用右手差動竹策，差動後分三次取籤，作爲上卦與動爻。
  Using the right hand, the practitioner stirs the [eight numbered] bamboo sticks [contained in a bamboo cylinder]. After stirring the sticks, he will draw a divination stick three times so as to determine the upper trigram, the lower trigram and the changing line of the hexagram.

Illustration

Fig. 4: Hand diagram excerpted from a recent edition of *Damo yizhangjin* 達摩一掌金 (Bodhidharma's Treasure of the Palm) attributed to Monk Yixing from the Tang dynasty (Yixing 釋一行. *Kanming yizhangjing* 看命一掌經 [Classic of Fate Auscultation in the Palm]. No place of publication: 2).

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[The primary sources below do not present the techniques exhaustively but only focus on the computing parts of each technique.]

The Yarrow ritual—*Shiyi* 筮儀 (cleromancy)

Reference:
Zhu Xi 朱熹. 1979. “Shiyi 筮儀” (The Yarrow ritual). In *Zhouyi benyi* 周易本義 [The Original Meaning of *Zhouyi*]. Taipei: Xinwen chuban gufen youxian gongsi (1a–5a). http://ctext.org/library.pl?if=gb&file=141045&page=111 (p. 111–120)

[The yarrow ritual is based on the recurring processing of fifty yarrow stalks. The process involves counting out stalks by fours to determine remainders which are then processed (added) together so as to designated successively the six lines of a hexagram. First, the practitioner takes the bundle of fifty yarrow with both hand.]

> 乃以右手取其一策，反于櫝中，而以左右手中分四十九策，置格之左右兩大刻。
>
> Then take out a stalk with the right hand [out of the fifty stalks], return it to the container; with the left and right hands, divide the [remaining] forty-nine stalks and place the two groups on the left and on the right side [of the divining board].
>
> 次以左手取左大刻之策執之，而以右手取右大刻之一策，掛于左手之小指間。
>
> Pick up the group of yarrows on the left side with the left hand, and take a single stalk from the right side with the right hand, place it between the small finger and the fourth finger of the left hand.
>
> 次以右手四揲左手之策。
>
> Using the right hand, count out the yarrow stalks in the left hand by fours.
>
> 次歸其所餘之策，或一、或二、或三、或四，而扐之左手无名指間。
>
> The stalks that remain, either one, two, three, or four, are placed between the fourth finger and the middle finger of the left hand.
>
> 次以右手反過揲之策於左大刻，遂取右大刻之策執之，而以左手四揲之。
>
> With the right hand, return the yarrows counted out [by fours] to the left side, take the yarrows on the right side and count them out by fours with the left hand.

次歸其所餘之策如前，而扐之左手中指之間。

As previously, the stalks that remain are placed between the middle finger and the forefinger of the left hand.

一變所餘之策，左一則右必三，左 二則右亦二，左三則右必一，左四則右亦四。通掛一之策，不五則九。五以一其四而為奇，九以兩其四而為偶，奇者三而偶者一也。

Among the possible remaining stalks, if the remainder from the left side is one, then the remainder form the right must be three, if the remainder from the left side is two, then the remainder form the right must be two, if the remainder from the left side is three, then the remainder form the right must be one, if the remainder from the left side is four, then the remainder form the right must be four.

[In this first operation, the total number of stalks placed between the fingers of the left hand is either five or nine. The whole operation is repeated twice, but without the single stalk placed between the small finger and the fourth finger, so that the total number of stalks placed between the fingers in each of these two operations is either four or eight.]

掛扐之數，五、四為奇，九、八為偶。掛扐三奇合十三策，則過揲三十六策為老陽。

Among the [total] number of stalks placed between the finger [either 4, 5, 8 or 9], five and four are odd, nine and eight are even. If three odds have been placed between the fingers [5+4+4], it amounts to thirteen stalks, thirty-six stalks have been counted out by fours (?), and the line of the hexagram is designated “old *yang*” [changing *yang* line].

[This three-fold operation is repeated five times so as to determine the six lines of the hexagram.]

The Rice Method—*Migua* 米卦法 (Cleromancy)

Reference:
Ruli Jushi 如理居士. 2007. *Baihua weilai yuzhishu* 白話未來預知術 [Method to predict the future in vernacular language]. Taipei: Haixin tushi, p. 16.

以食指和拇指挾碗中的米粒放在預置的平盤中，一共取出三撮，分別數出每一撮米的總數。

1. 第一次挾出的米粒總數除以 8，所得餘數即為上卦之數。

2. 第二次挾出的米粒總數除以 8，所得餘數即為下卦之數。
3. 第三次挾出的米粒總數除以 6，所得餘數即為動爻之數。

With the forefinger and the thumb, pick up [a bunch of] grains from a bowl [of raw rice grains] and put them on a plate; do this operation three times; count out separately the number of grains of each bundle that has been picked up with the fingertips.

1. The first number of grains is counted out by 8, the remainder is the number of the upper trigram [based on a conventional numbering of trigrams from 1 to 8].
2. The second number of grains is counted out by 8, the remainder is the number of the lower trigram.
3. The third number of grains is counted out by 6, the remainder is the number of the changing line [one of the six lines of the hexagram].

Drawing Bamboo Sticks—*Qiuqian* 求籤 (Cleromancy)

Reference:
Ruli Jushi 如理居士. 2007. *Baihua weilai yuzhishu* 白話未來預知術 [Method to predict the future in vernacular language]. Taipei: Haixin tushi, p. 18.

1. 用右手差動竹策，差動後分三次取籤，作爲上卦與動爻。
2. 第一次差動八支竹策，順勢取出一支，看號碼幾號，記下，作爲上卦。隨後將籤支放回籤筒。
3. 第二次差動八支竹策，再順勢任意取出一支，看號碼幾號，記下，作爲下卦。隨後將籤支放回籤筒。
4. 取出籤筒内七號和八號竹策，置於桌上，餘下六支 （一至六號），作爲動爻參數。
5. 第三次差動籤筒内六支竹策，任意取出一支，看是幾號，記下，作爲所求之卦的動爻。

1. Using the right hand, the practitioner stirs the [eight numbered] bamboo sticks [contained in a bamboo cylinder]. After stirring the sticks, he will draw a divination stick three times so as to determine the upper trigram, the lower trigram and the changing line of the hexagram.
2. The first time, the practitioner stirs the eight bamboo sticks and draws one stick out without extra trouble (?). He looks at the number, memorizes it: it designates the upper trigram. Then he puts the divination stick back in the cylinder.
3. The second time, the practitioner stirs the eight bamboo sticks and draws one stick out again without extra trouble (?). He looks at the number, memorizes it: it designates the lower trigram. Then he puts the divination stick back in the cylinder.
4. The practitioner takes the sticks numbered seven and eight out of the cylinder and put them on the table. Only six sticks remain

(numbered from one to six), they will designate the parameter of the changing line.

5. The third time, the practitioner stirs the six bamboo sticks contained in the cylinder, draws one stick out without extra trouble (?), looks at the number, memorizes it: it designates the changing line of the selected hexagram.

The Small six ren—*Xiao liuren* 小六壬 (Chronomancy)

Reference:
Pan Tongjue 潘统觉 (ed.). 2010. *Duyitang tongshu* 读易堂通书 2010 (Almanac of the *Yi* reading hall 2010). Zhejiang: (no publisher name), p. 4.

从大安上开始起月。月上加日。日上加时。时上加姓。按阴历算。

From « Great Peace » [position on the finger], add the month. From the month, add the day. From the day, add the hour. From the hour, add the surname. Count according to the lunisolar calendar.

The Treasure of the Palm—*Yizhang jin* 一掌金 (Chronomancy)

Reference:
Yixing 釋一行. 1995. *Damo yizhangjin* 達摩一掌金 (Bodhidharma's Treasure of the Palm). Taizhong: Ruicheng shuju, p. 2.

年上起月，月上起日，日上起时。男顺行女逆行。

Add month on year, add day on month, add hour on day. Count clockwise for men, counterclockwise for women.

Plum-blossom Numbers of the Changes—*Meihua yishu* 梅花易数

Reference:
Interview with M. Tang, an amateur diviner, Kaifeng, 2010.
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首先找出年月日，把它们加起来，相加的总数被 8 除。然后记下来，为天干。再把年月日时加起来，相加的总数被 8 除，记下来，为地支。把天干地支合在一起看是否相生。然后再把天干地支的总和加起来被 6 除，找出动爻看是否相生。这样才能算数真正的吉凶。首先应该把这个符号研究，直到它们的作用和意义，对告拆卦很有帮助。 这种方法能测万事万物。

First look for the year, month, and day. Add them together and divide the total by 8. Remember the result [the remainder of the division], it designates the Heavenly Stem [meaning here the upper trigram of the

> hexagram]. Again, add the year, month, day, and hour, divide the total by 8. Remember the result [the remainder of the division], it designates the Earthly Branch [here the lower trigram]. Compare the Stem and the Branch and see if they engender one another or not [according to the doctrine of the five phases]. Then, add the numbers of the Stem and the Branch and divide the total by 6. The result designates the changing line of the hexagram. See if the new trigrams engender one another or not. It is only in doing so that one can compute genuine good and bad luck. One should first study these symbols, their use and meaning. They are very useful to understand hexagrams. This method allows the prediction of anything.

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Adapting Environmental Relations in Seventeenth- and Eighteenth-Century China in Terms of Locust Uncertainty

David A. Bello[1]

Conceptual Issues: Uncertainty, Prediction & Planning, Environment

Terms have been selected to establish a context of locust uncertainty, here considered to exemplify the larger category of environmental uncertainty, during the first half of China's Qing dynasty (1644–1912). Along with flood and drought, locusts were considered one of the three main causes of "serious famine" by traditional authorities concerned with the management of China's agrarian empire.[2] Consequently, locust control measures, like water control measures, were taken seriously by successive Chinese governments for reasons of food security and, by extension, revenue and legitimacy. As the terms collectively establish, however, such control was subject to considerable uncertainty generated by the dynamic interaction of humans with their surroundings.

"Uncertainty" is, consequently, experienced by humans as a lack of predictability for purposes of, ideally absolute, state control of non-human ecological systems. The state normally conceives of any persistent uncertainties in anthropogenic terms that center on official malfeasance and peasant ignorance. In qualified contrast, society's perspective often appears, indirectly, to be a locust uncertainty manifesting economic and religious concerns. There is, consequently, a range of locust "uncertainties" that emerge. The origin of some, such as climate, are substantially ecological; others, such as jurisdictional responsibility for an outbreak, substantially social. In practice, however, the ecological interacts with the social to form a larger environmental uncertainty encompassing both.

Prediction and planning are complicated precisely because locust uncertainty is composed of elements of these relations subject to state control, some comparatively less (ecological as climate), some of comparatively more (social as personnel administration). Under conditions of environmental uncertainty, the terms

[1] Washington and Lee University/IKGF/FAU

[2] Xu Guangqi, *Nongzheng quanshu jiaozhu*, 1299.

may be understood as cultural expressions in response to an ecological process that is only partly socially constructed and, therefore, only partially subject to prediction and planning, which are, nevertheless, fundamental human adaptations to all uncertainties. Chinese imperial administration could not wholly reduce locust uncertainty to a "people problem" of personnel management or peasant superstition, regardless of the concepts it employed. To the degree that it could not effect such a reduction, imperial state control became environmentally uncertain.

Locusts were the main source of this environmental uncertainty in their behavioral "resistance" to planning and prediction as well as in the way this behavior was formed by ecological factors like climate. A recent anthology concerned with "the termination of anthropocentrism in ethics, politics, and throughout a range of academic disciplines," has made a strong case for "the inclusion of animals into social studies" because it compels analysts to seriously consider "the eradication of the distinction between the social and the natural and instead adopt the idea of heterogeneous networks and fluidity when approaching social life." From this perspective, "any given entity is conceived as such only through its interrelations with other entities, so "society is emergent and performatively constructed by the relational interactions of its members," not all of which need be human-determined.[3] Indeed, there would be little need for prediction and planning beyond the anthropological and sociological bounds of human interrelations if these alone constituted human experience.

Prediction & Planning for Locust Uncertainty in Practice

Considered collectively as a manifestation of a type of environmental uncertainty, the terms presented here are products of human relations with locusts, mediated through human relations with cereal cultivars, under a changing climate that simultaneously informs further human interrelations. These terms are representative of the larger terminology of locust uncertainty through which any pertinent state discussion would be expressed during this period, when the state regime of locust control is considered to have fully matured. Qing eradication protocols were the most comprehensive iteration of multi-dynastic administrative adaptation stretching back centuries to the

[3] Boddice, "The End of Anthropocentrism," 1; Taylor, "Anthropomorphism," 272.

Tang period (618–907).[4] This highly articulated system of locust eradication formed the basis for the expectations and frustrations expressed by the Qianlong emperor (r. 1736–95) in the entry, Flying Locusts/c. The emperor's statement reflects a representative official conviction that once locusts took flight, control—critically, of both insects and humans—became more difficult. Among other administrative problems, flying locusts could encourage key local administrative elements to increase, rather than reduce, human uncertainty, particularly by obscuring the jurisdictional origin of the outbreak. Qing eradication administration assumed the emergence of flying locusts could be traced back to a single jurisdiction to prove it had failed to implement proper pre-emptive eradication protocols, which included inspection for locust egg deposits and sometimes even reproductive habitat destruction. Such mechanically anthropogenic assumptions, which tend to reduce complexity inherent in environmental relations to administratively accessible issues of human malfeasance, are characteristic not simply of Qing administrative institutions, but of human institutions transhistorically.

Collectively, the terms delineate some of the fundamental boundaries of contemporary state adaptation of its agrarian environmental relations with cultivars and cultivators in terms of locust uncertainty. Term #1, "short period of drought," indicates uncertainty regarding the ecological element believed to be the main climatic prerequisite and predictor for a locust outbreak. Term #2, "laying eggs," is the uncertainty that is the corresponding biological element needed for an outbreak. Term #3, "flying locusts," is the embodiment of a fully-fledged biological uncertainty at the core of the context under examination here because it is the maximum point of instability for effective locust control, which is much easier to effect against wingless immature locusts that cannot swarm (i.e. they cannot travel far and do not seriously threaten crop fields). Anthropogenic uncertainties, exemplified by term #4, "rustic foolish/ignorant commoners," are then triggered by these prior ecological dynamics to further destabilize locust eradication. This cultural response creates tension between humans, who cannot agree on a unified response because they are divided by both material and spiritual interests articulated only as a result of locust activity.[5] This

[4] Zhang Yihe, *Zhongguo huangzai shi,* 206–12.
[5] Elite dismissal of popular belief was inconsistent, if certainly pronounced in many eradication memorials. For example, North China proliferation of General Liu Meng

conflicted response to an ecological event environmentally spreads uncertainty in a cascade from weather and insects to people, a process also visible in jurisdictions' attempts to avoid state blame as the originating locales of a multi-jurisdictional plague. The main state adaptation to this context of locust uncertainty affecting Qing environmental relations with cereals is term #5, which is not always expressed in precisely the words "disaster relief/disaster readiness." The emperor's preference for "disaster readiness" rather than "disaster relief" is nevertheless one variant version of a structural imperative that seeks to preclude uncertainty, thereby rendering the whole process "unnaturally" subject to human control. In this respect, environmental uncertainty permeates even the most robust assertions and structures of human institutional certainty.

The Biological Dimensions of Locust Uncertainty

The biology of locust developmental behavior is the ecological prerequisite for locust uncertainty. The process whereby solitary grasshoppers are transformed into gregarious locust swarms, with a commensurate expansion in the insect's voracity and consequent historical significance, is governed by many external relational factors that may be abbreviated here as a kind of climate-habitat synergy.

One critical climate-habitat factor—alteration of flood and drought at varying scales within a set range—has a determining effect on locust reproduction. Shores at the fluctuating margins bodies of water constitute an ideal spawning ground. Soil that might otherwise be too dry becomes sufficiently damp for egg-laying while soil that might otherwise be too wet becomes sufficiently dry, a kind of terrestrial "Goldilocks zone" for breeding locusts. Although there is considerable variation among current explanations of just how cycles of flood and drought stimulate locust reproduction, there is evidence to suggest that the highest rates of outbreaks at decadal intervals of *L.m. manilensis* (or, the Oriental Migratory Locust)—arguably the most historically significant locust subspecies native to China proper—occurred when both drought and flood frequencies peaked in the central regions of the lower reaches of the Yellow and Yangzi rivers. Furthermore, some evidence suggests that periods of flood and drought increase when climate becomes colder and wetter, as it did for much of the

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shrines to ward off locusts was actively promoted by the Yongzheng emperor; Wang Jiange, "Qingdai Huabei," 105.

Qing domain, during the Little Ice Age (c. 1400–1900).[6] If this evidence is correct, the Qing period "naturally" saw one of China's highest peaks in locust plagues effectively driven by ecological forces beyond human control. This is confirmed in a qualified way by extant outbreak records that exceed those of any other dynasty, but that are, problematically for comparative purposes, also much more complete than those of any other dynasty.[7]

Locusts, moreover, are not born through climate alone. Crowding, which stimulates the onset of density-determined phase polymorphism, is the most immediate trigger for locust development. This transformation is experienced by only a few subspecies of grasshoppers. As they come into close contact, touch-sensitive chemical receptors on the insects' hind legs release the neurotransmitter serotonin that, along with other physical stimulants that include the sight and smell of other developing locusts, induces swarming. This behavioral change is accompanied by equally dramatic physical changes that endow crawling, hopping insects with wings that can carry them hundreds or even thousands of kilometers.[8]

Aspects of locust biology clearly influenced the development of the terminology of locust uncertainty, such as "short period of drought." An extended example, from Chen Chongdi's 1874 agricultural manual on locust control, of the influence of what appears as climate-driven density-determined phase polymorphism shows how ecological dynamics shaped human adaptive responses under conditions of environmental uncertainty:

> All methods of controlling them must be divided into three stages: when they are eggs that have yet to hatch; [when] they hatch as immature locusts; [when] they grow wings to become locusts. To control locusts is not as easy as controlling immature locusts, which is, [in turn,] not as easy as controlling the eggs. Likewise, controlling them after a drought has already developed is not as easy as controlling them when floods recede. This, moreover, is no more than clearing them out at their source. Thus, it is said that the offspring of locusts begin in water and mature in drought.

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[6] Stige et al., "Decadal Locust Dynamics"; Zhang Zhibin et al., "Periodic temperate-associated drought/flood."
[7] For Qing outbreak statistics that cover a 195-year period from 1644 to 1839, see Li Xiangjun, *Qingdai huangzheng yanjiu*, 214.
[8] Simpson and Sword, "Locusts," 365.

> Those who are concerned to deal with this distress of the people should do so in its early stages.[9]

As demonstrated by this example—which can stand as a basic summary of the principles of Late Imperial locust control—human planning was inextricably conditioned by locust biology. Three images from Chen's manual concisely illustrate the proper execution of this plan (Figs. 5a and 5b) and the disruptive consequences of its belated implementation (Fig. 5c). More importantly, together they depict the inherent conditioning of human agrarian practice by ecological processes of both plants and animals:

Fig. 5a : "Locust Egg Control"
Chen Chongdi, 1874, unpaginated
between 9b and 10a

Fig. 5b: "Catching Immature Locusts"
Chen Chongdi, 1874, unpaginated
between 12b and 13a

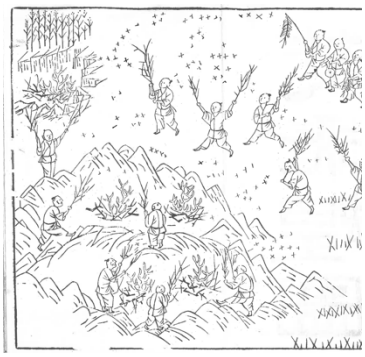

Fig. 5c: "Burning Flying Locusts"
Chen Chongdi, 1874, unpaginated
between 16b and 17a

The first stage of locust control in figure 5a requires deforestation, based on the traditional consensus among imperial commentators that locust eggs were originally fish or shrimp eggs laid among aquatic plants that could mutate into locust eggs when drought dried out watery margins just enough.[10] At stage two, locusts are literally combed crawling and hopping from the fields they have infested by regimented farmers (Fig. 5b). In the final stage, they are seen in flight from humans wielding branches trying to drive them into fire pits (Fig. 5c).

The extent to which these control procedures were actually implemented is unclear. There were certainly objections to such elaborate plans expressed in terms of the human conflicts they could create. Peasant reluctance was chief among them, as

[9] Chen Chongdi, *Zhihuang shu*, 2a–b.
[10] For an authoritative synopsis, see Xu Guangqi, *Nongzheng quanshu jiaozhu*, 1301–02.

embodied in both "rustic foolish/ignorant commoners," and agrarian pragmatists, as entry b to this term (on page 78 below) partially attests.[11]

Whatever the uncertainties involved, at all stages of Chen's proposed operation, human regimentation and its organizational planning are primary cultural responses to the ecological dynamics of locust development. What clearly emerges is a set of more heterarchical relations between humans and animals that can be traced in the exemplary terms of locust uncertainty to which humans had to adapt.

The Terms of Locust Uncertainty

Please note: all references below are from *The Veritable Records of the Qing Dynasty* (*Qingshilu*; 清史录 abbreviated below as *QSL*) followed by the Qing reign periods of the Kangxi (康熙) and Qianlong (乾隆) emperors (abbreviated below as KX and QL, respectively) followed by the traditional year/month/day of the entry. This source, the dynasty's single most comprehensive annalistic record, was chosen for the representative character of its state administrative discourse.

少旱/微旱: Short Period of Drought

a. KX 32/10/9 (*QSL*, 5: 758b–59a): 闻山东今年田收之后，九月中蝗蜮丛生，必已遗种于田矣。而今岁雨水连绵、来春少旱、蝗则复生、未可知也．．．尽耕其田、庶几蝗种瘗于土而糜烂，不复更生矣。
[We] have heard that in Shandong after this year's harvest there was an outbreak of locusts and caterpillars during the ninth month, and they are sure to have already laid their eggs in the fields. Furthermore, there has been continuous rain this year. It is yet unknown whether come spring there will be a short period of drought, so the locusts will spawn again . . . These fields will be thoroughly plowed so that any eggs possibly laid buried in the soil will rot away and regenerate no more.

b. KX 33/4/13 (*QSL*, 5: 780b): 昨岁因雨水过溢，即虑入春微旱。蝗虫遗种，必致为害．．．今时已入夏恐蝗有遗种在地，日渐蕃生。
Last year, because rain was excessive, there was consequently a concern about a slight drought upon the entry of spring such that locusts would lay their eggs, inevitably resulting in disaster . . . Now that summer has already arrived, it is feared that locusts may have laid eggs in the soil that will steadily hatch in great numbers.

c. KX 34/1/23 (*QSL*, 5: 805b):去岁雨水连绵，今岁春时若或稍旱，蝗所遗种，至复发生， 遂成灾沴，以困吾民，未可知也。凡事必豫防而备之。

[11] A representative example of such objections is metropolitan censor Dou Guangnai's late eighteenth-century memorial in He Changling, *Qing jingshi wenbian*, 447–50.

Last year it rained continuously. It is as yet unknowable whether or not a slight drought may perhaps occur this spring so that the eggs left behind by locusts hatch anew to then become a disaster from the imbalance of yin and yang to the distress of our people. It is imperative that all aspects of this situation be anticipated and prepared for.

遗种: Laying Eggs

a. KX 32/10/9 (*QSL*, 5: 758b–59a): 闻山东今年田收之后，九月中蝗螟丛生，必已遗种于田矣。而今岁雨水连绵、来春少旱、蝗则复生、未可知也．．．尽耕其田、庶几蝗种瘗于土而糜烂，不复更生矣．．．若郡县有不能尽耕其田者，蝗或更生。
[We] have heard that in Shandong after this year's harvest there was an outbreak of locusts and caterpillars during the ninth month, and they are sure to have already laid their eggs in the fields. Furthermore, there has been continuous rain this year. It is as yet unknown whether come spring there will be a short period of drought, so the locusts will spawn again . . . These fields will be thoroughly plowed so that any eggs possibly laid buried in the soil will rot away and regenerate no more . . . Should any sub-provincial locales be unable to plow up their fields completely, some locusts may yet regenerate.

b. KX 33/4/13 (*QSL*, 5: 780b): 昨岁因雨水过溢，即虑入春微旱。蝗虫遗种，必致为害．．．今时已入夏恐蝗有遗种在地、日渐蕃生。
Last year, because rain was excessive, there was consequently a concern about a slight drought upon the entry of spring such that locusts would lay their eggs, inevitably resulting in disaster . . . Now that summer has already arrived, it is feared that locusts may have laid eggs in the soil that will steadily hatch in great numbers.

c. KX 34/1/23 (*QSL*, 5: 805b): 去岁雨水连绵，今岁春时若或稍旱，蝗所遗种，至复发生，遂成灾沴，以困吾民， 未可知也。凡事必豫防而备之．．．速行文直隶，山东，河南，山西，陕西，江南 诸巡抚，亟宜耕耨田亩。
Last year it rained continuously. It is as yet unknowable whether or not a slight drought may perhaps occur this spring so that the eggs left behind by locusts hatch anew to then become a disaster from the imbalance of yin and yang to the distress of our people. It is imperative that all aspects of this situation be anticipated and prepared for . . . swiftly notify the governors of Zhili, Shandong, Henan, Shanxi, Shaanxi and Jiangnan that they should immediately plow up and weed out their acreage.

飞蝗: Flying Locusts

a. KX 25/6/12 (*QSL*, 5: 347b–48a): 上又问曰，彼处及江南一路田苗若何。近京一带，飞蝗为虐果甚否。麻尔图奏曰，沿途一带禾苗俱佳。据百姓云，蝗生不久飞去，尚不为灾。

The Emperor also asked what the condition of the sprouts in the fields of those places [Fengyang and Xuzhou] and throughout the Jiangnan circuit was and whether or not the flying locusts could really become a serious disaster in the Nanjing region. Ma-er-tu reported that along the road the grain was all fine. According to what the commoners said, the locusts had all flown off not long after they were born so that there was as yet no disaster.

b. QL 7/3/12 (*QSL*, 11: 44a): 江省上年蝗蝻甫生。即扑灭净尽。间有外省飞来。关查未得确实．．．且有随风旋入。难定方向者．．．一有飞。严行查参。不得籍口日久支饰。
Last year immature locusts that had just hatched in Jiangsu province were completely wiped out at once. Sometimes they fly in from other provinces, but investigation has not yet confirmed this . . . Furthermore, the wind was shifting around in such a way as to make it difficult to determine its direction . . . As soon as they fly, there must be a stringent investigation and punishment with no pretexts for delay or cover-up.

c. QL 9/10/13 (*QSL*, 11: 928b–29a): 今据尹继善等奏称，今岁蝗蝻所生甚广．．．凡州县官，一见飞蝗。即图卸责。诿之邻省。是其积习。节据各属禀报，飞蝗自北而来者。不一而足。臣等严加申饬。不许互相推诿。作速扑灭．．．请免查参等语。尹继善等此奏。甚属错谬。从来捕蝗之法。全在初生之时。竭力剿除。庶不致蔓延为害。今江南蝗蝻，既经飞入邻省。则该地方官，捕治不力。罪无可辞。乃反称自北而来。此即图卸己责，诿咎邻封之陋习。且邻境已受飞蝗之害。
Now, according to Yin-ji-shan et al.'s memorial, it states that 'this year locusts have hatched over an extremely broad area . . . As soon as they see flying locusts, all department and district officials thereupon seek to evade responsibility and lay blame on neighboring provinces. This is their long-standing practice. According to excerpts of various reports from local jurisdictions, the flying locusts come from the north and are innumerable. Your servants issued strict warning that mutual blame will not be permitted and to conduct rapid eradication . . . It is requested that investigation and punishment [of official malfeasance] be suspended.'

This memorial of Yin-ji-shan et al.'s is a categorical error. The method of catching locusts relies entirely on making maximum efforts to eradicate them soon after they hatch, so as not to allow them to spread and become a disaster. Currently, Jiangnan's locusts have already flown into neighboring provinces. So, local officials there [in Jiangnan] who were lax in their efforts to control them have committed an unpardonable crime. There is also, moreover, the counter-statement that they came from the north. This is, namely, the corrupt practice of attempting to shift responsibility to blame a neighboring jurisdiction. Furthermore, the disaster of flying locusts has already struck neighboring areas' borders.

草野愚/无知民: Rustic Foolish/Ignorant Commoners

a. KX 33/4/13 (*QSL*, 5: 780b): 或有草野愚民，往往以蝗不可捕，宜听其自去者。此等无知之言尤宜禁止。捕蝗弭灾全在人事。应差户部司官一

员，宣谕直隶山东巡抚令申饬，各州县官员，亲履陇亩，如某处有蝗，即率民撙捕，无使为灾。
There are some rustic foolish commoners who frequently hold that locusts cannot be caught and should be allowed to leave on their own. Particularly this sort of ignorant talk should be in prohibited. The capture of locusts to quell disaster lies entirely within human affairs. An official of the Board of Revenue should be dispatched to promulgate a decree that the Zhili and Shandong Governors-general are to order the officials throughout their jurisdictions to personally walk the acreage. Should there be any place with locusts, the people should promptly be directed to seize them so as to prevent disaster.

b. QL 17/5/20 (*QSL*, 14:433b–34a): . . . 蝗蝻生发。惟当极力驱除。乡民无知虽悬赏不肯即报。推求其故。恐派夫蹂躏。徒事烦扰。惟信刘猛将军之神。祈禳可免。愚说实不足凭 ． ． ． 得旨、所见甚正。然民情亦当顺之。彼祀神固不害我之捕蝗也。若不尽力捕蝗、而惟恃祀神。则不可耳。
. . . There was an outbreak of locusts necessitating energetic eradication. The villagers are ignorant and, although a reward was offered, they were unwilling to quickly report [the outbreak]. An inquiry into their reasons was made [and found] they feared men dispatched [to catch locusts] would trample crops, which would only serve to create a disturbance. They believe solely in the spirit of General Liu Meng and pray to him to avoid the disaster, which I humbly in truth consider insufficiently reliable . . . An imperial directive was received, stating that ‘these views are quite correct; however, commoners’ feelings should also be soothed. This spirit worship certainly does no harm to our catching locusts, but it is simply impossible to rely solely on spirit worship if their capture is not effected with the utmost energy.’

救荒/备荒: Disaster Relief/Disaster Readiness

a. KX 25/6/4 (*QSL*, 5: 345b–46a): 上曰，朕自即位以来，二十余年，凡民间之事，留心体访，稍知情状。古人不言救荒而言备荒。故三年有一年之蓄。九年有三年之蓄。虽间值水旱，小民不致失所。去岁可谓丰年。设今岁不登，即致饥馑。总由素无蓄积耳。
The Emperor stated: “In the more than twenty years since We ascended the throne, [We have been] making personal inquiries and been keeping in mind all the affairs of the populace so as to know their circumstances in detail. The people of old did not speak of disaster relief, but of disaster readiness. So, a provision for one year was reserved in every three; in every nine years, a provision for three years. So, although a flood or drought might sometimes happen to occur, the commoner experiences no loss. Last year could be called a bumper harvest, but if crops do not ripen this year, famine will promptly result. This is in sum only because there are no stockpiles at all.”

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Terminology of Uncertainties: Earthquake Prediction in (Modern) Japan

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Scientists working on earthquake prediction (*jishin yochi* 地震予知) in modern Japan have struggled with how to describe the uncertainties inherent in the phenomenon itself and in their understanding of it in ways that policy makers and the public could easily grasp. This glossary entry explores one of the rhetorical strategies that Japanese earth scientists used to explain how prediction might be performed in practice. In the late 1970s, as the nation prepared for earthquake prediction's evolution from theoretical possibility to a practice with real world implications, scientists turned to familiar images from the game of baseball for analogies to the decisions they would be called on to make as disaster experts. This contribution to the glossary will unpack some of the implications of this approach to accounting for uncertainty.[2]

By the 1970s, the Japanese scientists most active in earthquake prediction efforts were careful to distinguish between long-term and short-term predictions in their encounters with policy makers and the public. Long-term predictions focused on powerful (usually M7 or greater), potentially destructive earthquakes, defined the likely hazard zone on a prefectural or multi-prefectural scale, and spoke of events that were thought to be years or decades in the future. These predictions were based on records of past earthquakes, studies of known fault zones, and from the late-1960s on a growing understanding of the implications of plate tectonics theory for seismicity in Japan. For policy makers, long-term predictions were useful for thinking about building standards, evacuation planning, and disaster recovery efforts more broadly, even if they were less directly helpful to the public at large.

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[2] Scientists used other analogies as well. Takeuchi Hitoshi (University of Tokyo) asked his readers to imagine a piece of string stretched taut until it snapped; earthquake prediction, he said, was like claiming to know ahead of time exactly where on the length of string it would break, and when it would do so (in "Jishin retto," 10). Ishibashi Katsuhiko (University of Tokyo Earthquake Research Institute) asked his audience to imagine waiting for the Joker to turn up in an almost fully-dealt deck of cards to make a point about probability and predicting a Tōkai earthquake, see Ishibiashi Katsuhiko, "'Zenchō' kyacchi banzen o," 21; "Surugawan jishinsetsu."

Short-term prediction efforts were different. They were directed at a small sub-set of the earthquakes that were already targeted as candidates for long-term prediction. Some scientists believed that major, destructive events would be preceded by subtle but potentially detectable changes across a range of indicators in proximity to the fault zone. These might include shifts in the frequency of micro-earthquakes, in tilting or other motions at or near the earth's surface, or abrupt shifts in measured levels of strain in the bedrock in at-risk regions. If experts watching the data from the instruments monitoring these sites saw signs indicating that an earthquake was imminent, it was hoped that the warnings that followed would ideally give local governments and institutions enough time to put previously laid disaster prevention plans into action.

Japanese scientists were by no means the only ones who were optimistic about short-term earthquake prediction in the 1970s. Well-regarded researchers in the U.S., the Soviet Union, and elsewhere increasingly spoke of short-term prediction as if it were almost within reach. Plate-tectonics theory had addressed so many of the field's questions that there was good reason to think that the barriers to prediction would fall in due course.[3] A growing number of reports of successful short-term predictions only added to the sense of rapid forward momentum. Shortly after the powerful Haicheng Earthquake in February 1975, for example, Chinese officials announced that scientists there had not only accurately predicted the earthquake, but that they were also responsible for the evacuation order that had gone out just hours before the earthquake struck. According to reports coming in from the region, many, many lives had been saved as a direct result of their actions.[4] For earth-scientists in Japan (and presumably in the U.S. too), it was almost a given that if China's relatively poorly funded research infrastructure could produce such a result, then their own, much more sophisticated programs could also do so.

Japan explicitly embraced short-term earthquake prediction as a key component of its disaster prevention strategy in the form of the Large-Scale Earthquake Countermeasures Act (*daikibo jishin taisaku tokubetsu sochihō* 大規模地震対策特別措置法), LECA, which was proposed by the government in early 1978 and ratified by legislators soon afterwards. The Act was a direct response to mounting fears that a massive M8 earthquake was poised to

[3] See Hough, *Predicting the Unpredictable*.
[4] The events leading up to the evacuation order, and the nature of the prediction itself, were not as straightforward as the accounts coming out of China at the time suggested. Wang Kelin et al., "1975 Haicheng Earthquake."; Fan Fa-ti, "'Collective Monitoring, Collective Defense'."

strike Japan's Tōkai district, and could do so at any time. The stakes of such an event were staggeringly high; the district was vital to the nation's industrial and transportation infrastructures, and home to close to 13 million people in the mid-1970s. Should the earthquake occur in the manner and on the same scale that scientists anticipated it would, the number of dead in Shizuoka Prefecture alone was expected to exceed 10,000. That number would rise significantly if deaths due to the earthquake's secondary hazards—tsunami, train derailments and so on—were also taken into account.[5]

The new law gave the national and local governments tools policy makers hoped would help mitigate some of the hazards associated with a Tōkai Earthquake. Under its provisions, for example, officials could preemptively order the evacuation of hospitals, schools, and other public spaces, bring most rail and road transportation in the affected region to a standstill, shut down or curtail hazardous industrial processes, and invite the SDF to pre-position supplies and personnel, all in anticipation of the earthquake to come. The fundamental premise of the law was that short-term prediction was possible; none of its interventions made sense otherwise. For the moment, it was understood that prediction in this form was possible only for the Tōkai Earthquake, and that the Act applied solely to those communities at risk of major harm because of it. Even with those limits in place, however, it was clear that a threshold had been crossed. From the moment the Act went into effect, the state's assurances that it would warn and protect the millions of people threatened by a Tōkai Earthquake were based almost entirely on the judgment of a half-dozen earthquake scientists, who together made up a newly constituted Hanteikai Prediction Council.[6] They were the ones who would assess any anomalous data from the instruments monitoring the district, and decide if that information meant that an earthquake was imminent, or not. There was no middle ground available to them; the Council's members could either issue a warning (and thus invite the Prime Minister to act) or they could decline to do so. They could not express their understanding of what the anomalous data meant in probabilistic terms, or indicate degrees of confidence in their conclusions.

Uncertainty was a factor at almost every stage of the process on the way to an earthquake warning. Even if one accepted the validity of reports that experts in China had

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[5] February 16, 1978, Saigai taisaku tokubetsu iinkai, Session 4, 84th Diet, Lower House, p.18.

[6] For an English-language version of the text, see Rikitake Tsuneji, *Earthquake Forecasting and Warning*, 343–360.

successfully predicted the 1975 Haicheng earthquake hours before it occurred, and saved many lives by doing so, no one had ever made a successful short term-prediction based on the assumptions and data that scientists in Japan were relying on. Some of those scientists were more confident than others that an earthquake as powerful as the one expected to hit the Tōkai region would always be preceded by precursory phenomena. Others acknowledged that it might not be, in which case there might be nothing for scientists to observe before the event itself was underway, and no warnings given. Also, if precursory phenomena were in fact present, would observers recognize them for what they were in time, and sound the alarm? Could they know the difference between unusual instrument readings that were entirely benign and others that existed only because of the earthquake that was about to occur? As debate over the merits of the LECA and the limits of prediction unfolded in the late 1970s, the earthquake experts turned to baseball to explain their dilemma, and how it might play out, in imagery familiar to almost everyone.

Scientists at Bat: Analogies from Baseball as Discursive Strategies

The experts whose job it was to predict the next Tōkai Earthquake expected to make mistakes. They made no secret of this, and in Diet testimony and other public-facing settings frequently described scenarios in which they misjudged the data, and were wrong about what was about to happen. It was in these descriptions of difficult choices and missed opportunities that the earthquake scientists often drew on analogies from baseball to make themselves understood.

When they described predicting the Tōkai Earthquake as if it were a baseball game, the scientists were always the team at bat. Their role was to defend the strike zone (the Tōkai district) against a formidable opposing pitcher (seismicity in general, or perhaps the Tōkai Earthquake itself; audiences could decide for themselves). Each pitch in this imagined encounter was then analogous to reports of unusual changes in one or more of the indicators used to flag potential precursory phenomena in at-risk areas. And, just as batters facing a skillful pitcher in a real game of baseball would have to make quick decisions—to swing or not, where to put the bat—based on their own experience and expertise, earthquake scientists suggested to the public that they too would have very little time to decide what to make of the information coming to them from instruments and observers in the field, and how they ought to react. A “swing” in that context would mean that what was happening at the surface or deep beneath it looked enough like a precursory phenomenon to a major earthquake that experts would agree to issue a warning. Trains would stop, factories would close and normal

routines of all kinds would be thoroughly disrupted as the provisions of the LECA began to take effect.

One of the points that the members of the Hanteikai were trying to get across when they deployed this analogy was something along these lines: until they got better at telling the difference between reports of anomalies that could be safely ignored and those that could not, they would probably swing at every promising "pitch" that came their way. If their reading of an anomalous signal as a precursor to an earthquake turned out to be correct—if the batter got a hit, to stretch the analogy a little further still—then of course the bad news was that a long expected major disaster was about to begin. The good news, one could argue, was that a warning would have gone out ahead of time, and at least some harm avoided as a result.[7] What was more likely to happen if scientists did not exercise restraint in response to all or even most reports of anomalous developments in the Tokai area was that there would be many more earthquake warnings than there would be actual earthquakes. In a different jargon, a warning that wasn't followed by a disaster might be referred to as a false alarm, or as a false positive, but the phrase they borrowed from baseball to describe this phenomenon was 空振り (*kara buri*) "a swing and a miss."

A "swing and a miss" was normally a poor outcome from the batter's perspective—a strike—and proof that his expertise was no match for the pitcher's ability to confound his judgment. In the context of trying to predict the Tokai Earthquake, however, scientists needed the public to understand that "swinging and missing" was better than some of the other forms that failure might take. A decision not to raise the alarm when confronted with activity that might or might not be indicative of an imminent disaster, they said, would be like watching a pitch go by without swinging at it and hoping it didn't end up in the strike zone. The baseball shorthand for that choice was 見送る (*mi-okuru*); taking a called third strike was "見送りの三振" (*mi-okuri no sanshin*). As tempting as it might be to take a wait-and-see attitude and avoid all the disruption that an earthquake warning would provoke, future-Hanteikai members assured the public and policy makers that they would never

[7] Officials in Shizuoka Prefecture argued that whether or not the Tōkai Earthquake was successfully predicted and the provisions of the Act put into effect would have a major effect on how much damage it would do. In late 1978 they estimated that an unpredicted M8 earthquake would result in 10,927 fatalities, before secondary hazards were taken into account. The same earthquake preceded by a warning, on the other hand, would result in injuries but no fatalities (see *Asahi shinbun*, 1).

knowingly choose 見送り as a strategy for themselves. To do so would be to expose the nation to harm in ways that none of the other choices available to them did.

The use of baseball as an analogy for the process of earthquake prediction engages with uncertainty in interesting ways. Instead of comparisons to warfare, or even to weather forecasting, these experts encouraged their audiences to use baseball as a framework for thinking about what was predictable and what was not. One could argue that the scientists who borrowed terms like 空振り and 見送り to explain how prediction would work in practice were also drawing on baseball's familiarity and regular patterns of play to reassure a skittish public that it was in capable hands, and that the Tōkai Earthquake was unlikely to catch them by surprise. As difficult as it might be to hit a professional pitcher's best pitch, everyone knew that it wasn't impossible, and in fact happened all the time. Asking policy makers and others to imagine scientists as batters in their own version of a baseball game was also to suggest that earthquake prediction might be exceptionally difficult (and not for amateurs), but not impossible.

Illustration

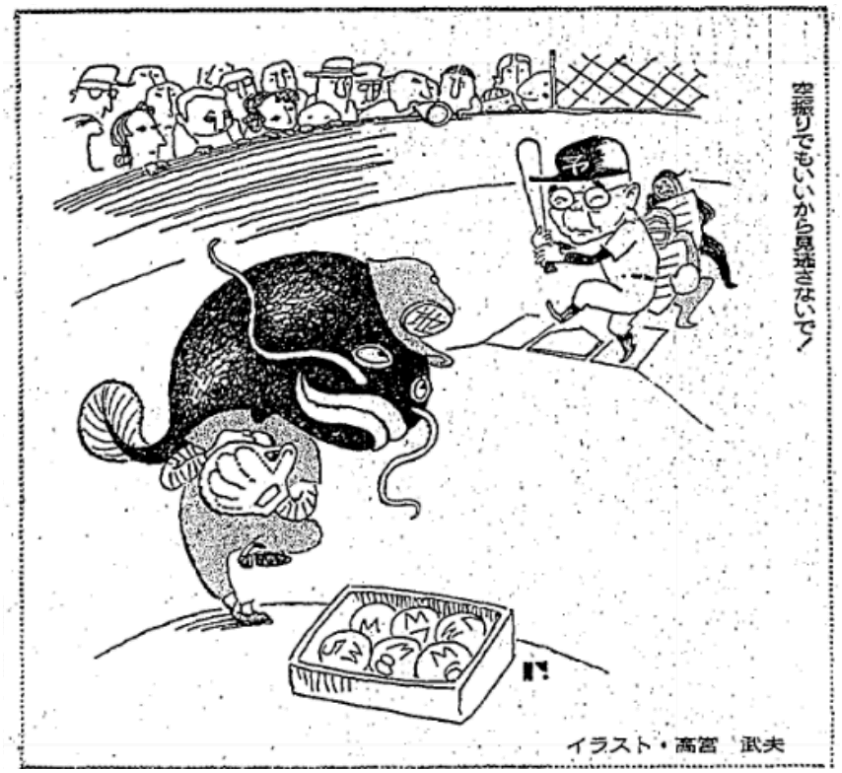

Fig. 6: *Yomiuri shinbun*, August 27, 1979: 25.

"Karaburi de mo ii kara, minogasanai de!"

"A swing and a miss is fine. Don't just watch it go by!"

Here "見逃す" (*minogasu*) replaces "見送る" but the meanings are the same. The batter is likely meant to be Hagiwara Takahiro. The "予" character on his hat references his role as chairman of the Jishin yochi renrakukaigi; it could also be a not too subtle nod to the Yomiuri Giants, Hagiwara's favorite baseball team.) The pitcher is a *namazu*, the catfish often associated with seismicity in Japanese popular culture.[8] The box at the pitcher's feet contains baseballs labeled M5, M6, M7, and M8, representing the range of earthquake magnitudes of interest to the scientists and the nation.

[8] For an analysis of nineteenth-century renderings of the catfish and their association with earthquakes, see Smits, "Shaking Up Japan."

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> 空振りの問題、これはどうしても空振りということはある。余り空振りを恐れますと、今度は見送りで三振になってしまいますので、これはやはりどうしても国民全体の理解ということが必要だろうと思っております。
>
> As for the “swing and miss” problem, there will inevitably be cases like this. If you worry about them too much, and let one get by it will end up being a called third strike. It is essential that everyone understand that this is the case.

Hagiwara Takahiro, Lower House, Saigai taisaku tokubetsu iinkai, February 16, 1978.)

> 空振りということは実は事態が緊迫していることのもう一つの証拠でありまして、空振りを何回か重ねて本番になるのだと思います。ですから、空振りを恐れて今度本当の本番を逃がすようなことになるとすると、これは望ましくない。そういうわけで、地震予知はできるに決まっているんだというような立場ではないのでありまして、あらゆる可能なものをやって、少なくとも東海地震については、何時間か何日か前に前兆をつかまえるように努力をぜひしよう、もしそういう変化ができたらすぐ相談できるように判定会みたいなものも必要である、こういうふうに考えたのがいままでの考え方でございます。
>
> A “swing and a miss” is really another form of evidence that the situation is growing more pressing. After some number of “misses” the actual event [an earthquake] will happen. Thus, what we don’t want to happen is for us to be afraid of a “swing and miss” and as a result miss the real thing. My position here is not that the ability to perform earthquake prediction is a certainty, but rather that everything that can be done will be done, and at least where the Tōkai Earthquake is concerned, we will certainly try very hard to catch precursory signs a few hours or a few days ahead of time. If such changes were to happen, then we would also require some sort of “deciding committee” (*hanteikai)* so that we could begin discussions right away. That is what I have been thinking, and has been my approach all along.

Asada Toshi, Lower House, Saigai taisaku tokubetsu iinkai, March 22, 1978.

> この確度の点でございますが、確かに御指摘のとおり、一発必中の地震予知というのは東海地区におきます大規模地震といえども現段階ではお約束できないと存じます。しかし地域住民の皆様方の三回か四回空振りしてもいいから予知をひとつやれよという御要請がありますので、それ

にこたえてと言っては大変失礼でございますが、何とかいまの技術でこれにおこたえしたいというわけでございまして、今後の強化研究の促進等が進みますれば、この三回か四回の空振りが二回に減り一回に減る、最終的には一発必中の地震予知情報が差し上げられるというところになると思いますので、現時点では二、三回あるいは三、四回の空振りを覚悟でやらしていただく、こういうことでございます。

As you've pointed out, even with regard to a very large-scale earthquake in the Tokai district, we can't promise that a first attempt at prediction will be successful. That said, because all the people living in the region have told us that they're fine with three or four "swings and misses" and to go ahead with making a prediction…we're doing what we can with our current capabilities to respond accordingly. Looking ahead, as improvements are made in research in support of this effort, over time the number of "swings and misses" will decrease from three or four to two, and then to just one, until finally it will be possible to produce earthquake prediction information that is successful on the first try. And, while it may be quite impolite to respond to their appeals in this way, for now we must be resigned to the two, or three, or four "swings and misses."

Suehiro Shigeshi (Japan Meteorological Agency), Lower House, Saigai taisaku tokubetsu iinkai, April 18, 1978.

技術的見地からお答えするわけでございますけれども、見逃しをしてはいかぬということが一番大事なことでございますので、見逃しをしないためには、最少ある程度の空振りも許していただくというところでやらしていただくわけでございまして、法案の中にも、警戒宣言の解除ということが明記されておりますけれども、私どもといたしましては、今後御理解をいただきまして、観測強化等によりましてなるべく空振りの回数を少なくして、しかも見逃しをしない一発必中のところへ技術を持っていきたいと、努力するつもりでございます。

From a practical/technical standpoint, the most important thing of all is not to let one get by us. In order to make sure that doesn't happen, we humbly ask that we be allowed the bare minimum number of "swings and misses." The draft legislation [of the Large Scale Earthquake Countermeasures Act] includes provisions for withdrawing an emergency announcement, and we ask for your understanding going forward. As our monitoring capabilities improve, the number of "swings and misses" will be reduced as much as possible, with the goal of developing our capabilities to the point of being able to hit the ball with unerringly, and not letting one get by.

Suehiro Shigeshi (Japan Meteorological Agency), Upper House, Saigai taisaku tokubetsu iinkai, May 12, 1978.

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