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The “Science” of the Ancestors: Divination, Curing, and Bronze-Casting in Late Shang China

A report card on early Chinese science, technology, and medicine might well include the comment, “Tries hard at predictive science, superb technology, excellent bedside manner.” I hope, in the essay that follows, to demonstrate how the theological assumptions of Shang divination, operating within a context of ancestor worship and dealing with such matters as illness (early medicine) and the weather (early weather prediction), intersected with, and served to reinforce many of the cultural traits that also made the technology of Late Shang bronze-casting so remarkably successful. The legacy of these achievements can be understood as having shaped subsequent Eastern Zhou solutions to scientific and technological questions.

Let me deal at the start with some matters of definition. As Nathan Sivin has reminded us,

It is almost impossible to think about traditional Chinese science and technology without comparing them, explicitly or implicitly, with their present-day analogues. Otherwise it would be difficult even to identify what past activities are of technical interest. Nevertheless, the transforming influence of the scientific and industrial revolutions was so great that the earlier sciences of China and Europe resemble each other more than either resembles the modern variety. It is important, if one is to think clearly about science and technology as worldwide phenomena, to avoid confusing differences between China and the West with differences between traditional societies and societies that have become essentially modern.¹

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¹ Nathan Sivin, “Science and Medicine in Chinese History,” in Paul S. Ropp, ed., *Heritage of China: Contemporary Perspectives on Chinese Civilization* (Berkeley: U. of California P., 1990), p. 167.

Sivin has also made the point that

A historian's working definition of science might look for systematic, coherent discourse about natural phenomena that strives toward an ideal of abstraction and objectivity. These characteristics mark the sciences off from the endless concreteness of poetic metaphor, as well as from religious frames of meaning built on will, love, and mystical insight. At the same time such a definition does not assume an impenetrable border, for the ancient sciences were not airtight. The ideal could never be realized (nor is objectivity more than an ideal in science today). Still it formed the discourse, giving it consequences that were not literary or religious. Such a definition may be irritatingly soft, but it sums up what is common to all research in the history of science.²

I shall, in this essay, be using such an "irritatingly soft" definition of science, and I follow Sivin in my understanding that science in the ancient world involved "systematic, coherent discourse about natural phenomena that strives toward an ideal of abstraction and objectivity." Donald Harper, who has also noted that the use of the word "science" for early cultures is problematic, prefers "natural philosophy, in the sense of systems of thought that take nature as their primary object of investigation and that develop theories to explain phenomena in terms of perceived regularities in the operation of nature itself."³ It is considerations such as these that lead me to put the "Science" of my title inside quotation marks. I do not mean by this that I am not discussing a certain kind of science; but I do mean to indicate that I am not discussing "modern, western" science. I treat the Shang system of prediction and curing as scientific because of the elaborate, consistent, and impersonalized theological structures, ritual practices, and cosmological assumptions that the Shang elites developed to give them cultural advantage and assurance when confronted with the world in general and with illness, weather, and bronze-casting in particular. Divination, as both science and technology, permitted the Shang, who paid much attention to the role of numeration, quantification, and timing,

² Nathan Sivin, "Science and Medicine in Imperial China: The State of the Field," *Journal of Asian Studies* 47.1 (1988), p. 43. See too the discussion of G. E. R. Lloyd, *The Ambitions of Curiosity: Understanding the World in Ancient Greece and China* (New York: Cambridge U.P., 2002), pp. 1, 21, who notes that the target of such discussions should be "systematic enquiry" and that "'Science,' in particular, is open to criticism both on the grounds of anachronism and on those of teleology."

³ Donald Harper, "Warring States Natural Philosophy and Occult Thought," in Michael Loewe and Edward L. Shaughnessy, eds., *The Cambridge History of Ancient China: From the Origins of Civilization to 221 B.C.* (Cambridge: Cambridge U.P., 1999), p. 815. See too the quotation from Paula Findlen, below.

to test and implement the hypotheses they had formulated to explain their world.⁴

In addressing the “fit” between Shang science and Shang culture, by which I mean the elite culture of Late Shang China (ca. 1200–1045 BC), I shall be dealing primarily with Shang science as we see it recorded in the divination inscriptions and in the material culture that archaeologists have retrieved. Other forms of curing presumably existed, but they have left no documentary trace. I treat the Late Shang elites as an “epistemic community,” which provided moral and cognitive standards that were deeply implicated in the distribution of power on the North China plain at the end of the second millennium.⁵ In early China, as in other early cultures, science and religion, were inextricably entwined.

Our source for Late Shang science is primarily the oracle-bone inscriptions that were placed in underground caches between about 1200 and 1045 BC and that only started to be rediscovered in about 1899 AD, a little over a century ago. These divinatory inscriptions recorded the wishes, rituals, forecasts, and administrative choices of the Late Shang kings.⁶ The rituals were generally directed to the royal ancestors who were expected to confer blessings on their descendants in return for their ritual offerings. It seems likely, indeed, that the ancestors were thought to produce the pyromantic cracks in the bones and shells; and

⁴ Shang science must, of course, be understood in terms of “its presumed capacity for verification across the lines of all the world’s cultures”; it must be approached, instead, in terms of “the authority of the distinctive social entities that Thomas S. Kuhn and his followers have helped us to recognize: sharply bounded professional communities characterized by rigorous procedures for the acculturation of their members”; David Hollinger, “How Wide the Circle of the ‘We’?: American Intellectuals and the Problem of the Ethnos since World War II,” *American Historical Review* 98.2 (1993), p. 319.

⁵ For the epistemic community, see Hollinger, “How Wide,” pp. 323, 329. For an account of the Late Shang community and its ecological and cultural environment, see David N. Keightley, *The Ancestral Landscape: Time, Space, and Community in Late Shang China (ca. 1200–1045 B.C.)* (Berkeley: Institute of East Asian Studies, 2000).

⁶ For an introduction to these documents and how they worked, see a number of works by David N. Keightley: *Sources of Shang History: The Oracle-Bone Inscriptions of Bronze Age China* (Berkeley: U. of California P., 1978; 2d printing, with minor revisions, 1985); “The Religious Commitment: Shang Theology and the Genesis of Chinese Political Culture,” *History of Religions* 17 (1978), pp. 211–24; “Late Shang Divination: The Magico-Religious Legacy,” in Henry Rosemont, Jr., ed., “Explorations in Early Chinese Cosmology,” *Journal of the American Academy of Religion Studies* 50.2 (1984), pp. 11–34; “Shang Divination and Metaphysics,” *Philosophy East and West* 38 (1988), pp. 367–97; “Shang Oracle-Bone Inscriptions,” in Edward L. Shaughnessy, ed., *New Sources of Early Chinese History: An Introduction to the Reading of Inscriptions and Manuscripts*, Early China Special Monograph Series 3 (Berkeley: The Society for the Study of Early China and The Institute of East Asian Studies, University of California, Berkeley, 1997), pp. 15–56; “Theology and the Writing of History: Truth and the Ancestors in the Wu Ding Divination Records,” *Journal of East Asian Archaeology* 1.1 (1999), pp. 203–26.

it was those cracks that enabled the Shang king, the royal diviner, to diagnose the present and predict the future.⁷

THE PREDICTIVE SCIENCES

Just as the ancient Mesopotamian practice of “deductive divination” may be seen as laying the foundations for scientific thinking about the world,⁸ so Shang divination may be seen as having played a similar role. Much Shang divination was concerned with forecasting the future, or with understanding the present with a view to shaping the future successfully. It seems likely, however, that the king’s production of “lucky” cracks was also thought to play a magical role, so that the royal diviner did not simply forecast the future, he also helped to induce it.⁹ Many of the divination charges, accordingly, can be understood not simply as forecasts but as wishes, virtual incantations. Consider, for example,

INSCRIPTION 1

癸巳王卜貞：旬亡禍。王固曰吉。在八月。甲午翌上甲

(Preface:) On *guisi* (day 30), His Majesty made cracks and divined:

(Charge:) “In the (next) ten days there will be no disasters.”¹⁰

(Prognostication:) His Majesty read the cracks and said: “Auspicious.” (Postface:) In the eighth moon. (For the week in which on)

jiawu (day 31) (we were to perform) the *yi*-ritual to Shang Jia (the predynastic founder of the Shang lineage).¹¹

This routine Period V Charge, “旬亡禍: In the (next) ten days there will be no disasters,” was divined on the last, *gui*-day of every ten-day week (as in inscriptions 2 and 4),¹² probably for at least the century and a

⁷ David N. Keightley, “Divination and Kingship in Late Shang China” (1991, book ms.), pp. 104–39.

⁸ Jean Bottéro, *Mesopotamia: Writing, Reasoning and the Gods* (Chicago: U. of Chicago P., 1992), pp. 125, 130–31, 136), argues for the empirical, systematic, and hence “scientific” nature of deductive divination in Mesopotamia, to which he provides a useful introduction. His arguments and conclusions, however, now need to be considered in light of the qualifications proposed by Francesca Rochberg, “Empiricism in Babylonian Omen Texts and the Classification of Mesopotamian Divination as Science,” *JAOs* 119.4 (1999), pp. 559–69.

⁹ Keightley, *Sources*, p. 213, and n. 7; cf. Sarah Allan, *The Shape of the Turtle: Myth, Art, and Cosmos in Early China* (Albany: State University of New York P., 1991), p. 113.

¹⁰ I understand the common incantation “亡禍” to have meant, “there will be no omens (in the cracks)” and thus, by extension, “there will be nothing ominous (in the world, both symbolic and material, at large),” and thus “there will be no disasters.” The impact of many of the divinations, accordingly was not to discover if something was in itself “a disaster” but whether it had ominous, hence disastrous, implications. See too the discussion of *jiu* 咎, “calamities,” at n. 14, below.

¹¹ Guo Moruo 郭沫若, ed., Hu Houxuan 胡厚宣, ed.-in-chief, *Jiaguwen heji* 甲骨文合集 (n.p.: Zhonghua shuju, 1978–82; hereafter cited as *Heji*), no. 35398.

¹² See, too, n. 19.

half of the Shang historical period. It seems likely that this particular divinatory ritual was partly designed to demonstrate that, when the king wished for and foresaw, for the next ten-day week, good fortune in the cracks (as he did in the prognostication above), he had played a role in bringing that good fortune to pass. And it should also be noted, as the Postface reveals, that time in such predictive contexts was ancestral time; the Period V diviners used the cycle of ancestral rituals to provide chronological markers.

Such incantations, in fact, had become entirely routine by the reign of the last two kings, Di Yi 帝乙 and Di Xin 帝辛 (ca. 1100–1045 BC); they had become so routine, in fact, that, by that time, the diviners rarely bothered to provide verifications that recorded the success or failure of the diviner’s prognostication of good fortune.¹³ Under Wu Ding 武丁 (?–1189 BC), by contrast, the Shang had attached great importance to correlating prediction and result, but in the reign of this particular king the predictions were often ominous, as in:

INSCRIPTION 2

癸巳卜般貞：旬亡禍。王固曰：咎其出來嬉。乞至五日丁酉允出來嬉自西沚。馘告曰土方正于我東鄙。二邑百方亦侵我西鄙田。

Making-cracks on *guisi* (day 30), Que divined: “In the (next) ten days there will be no disasters.” His Majesty read the cracks and said: “There will be calamities;¹⁴ there may be (someone) bringing alarming news.” (Verification:) When it came to the fifth day, *ding-you* (day 34), there really was (someone) bringing alarming news from the west. Zhi Guo (a Shang general) reported and said: “The

¹³ It was only in the Period V hunt divinations (see item 21, for a Period I instance), with their routinely “auspicious” prognostications of good fortune (see Yao Xiaosui 姚孝遂 and Xiao Ding 肖丁, eds., *Yinxu jiagu keci leizuan* 殷墟甲骨刻辭類纂 [Beijing: Zhonghua, 1989; hereafter, Y] 807.1–809.4), that the diviners recorded with some frequency, the numbers of game actually caught: e.g., *Heji* 37362, 獲虎一狐六 (“[We] caught tigers, one, and foxes, six”) and *Heji* 37364, 獲象十雉十又一 (“[We] caught elephants, ten, and pheasants, eleven”); for other examples see *Heji* 37363, 37366–75, etc. Few non-hunt inscriptions from Period V recorded any verifications at all.

¹⁴ I follow Qiu Xigui 裘錫圭, “Shi ‘qiu’ 釋求, *Guwenzi yanjiu* 古文字研 15 (1986), p. 204, in reading oracle-bone 𠄎 (Y572.2), in the appropriate contexts, as *jiu* 咎 (“calamities” or “cause calamities”). The distinction between the various Shang “disaster” words is not easy to determine (see, e.g. Stanley Mickel, “A Semantic Analysis of the Disaster Graphs of Period One Shang Dynasty Oracle Bones” [Ph.D. diss., Indiana University, 1976], for a pioneering introduction to the evidence). Precisely how *jiu* differed in meaning from *huo* 禍 (see n. 10, above), for example, is not clear. That *jiu* and *hai* 害 (“harm”; see n. 36, below) were related yet distinct is revealed by the prognostication on *Heji* 2960f: 亡害咎, “There will be no harm (but) there will be calamities”; this suggests that “harm” (*hai*) may have been more feared than “calamities” (*jiu*). This may have been because *jiu* was merely a sign of general, even accidental, misfortune, whereas *hai* was a sign of a focused and intended harm, generated by some Power, frequently ancestral.

Tufang (an enemy group) have attacked in our eastern borders and have seized two settlements. The Gongfang (another enemy group) likewise invaded the fields of our western borders.”¹⁵

In such cases (see too inscription 3), the king, despite the wished-for outcome that he had proposed (“there will be no disasters”), forecast calamities, and sure enough, the calamities arrived, thus confirming his powers of prediction and legitimating his role as the leader – the sole leader, “I the one man 余一人”¹⁶ – who could divine the intent of the Powers.¹⁷ The Shang kings, like their successors in imperial times, appreciated the importance of controlling and monopolizing the mantic arts. That, during the reign of Wu Ding, such validating inscriptions were frequently written in large, bold calligraphy, with the graphs (and cracks) filled with colored pigment, suggests that they may have been intended for an audience; I have referred to them, accordingly, as “display inscriptions.”¹⁸ Successful predictions, in short, conferred political and religious legitimacy upon the Shang king, even when his forecasts had not, as in this case, been favorable. Whatever “science” may have been involved, it was at the service of the dynast. And it would, to that extent, not have entirely satisfied the criterion of “objectivity” introduced at the start of this essay.

WEATHER

Wu Ding’s concern with correlating prediction and result may also be seen in his divinations about the weather. Two examples will illustrate how this worked.

INSCRIPTION 3

王曰出咎八日庚戌出各雲自東函母昃亦出虹自北飲于河

His Majesty read the cracks and said: “There will be calamities.” (Verification:) On the eighth day (inclusive count, following Shang practice), *gengxu* (day 47),¹⁹ there were great clouds from the east; they covered (the sky from top to bottom) and it was dark;²⁰ in the

¹⁵ *Heji* 6057f.

¹⁶ On this term, see Hu Houxuan 胡厚宣, “Chonglun ‘Yu yi ren’ wenti” 重論“余一人”問題, *Guwenzi yanjiu* 6 (1981).

¹⁷ For my use of the term “Powers” to refer to the larger animistic forces that the Shang believed dominated their world, see Keightley, *Ancestral Landscape*, pp. 5 (n. 16), 7.

¹⁸ Keightley, *Sources*, p. 46, n. 90.

¹⁹ This prognostication and verification were a response to a charge, presumably recorded on a missing portion of this scapula, that must have read: “Cracking making on *guimao* (day 40), Que X divined: ‘In the (next) ten days, there will be no disasters.’”

²⁰ For this translation of the last sentence, see Sun Changxu 孫常敘, “Shi mao hui, jian shi

afternoon there was also ... the coming out of a rainbow-dragon from the north, which drank in the He (Yellow River).²¹

Once again, the king had forecast calamities. And the verification had provided a detailed account of the clouds, the direction from which they came, and the time of day, afternoon, when the rainbow, considered ominous, appeared.²² A similarly detailed verification appears on a plastron fragment, again from the reign of Wu Ding:

INSCRIPTION 4

癸亥卜貞：旬。一月。昃雨自東九日辛未大采各雲自北雷延大風自西荆雲率雨毋^𠄎日^𠄎

Making cracks on *guihai* (day 60), divined: “In the (next) ten days (there will be no disasters).”²³ First moon. (Verification:) In the afternoon (of *guihai*, the day of divination) it rained from the East. On the ninth day, *xinwei* (day 8), at *dacai* (ca. 8 a.m.)²⁴ there were large clouds from the North, thunder was prolonged, there was a great wind from the West. It dispersed the two clouds, led off (?) the rain, and the sun really [cleared?].²⁵

In this and similar cases (including five or six other “ten-day” divination records on the same plastron as inscription 4), the engravers did not record the king’s forecast (which would have been of the form you *jiu* 且咎; see inscription 3), but it was presumably confirmed by the weather patterns of the next ten days, which, because the divination had rendered them portentous, the record-keepers noted in considerable detail. Prediction required subsequent observation. And the king evidently found it useful, at least on occasion, to have the events that followed his divination recorded in this detailed way.

ge yun, ban Z” 釋函^𠄎兼釋各云般函, *Guwenzi yanjiu* 15 (1986), pp. 242–50.

²¹ *Heji* 10405b. On the meteorological accuracy of this record, see Keightley, *Ancestral Landscape*, p. 91, n. 40.

²² On the ominous nature of the rainbow in early China, see Keightley, “The Origins of Writing in China: Scripts and Cultural Contexts,” in Wayne M. Senner, ed., *The Origins of Writing* (U. of Nebraska P., 1989), pp. 184, 199, n. 8. The rainbow was depicted in the form of a two-headed serpent that was able to drink up water with both mouths; it evidently symbolized the forces of drought.

²³ The “*xun wang huo*” formula was so standard that the record-keepers, on occasion, as they did here, abbreviated it to *xun*.

²⁴ On Shang time-phrases, see n. 92, below.

²⁵ *Heji* 21021. I supply the “cleared” on the basis of the *guihai* charge and verification recorded in Guo Ruoyu 郭若愚, Zeng Yigong 曾毅公, Li Xueqin 李學勤, *Yinxu wenzi zhuihe* 殷虛文字綴合 (Beijing: Kexue, 1955; hereafter, *Zhuihe*) 78 (also, Shima Kunio 島邦男, *Inkyo bokuji sōru* 殷墟卜辭綜類, 2d rev. edn. [Tokyo: Kyūko, 1971; hereafter, S] 171.3), which the *Heji* editors have omitted from their reproduction. I am uncertain how to translate the last four graphs; for an alternative rendering, see Keightley, *Ancestral Landscape*, p. 92.

MEDICINE

Just as I have referred to “the science of the ancestors” in the title of this essay, so would I refer to the medicine of the ancestors.²⁶ Arthur Kleinman, among others,²⁷ has made a distinction that bears on the concerns of this essay: “Disease refers to a malfunctioning of biological and/or psychological processes, while the term illness refers to the psychosocial experience and meaning of perceived disease.” Any disease, he proposed,

... smallpox, leprosy, syphilis, hypertension, cardiovascular disorders, cancer, etc. – is in part a cultural construct. Disease derives much of its form, the way it is expressed, the value it is given, the meaning it possesses, and the therapy appropriate to it in large measure from the governing system of symbolic meaning.²⁸

I deal in this essay with what has been called “the sociology of illness.”²⁹ Being sick in Shang China – with its paradigms and metaphors – would have been quite different from being sick in early Mesopotamia, say, or early Greece. Different cultures undoubtedly get the kinds of disease they deserve, the kinds of disease and medical expectations with which they are least uncomfortable.

The oracle-bone inscriptions provide virtually no certain information about what has been termed “medical prophylaxis” – which might have involved cauterization, massage, acupuncture, inhalations, and so on – in Shang.³⁰ The archaeological evidence of medical prac-

²⁶ For early studies of Shang medicine, see, e.g., Yan Yiping 嚴一萍, *Yinqi zhengyi* 殷契徵醫 (Taipei, 1951); and Hu Houxuan, “Yinren jibing kao” 殷人疾病考, in Hu Houxuan, *Jiagu-xue Shangshi luncong chujī* 甲骨學商史論叢初集 (Chengdu: Qi Lu daxue Guoxue yanjiusuo, 1944), vol. 2 (rpt. Taipei: Wenyoutang shudian, 1981). Li Zongkun 李宗焜, “Cong jiaguwen kan Shangdai de jibing yu yiliao” 從甲骨文看商代的疾病與醫療, *Zhongyang yanjiuyuan Lishi yuyan yanjiusuo jikan* 中央研究院歷史語言研究所集刊 72.2 (2001), provides an instructive critical review of the scholarship.

²⁷ Arthur M. Kleinman, *Patients and Healers in the Context of Culture: An Exploration of the Borderland Between Anthropology, Medicine, and Psychiatry* (Berkeley: U. of California P., 1980), p. 72, and Paul U. Unschuld, *Medicine in China: A History of Ideas* (Berkeley: U. of California P., 1985), p. 19.

²⁸ Arthur M. Kleinman, “Medicine’s Symbolic Reality: On a Central Problem in the Philosophy of Medicine,” *Inquiry* 16 (1973), p. 209, as cited by Margaret M. Lock, *East Asian Medicine in Urban Japan: Varieties of Medical Experience* (Berkeley: U. of California P., 1980), p. 12.

²⁹ Renée C. Fox, “Illness,” in David L. Sills, ed., *International Encyclopedia of the Social Sciences* (New York: Macmillan and The Free Press, 1968), p. 90.

³⁰ See, e.g., Hu Houxuan’s attempt (“Lun Yinren zhiliao jibing zhi fangfa” 論殷人治療疾病之方法, *Zhongyuan wenwu* 中原文物 [1984.4], pp. 27–30) to read the oracle-bone graph (found in *Heji* 3674) of a figure sleeping on a bed with a wooden brand by the belly as evidence of Shang moxibustion, or the graph showing a hand over a figure on a bed (*Heji* 13712f, 13864) as evidence of Shang massage. Li Zongkun, “Cong jiaguwen,” pp. 377–79, is properly cautious about these conclusions, which rely primarily upon graph form; he also cites the objections of other scholars. See too the cautious comment of Harper, “Natural Philosophy and Oc-

tice is also not easy to interpret. Dai Yingxin, for example, raises the possibility that certain Liangzhu 良渚 jade awls had been used to draw off blood or pus in the Neolithic, but this is far from certain.³¹ Han Kangxin and Chen Xingcan provide evidence for skull trepanation in early China, citing as one example the skull (M9:7) of an accompanier-in-death, an adult male buried at Hougang 後岡, ca. 2000+ BC. They note that the perforation – a roundish hole, ca. 7–8 mm inner diameter, ca. 18.5–19.5 mm outer diameter – had clearly been made while the subject was alive, and that there are no traces of any other trauma elsewhere on the skull.³² One can only speculate, however, about what the purpose of such an operation might have been.

By contrast, we know much about “ceremonial prophylaxis.”³³ By the end of the first millennium BC. when Shang elites were falling sick, diagnosis and treatment were intimately related to ancestral malevolence and ancestral sacrifice. The divination inscriptions of Shang reveal that king Wu Ding suffered from sick teeth, feet, eyes, and ears.³⁴ His illnesses and their spiritual significance were a matter of considerable concern; diagnosis involved a determination of the ancestral etiology, to discover which ancestor had caused the illness. Many other early civilizations have taken a similar approach to illness.

The vast majority of Mesopotamian texts which are concerned with the spirits of the dead consists of ritual texts giving instructions for the “dismissal” of illnesses. Recognizing who was responsible for the illness was the key to being cured.³⁵

cult Thought,” p. 94, n. 1, on Dean C. Epler, “Blood-letting in Early Chinese Medicine and its Relation to the Origin of Acupuncture,” *Bulletin of the History of Medicine* 54 (1980), pp. 337–67, who cites the conjecture of Miyashita Saburō 宮下三郎, “Chūgoku kodai no shippei kan to ryōhō” 中國古代的疾病觀と療法, *THGH* 30 (1959), pp. 227–52, about bloodletting in the oracle-bone inscriptions.

³¹ Dai Yingxin 戴應新 “Wo guo xinshiqi shidai yiyao weisheng zhuangkuang tanxi” 我國新石器時代醫藥衛生狀況探析, in Shi Xingbang 石興邦 and Zhang Ruiling 張瑞齡, eds., *Shiqian yanjiu jikan: Shaanxi sheng kaogu yanjiusuo, Xi'an Banpo bowuguan chengli sanshi zhounian jinian tekan* 史前研究輯刊, 陝西省考古研究所, 西安半坡博物館成立三十周年紀念特刊 (1988), p. 268 (citing *WW* [1988.1], pp. 24, fig. 47; 25, fig. 53).

³² Han Kangxin 韓康信 and Chen Xingcan 陳星燦, “Kaogu faxian de Zhongguo gudai kailushu zhengju” 考古發現的中國古代開顱術證據, *KG* (1999.7), p. 65, pl. 5.3.

³³ I take the two terms, “medical prophylaxis” and “ceremonial prophylaxis,” as well as the list of possible medical procedures, from Douglas Miles, who notes that, among the Yao of northern Thailand (in 1966–68), “who are Sinitic in origin and cultural orientations ... Every variant of ceremonial prophylaxis is an ancestral-cult ritual”; Miles, “Prophylactic Medicine and Kin Units Among Yao Ancestor Worshipers,” in William H. Newell, ed., *Ancestors* (The Hague: Mouton, 1976), pp. 310–11.

³⁴ Y1171.2.

³⁵ Gerdien Jonker, *The Topography of Remembrance: The Dead, Tradition and Collective Memory in Mesopotamia* (Leiden: Brill, 1995), p. 203.

In the Shang case, it was first necessary to determine if the ancestors were implicated at all, as in :

INSCRIPTION 5A

疾齒佳卬害

“The sick tooth is due to (ancestral) harm.”³⁶

INSCRIPTION 5B

疾齒不佳卬害

“The sick tooth is not due to (ancestral) harm.”³⁷

INSCRIPTION 6

貞：婦好卬疾佳卬害

Divined: “Lady Hao being sick is due to (ancestral) harm.”³⁸

And once ancestral involvement had been established, Wu Ding’s diviners then turned to identifying the ancestor responsible, as in:

INSCRIPTION 7

貞：疾齒不佳父乙害

Divined: “As to the sick tooth, it is not due to Father Yi (= Xiao Yi 小乙; K₂₀),³⁹ Wu Ding’s father) harming (it/him).”⁴⁰

Once the divination had determined the etiology of the illness, the appropriate ritual remedy could be addressed to the ancestor involved. For example, a scenario recorded on the front and back of a set of five turtle plastrons reveals that, some ten days after the king had contem-

³⁶ Qiu Xigui, “Shi hai” 釋蚩, *Guwenzixue lunji* 古文字學論集 (H.K.: Chinese U. of Hong Kong, 1983), pp. 219–22, demonstrates convincingly that oracle-bone 蚩 (or 害) was an early form of *hai* 害 (see the other explanations proposed at Matsumaru Michio 宋凡道雄 and Takashima Kenichi 高嶋謙一, *Kōkotsumoji jishaku sōran* 甲骨文字字釋綜覽 [Tokyo: Tokyo U.P., 1993 (not for sale); 1994; hereafter, *Sōran*] 1576); it depicted a foot being bitten by a serpent and had the sense of “harm,” being used as both a verb and a noun. The source of the harm varied with context; e.g., Di 帝, the High God, might harm the harvest (as in *Heji* 10124f); He 河, the River Power, might harm the king (as in *Heji* 776f); Yang 羊, the Mountain Power, might harm the rain; e.g., Zhongguo shehui kexueyuan kaogu yanjiusuo 中國社會科學院考古研究所, *Xiaotun nandi jiagu* 小屯南地甲骨 (Shanghai: Zhonghua, 1980, 1983; hereafter, *Tun-nan*) 644, 2438; and Li Xueqin 李學勤, Qi Wenxin 齊文心, Ai Lan 艾蘭 (Sarah Allan), *Yingguo suocang jiagu ji* 英國所藏甲骨集, *Oracle Bone Collections in Great Britain* (Zhongguo shehui kexueyuan lishi yanjiusuo and School of Oriental and African Studies, University of London; Beijing: Zhonghua, 1985) 2444, at Y467.2. Toothache or other sickness might be one manifestation of such harm, caused by ancestors (as in item 7 and *Heji* 822f); and there was the frequent concern that rituals not be afflicted with harm (see, e.g., the charges about cult at Y685.2–686.1 that end with the incantation, “there will be no harm 亡害.”

³⁷ *Heji* 13647f.

³⁸ *Heji* 13714f.

³⁹ K₂₀ indicates Xiao Yi was the 20th Shang king as recorded in the Period V ritual cycle; for the K numbers used in this article, see David N. Keightley, “At the Beginning: The Status of Women in Neolithic and Shang China,” *Nan nü: Men, Women and Gender in Early and Imperial China* 1 (1999), pp. 58–61; idem, *Ancestral Landscape*, pp. 132–33.

⁴⁰ *Heji* 13646f; Y1177.2.

plated joining his generals, Wang Cheng 望乘 or Zhi Guo 止馘, in an attack on the Xiawei 下危,⁴¹ he was stricken with toothache. This led him to propose the following divination charges:

INSCRIPTION 8A

貞: 𠄎犬于父庚卯羊

Divined: “(We) offer a dog to Father Geng (K18) (and) split open a sheep.”

INSCRIPTION 8B

貞: 祝以之疾齒鼎𧈧 <小告>

“If we pray by means of these (offerings), the sick tooth will certainly be cured.”⁴² <(Crack notation:) “Small report.”>

INSCRIPTION 8C

疾齒𧈧

“The sick tooth will be cured.”

INSCRIPTION 8D

不其𧈧

“(The sick tooth) might not be cured.”⁴³

On the back of the five plastrons in the set, the Shang recorded a series of diagnostic “subcharges”:

INSCRIPTION 8E

佳父甲

“(The toothache) is due to Father Jia (K17).”

INSCRIPTION 8F

不佳父甲

“(The toothache) is not due to Father Jia.”

INSCRIPTION 8G

佳父庚

“(The toothache) is due to Father Geng (K18).”

⁴¹ Zheng Jiexiang 鄭杰祥, *Shangdai dili gailun* 商代地理概論 (Zhengzhou: Zhongzhou guji chubanshe, 1994), pp. 363–64, tentatively locates Xiawei (which he reads as Xiagu 下古) in the region of the present Luyi 鹿邑 *xian* in Henan, ca. 250 k southwest of Anyang.

⁴² I follow David S. Nivison, “Interpretation of an Inscribed Turtle Plastron (*Ping Pian* 182, 183; reign of King Wu Ting of Shang)” (ms., January, 1977), p. 12, who identifies oracle-bone long 龍 “dragon,” often read as chong 寵, “favorable” (e.g., Keightley, *Sources*, p. 80, n. 89; *Sōran* 4842), with *giu* 𧈧, “hornless dragon” (see the discussion at Shima Kunio 島邦男, *In-kyo bokuji kenkyū* 殷墟卜辭研究 (Hirosaki: Hirosaki daigaku Chūgoku kenkyūkai, 1958), pp. 277–78; Paul L-M Serruys, “The Language of the Shang Oracle Inscriptions,” *TP* 60 [1974], pp. 95–96), which he takes to be the “probable original of *chou* 瘳,” “to improve, cure.”

⁴³ *Heji* 6482f-6486f.

INSCRIPTION 8H

不佳父庚

“(The toothache) is not due to Father Geng.”

INSCRIPTION 8I

佳父辛

“(The toothache) is due to Father Xin (K19).”

INSCRIPTION 8J

不佳父辛

“(The toothache) is not due to Father Xin.”

INSCRIPTION 8K

佳父乙

“(The toothache) is due to Father Yi (K20).”

INSCRIPTION 8L

不佳父乙

“(The toothache) is not due to Father Yi.”⁴⁴

Several points may be noted. First, the effort involved in this diagnosis was considerable. The diviner made some seventy pyromantic cracks to discover the ancestor responsible for the toothache (inscriptions 8E-L). When, as seems likely, he had identified Father Geng (i.e., Pan Geng 盤庚, the eighteenth Shang king, and Wu Ding’s uncle) as the source of the dental pain,⁴⁵ he devoted some twenty additional crackings to discovering if sacrifice to Father Geng would obtain results (inscriptions 8A_B).⁴⁶ If the diviners made one crack a minute (and that is probably an overly rapid estimate), it would have taken an hour and a half to perform the ancestor- and sacrifice-divinations in this set; if they made one crack every two minutes, it would have taken three hours, and so on.⁴⁷ Divinatory diagnosis and prescription was evidently a fairly time-consuming process. Today, a patient waits for the doctor, the blood

⁴⁴ *Heji* 6482b-6486b.

⁴⁵ I assume that the auspicious *xiao gao* 小告, “small report,” crack notation by the number “2” crack associated with inscription 8B was paired with inscription 8A, and that a favorable reading extended to both of the charges, indicating that the offering of a prayer and a dog and sheep to Father Geng would be of some efficacy (see below). On the possible meanings of the crack notation, which was auspicious, see David N. Keightley, “Reports from the Shang: A Correction and Some Speculations,” *EC* 9-10 (1983-85), pp. 47-54. For a full analysis of the inscriptions on this plastron set and the cracks associated with the various charges, see Keightley, *Sources*, pp. 76-90.

⁴⁶ For a full analysis of the inscriptions on this plastron set and the cracks associated with the various charges, see Keightley, *Sources*, pp. 76-90.

⁴⁷ This analysis is based on *ibid.*, p. 89.

tests, the X-ray results; in Shang, the patient, generally the king, waited for the diviners, the cracks, and the ancestors.

Second, it may be noted that, at least as recorded in the divination inscriptions, the benefits of such ancestral medicine were limited to a select few. Only Wu Ding,⁴⁸ and his consort, Lady Hao (Fu Hao 婦好),⁴⁹ for example, are specifically recorded as suffering from toothache;⁵⁰ in all other cases, the patient was presumably the king, but his identity was not specified.⁵¹ Third, it may be noted that, in this case, the cracks may not have given the divinatory diagnosis and prescription the strongest endorsement. The crack-notation, *xiao gao*,⁵² was auspicious, but, whatever its precise meaning, it was evidently not as strongly auspicious as the more common notation, *er gao* 二告, “two reports.”⁵³

Finally, one may note the way in which the diagnosis was tied to the genealogical order of the ancestors. The four pairs of positive-negative subcharges that specified Father Jia, Father Geng, Father Xin, and Father Yi as the possible source of the toothache, were divined in the order in which the four kings involved – Sima Qian’s Yang Jia 陽甲 (inscriptions 8EF), Pan Geng 盤庚 (inscriptions 8GH), Xiao Xin 小辛 (inscriptions 8IJ), and Xiao Yi 小乙 (inscriptions 8KL) – had come to the kingship and the order in which the Shang offered them cult. Good medical diagnosis, in short, followed ritual, genealogical order. And finally, as we have seen in the case of the weather reports like those recorded in the verifications of inscriptions 3 and 4, it was evidently important that a permanent record of the entire episode be carved into the bone. Even though Fathers Jia, Xin, and Yi had not been identified as the etiological agent, good divinatory practice, good medical practice, involved keeping a full record of the alternative diagnoses that had been proposed. Presumably, if the proposed cure failed, the ritualists would thus have known what options had already been explored.

I cannot help introducing a personal observation at this point. Over ten years ago, on Friday the thirteenth as it happens, I suffered, much to the surprise of my doctor, a heart attack. Subsequent inquiry revealed that three of my mother’s brothers had died from heart attacks in their fifties. My own illness may have been partly due to a genetic disposition. One could say, as Wu Ding would have said of the toothache we have just considered, that it had been “caused” by my uncles. The differences in the explanatory mechanisms are, of course,

⁴⁸ *Heji* 10349, 13643.

⁴⁹ *Heji* 773A.

⁵⁰ S301.3-4; Y824.2-25.1.

⁵¹ Keightley *Sources*, p. 85, n. 112.

⁵² See n. 45.

⁵³ Keightley, “Reports from the Shang,” pp. 31, 34-37.

profound. Wu Ding clearly believed that his uncles still played an active role in his life, were capable of malevolence, and could be placated through ritual and sacrifice. The cause and effect mechanisms of Shang medicine, like those of the medicine of our own post-Mendelian age in which one would think of genes, cholesterol levels, and anti-coagulants, were the mechanisms of its dominant culture.⁵⁴

It may also be supposed that the placebo effect, or, more accurately perhaps, the patient's confidence in the divination process and in the ancestors, was powerful for the Shang king:"⁵⁵ the choice of the right day, the selection of the right number of victims, and the identification of the right ancestor would have all generated reassurance and encouraged cure. The situation among the Ixil of Mesoamerica is instructive. Their

ritual therapy ... may easily be just as effective, if not more so, than psychotherapy. Modern biological science has shown that there is no clear-cut line between placebo or psychosomatic effects and purely physical or biological ones.... Divination provides a sense of personal control that reduces the effects of stress and hence can have real curative power. Of equal importance with the curative effects of divination are the other consequences: divination and its associated beliefs regulate social relations and encapsulate a view of the social world and moral order.⁵⁶

I suspect indeed that the ritually-freighted act of incising the oracle-bone inscriptions into the bone added to the curative impact, both theological and psychological, of the divinations and sacrifices.⁵⁷

⁵⁴ Other continuities are also present. As Ronald Grimes, *Beginnings in Ritual Studies* (Washington, D.C.: University Press of America, 1982), pp. 126–27, has noted, “Therapies, both primitive and modern, generally employ ritual sacrifice as a means of restoring diseased relations....Modern surgery, Christian communion, and tribal scarifice [sic] are ritually equivalent....”

⁵⁵ Marvin M. Lipman, “Great Expectations,” *Consumer Reports on Health* (September 2001), writes: “An article in a May issue of the *New England Journal of Medicine* disputes the generally accepted finding that placebos improve symptoms at least 30 percent of the time. In clinical practice the most convincing placebo is the assurance the patient feels that something is being done and the patient's confidence in the professional rendering that service. A British study... showed that the physician's positive attitude produced better recovery – whether or not the patients received any other treatment.... Apparently what matters is that the patient – and especially the doctor – believe that improvement will occur.”

⁵⁶ Benjamin N. Colby and Lore M. Colby, *The Day Keeper: The Life and Discourse of an Ixil Diviner* (Cambridge, Mass.: Harvard U.P., 1981), pp. 222–23.

⁵⁷ For explorations of why the Shang bothered to incise the inscriptions, see Olivier Venture, “Étude d'un emploi rituel de l'écrit dans la Chine archaïque (XIII^e–VIII^e siècle avant notre ère): Réflexion sur les matériaux épigraphiques des Shang et de Zhou Occidentaux” (Ph.D. diss., Université Paris 7, 2002 /Denis Diderot), pp. 219–32, 247, 267; David N. Keightley, “Marks and Labels: Early Writing in Neolithic and Shang China,” in Miriam T. Stark, ed., *An Archaeology of Asia* (Oxford: Blackwell), in press.

Prognosis

The role that prognosis played in Shang divination in general might also have provided another avenue for providing psychological comfort to the sick, a comfort not always available to patients in the modern world.⁵⁸ As Nicholas Christakis noted in the course of a *New York Times* interview,

If you think about it, treatment and prognosis are alternative ways that doctors can cope with illness. ... About 100 years ago, when physicians were at a very critical historical moment and they realized that their treatments were relatively ineffective, prognosis had incredible salience. Patients came to doctors and doctors cultivated the ability to predict what would happen. But as doctors acquired more effective treatments, the impetus to prognosticate declined. There is this presumption that the disease will be treated and eliminated.... A lack of attention to prognostication can lead to patients' dying badly.⁵⁹

But it is of some interest that the Shang king's prognoses, his forecasts, if he ventured to make them, were rarely if ever recorded in cases of illness. Among some 500 divination charges involving *ji* 疾, “illness, sickness,”⁶⁰ I have found only two plastrons that actually record medical prognostications in a useful way.

INSCRIPTION 9

貞：斨其出疾。王固曰：斨其出疾丙不庚。二十七日庚申喪？命？

Divined: “Yin might be sick.”⁶¹ (Prognostication:) His Majesty read the cracks and said: “Yin's being sick should be on a *bing*-day; if not, it will be on a *geng*-day.” (Verification:) On the twenty-seventh day, on *gengshen* (day 57), he lost (his) life (?).⁶²

⁵⁸ See Nicholas A. Christakis, *Death Foretold: Prophecy and Prognosis in Medical Care* (Chicago: U. of Chicago P., 1999).

⁵⁹ Gina Kolata, “A Doctor With a Cause: ‘What’s My Prognosis?’ – A Conversation with Nicholas Christakis,” *New York Times* (November 28, 2000), p. D7.

⁶⁰ Y1177.1–84.2. The charge, prognostication, and verification of item 9 suggest that *ji* 疾 could refer to an acute or fatal sickness, a reading supported by the early meaning of “urgent, violent, or hurried” that was also present in the word; e.g., Bernhard Karlgren, *Grammata Serica Recensa* (Stockholm: Museum of Far Eastern Antiquities, 1957), no. 494a-c; Alex Schuessler, *A Dictionary of Early Zhou Chinese* (Honolulu: U. Hawaii P., 1987, p. 269). Unschuld, *Medicine in China*, p. 20, proposes “bedridden.”

⁶¹ The inscriptions transcribed at Y1017.1–2 indicate that Yin was a person of consequence under Wu Ding. The inscription on *Heji* 13751f (Y693.1) (= *Yibian* 5397) also records Yin's death, but I am unable to translate it satisfactorily. The abbreviation “*Yibian*” refers to Dong Zuobin 董作賓, *Xiaotun dierben: Yinxi wenzi, yibian* 小屯第二本, 殷虛文字乙編 (Guoli Zhongyang yanjiuyuan lishi yuyan yanjiusuo; part 1, Nanjing, 1948; part 2, Nanjing, 1949; part 3, Taipei, 1953).

⁶² *Heji* 13752f. My translation of parts of item 9 is tentative. According to the transcription

At least Yin – or the king – had the satisfaction of knowing that Yin had died on the second of the two days that the king had forecast.

The second plastron presents a quite extensive Late Shang medical history. It involved three prognostications (inscriptions 10C, 10U, 10V), the first of which appears to have been more in the nature of an injunction, a spell, than a forecast:

INSCRIPTION 10A

貞：𠄎疾身佳𠄎害

Divined: “There being a sick stomach is due to (ancestral) harm.”

INSCRIPTION 10B

庚戌卜𠄎貞：王其疾骨<二告>

Making cracks on *gengxu* (day 47), Xuan divined: “His Majesty might be sick in the bone.” <(Crack notation:) “Two reports.”>⁶³

INSCRIPTION 10C

庚戌卜𠄎貞：王弗疾骨。王固曰：勿疾<二告>

Making cracks on *gengxu* (day 47), Xuan divined: “His Majesty will not be sick in the bone.” His Majesty read the cracks and said: “Do not let (some ancestor) cause the sickness.”⁶⁴ <(Crack notation:) “Two reports.”>

INSCRIPTION 10D

貞：婦弗其克興𠄎疾

Divined: “Lady (Hao) might recover from her sickness.”⁶⁵

INSCRIPTION 10E

貞：婦好克興𠄎疾

Divined: “Lady Hao will recover from her sickness.”

for *Heji* 13752b offered at Y1181.2, the back of this plastron contained the prognostication “王固曰：𠄎疾𠄎 His Majesty read the cracks and said: ...will not be sick...” I cannot, however, verify this with certainty in the rubbing of either *Heji* 13752b or *Yibian* 4131. It would, however, appear to represent another instance of a reassuring prognostication.

⁶³ On the possible meanings of the *er gao* 二告 crack notation, which was certainly auspicious, see Keightley, “Reports from the Shang.”

⁶⁴ In translating the prognostication in this way, I benefit from the advice of Ken-ichi Takashima (personal communication, June 6, 2000), who notes that verbs governed by *wu* 勿 are controllable (“Morphology of the Negatives in Oracle-Bone Inscriptions,” *Computational Analysis of Asian and African Languages* 30 [1988], p. 118), and that in this case the *ji* 疾 was being controlled by some spirit. He has elsewhere (idem, “An Evaluation of the Theories Concerning the Shang Oracle-Bone Inscriptions,” *The Journal of Intercultural Studies* [Kansai University] 15–16 [1988–89], p. 52) translated the prognostication as “Do not make (me) suffer.”

⁶⁵ For the reading of *ke xing* 克興 as “successfully recover,” see David S. Nivison, “The Pronominal Use of the Verb *Yu* (giüg: 𠄎, 𠄎, 𠄎, 有) in Early Archaic Chinese,” *EC* 3 (1977), p. 9.

INSCRIPTION IOF

貞: 婦虬

Divined: “Lady (Hao) will improve.”⁶⁶

INSCRIPTION IOG

不其虬

(Lady Hao) might not improve.

A series of charge-pairs was then divined: was a certain Prince to make offerings to Father Yi (K₂₀, Wu Ding’s father) (inscriptions H-J)? Were offerings to be made to Ancestress Ji (Bi Ji 妣己, the consort of Ancestor Ding, 祖丁, K₁₅, Wu Ding’s grandfather) (inscriptions KL)? And were prisoners (*fu* 虜) to be offered, four of them or ten of them, to Ancestor Xin (祖辛, K₁₃, Wu Ding’s great-grandfather) (inscriptions IOM-Q)? The diviners then ended their ritual prophylaxis on the front of the plastron with:

INSCRIPTION IOR

貞: 于羌甲禦

Divined: “(We should,) to Qiang Jia (K₁₄) perform the exorcism ritual.”

INSCRIPTION IOS

勿于羌甲禦

“(We) should not, to Qiang Jia, perform the exorcism ritual.”⁶⁷

Additional divinatory records were incised into the back of the plastron, some repeating the wish that Lady Hao would recover, some repeating the charge about making an offering to Ancestor Xin, some about offering an exorcism ritual to Ancestress Geng (Bi Beng, 妣庚, who could have been the consort of any one of Wu Ding’s four immediate paternal ancestors), some, again, about an offering to Ancestor Ding, and also including:

INSCRIPTION IOU

王固曰: 吉. 三禦一羌虬

His Majesty read the cracks and said: “Auspicious. We will perform three exorcisms and (offer) one Qiang (human victim); she will improve.”

⁶⁶ On oracle bone *long* 龍 (“dragon”) read as *qiu* 虬, see n. 42, above.

⁶⁷ *Heji* 709f.

INSCRIPTION 10V

王固曰：吉。克興

His Majesty read the cracks and said: "Auspicious. She can recover."⁶⁸

I am not certain that my translations (especially of inscription 10U) are correct in every case, but the general situation recorded on this plastron is fairly clear.⁶⁹ There seems to have been much illness in the royal community. Somebody had a sick stomach (inscription 10A); the king was suffering from some bone ailment (perhaps arthritis?) (inscriptions 10BC); and Lady Hao, his consort, was also sick inscriptions 10DG), perhaps with the sick stomach (see inscriptions 13AB). The king responded by divining the situation. The auspicious crack notations he obtained in inscriptions 10BC presumably served to reassure him that his own bone problems would be resolved favorably; this undoubtedly lent force and confidence to his prognosticatory injunction, inscription 10C "Do not let (some ancestor or other Power) cause the sickness." He then turned his attention to Lady Hao's medical problems, proposing as a charge to the ancestors the wish that she would get better, that she would recover, weakening the undesirable charge in each charge-pair with *qi* 其, in this context, serving as the "might" particle of uncertainty (inscriptions 10DG).⁷⁰

The king then considered offering a variety of rituals and victims to various ancestors and ancestresses, specifically to the four previous kings (three on the main line of descent and one, Qiang Jia, collateral) and to two previous consorts). In two cases, exorcism rituals were to be addressed to both a former king, Qiang Jia (inscriptions 10RS), and a former consort, Ancestress Geng, presumably on behalf of Lady Hao.

⁶⁸ *Heji* 709b.

⁶⁹ The clarity of the situation is obscured, however, by uncertainty about the order in which the charges on this plastron may have been divined. The absence of prefatory day-dates for all but two (items 10B–C) of the forty divinatory inscriptions recorded on the front and back of the plastron – were all the "medical" divinations performed on the same day, *gengxu*? – means that scholars have not always agreed on the sequence of the divinations. In my account above I have followed the ordering proposed by Zhang Bingquan 張秉權 in his commentary to idem, *Xiaotun dierben: Yinxi wenzi bingbian* 小屯第二本，殷虛文字丙編 (Taipei: Zhongyang yanjiuyuan lishi yuyan yanjiusuo) 1.1 (1957); 1.2 (1959); 2.1 (1962); 2.2 (1965); 3.1 (1967); 3.2 (1972); hereafter, *Bingbian*) 334–335 (he altered in some cases the sequence he had proposed when he first published part of the plastron as *Bingbian* 251–252). The sequence given by the Y editors for *Heji* 709f differs in detail.

⁷⁰ For an introduction to the scholarship and functions of oracle-bone *qi*, see Ken-ichi Takashima, "The Modal and Aspectual Particle *Qi* in Shang Chinese," in Robert H. Gassman and He Leshi, eds., *Papers of the First International Congress on Pre-Qin Chinese Grammar* (Changsha: Yuelu shushe, 1994), pp. 479–565, and idem, "Toward a New Pronominal Hypothesis of *Qi* in Shang Chinese," in Philip J. Ivanhoe, ed., *Chinese Language, Thought, and Culture: Nivison and His Critics* (Chicago: Open Court, 1996), pp. 3–38. The "might" is my own solution to translating the word in such contexts.

It is hard to explain the medical theology that may have been involved in these ritual proposals. It may be noted, for example, that Qiang Jia (inscriptions 10RS) was only a collateral king; the brother of Ancestor Xin (祖辛, K13), he was not on the *dazong* 大宗, the main line of descent.⁷¹ It is possible, accordingly, that Qiang Jia was a suitable recipient of the exorcism because he was thought to have influence on the health of Lady Hao, who would herself have been from an external lineage. But this was certainly not the invariable rule of Late Shang ceremonial prophylaxis. Wu Ding, on the plastron above, proposed offerings to a number of his direct-line male ancestors. And in another instance, presumably divined to once again protect Lady Hao from ancestral harm, Wu Ding performed the exorcism to his own father, who most emphatically was on the main line of descent:

INSCRIPTION 11

己卯卜般貞：禦婦好于父乙斲羊又豕卅十宰

Making-cracks on *jimao* (day 16), Que divined: “In performing the exorcism for Lady Hao to Father Yi (Wu Ding’s father, Xiao Yi, K20), (we) cleave a sheep and a pig and pledge ten penned sheep.”⁷²

Perhaps, as her health deteriorated – and we know that she died before Wu Ding did⁷³ – Wu Ding wanted to increase the strength of the ritual medicine he offered, both by, in the case of inscription 11, by appealing to his father and by increasing the size of the offerings. In the current instance, in any event, the king’s prognoses, inscriptions 10JK had been strongly favorable: “she will improve, she can recover.”

That Shang prognoses were relatively rare where illness was concerned may well have reflected a realistic appraisal of the limits of Shang medical prophylaxis. That, in one survey, only 20 percent of modern diagnoses proved accurate suggests that Shang medicine might have been no more effective than our own in this important regard.⁷⁴ But the strength of the divinatory treatment of the ill, the strength of the Shang ritual prophylaxis, evidently lay in the religious assurance

⁷¹ On the *dazong*, see, e.g., Keightley, “At the Beginning,” p. 38, n. 119; idem, “The Shang: China’s First Historical Dynasty,” in Michael Loewe and Edward L. Shaughnessy, eds., *The Cambridge History of Ancient China: From the Origins of Civilization to 221 B.C.* (New York: Cambridge U.P., 1999), p. 256, n. 5.

⁷² *Heji* 271f.

⁷³ Keightley, “At the Beginning,” pp. 36–37, nn. 115, 116.

⁷⁴ Christakis has noted (see Kolata, “Doctor with a Cause”): “I just published a study a few months ago in *The British Medical Journal* in which we looked at physicians’ prognoses in 500 terminally ill patients. We found that with a very liberal standard of accuracy only 20 percent of the prognoses were accurate. On average, physicians overestimate survival by a factor of 5.3.”

that it would have accorded its patients, as auspicious crack notations were announced, sacrifices were offered, and exorcisms (see too below) were performed on their behalf.

Exorcism

The Shang diviners, in short, did not put much emphasis on medical prognosis. Instead, in addition to offering sacrifices to the causers of the illness, the Shang, as we have seen in inscriptions 10RS and 11, would frequently conduct an apotropaic, warding-off exorcism when sickness struck,⁷⁵ as in:

INSCRIPTION 12

貞：疾趾于妣庚禦

Divined: “For the sick foot, (we will) to Ancestress Mother Geng perform an exorcism.”⁷⁶

INSCRIPTION 13A

貞：屮疾身禦于祖丁

Divined: “There being a sick stomach, (we will) perform an exorcism to Ancestor Ding (K15).”

INSCRIPTION 13B

貞：婦好其延屮疾

Divined: “As for Lady Hao, there might be a prolonging of her being sick.”⁷⁷

Such exorcism rituals might also, as in inscription 11, involve the offering of sacrifices:

INSCRIPTION 14

貞：禦于三父三伐

Divined: (We will) perform an exorcism to the three Fathers (K17-19), (with) three dismembered victims.”⁷⁸

INSCRIPTION 15

貞：禦于父乙屮三牛卅三十伐三十宰

Divined: “In performing the exorcism to Father Yi (K20), (we) cleave three cows, pledge thirty dismembered victims, thirty penned sheep.”⁷⁹

It is of some interest that in these and other cases the Shang approach to their ancestors appears to have been contractual. They

⁷⁵ For the extensive scholarship on oracle-bone *yu* 禦, see *Sōran* 0207; also Unschuld, *Medicine in China*, p. 21; Li, “Cong jiaguwen kan,” p. 376.

⁷⁶ *Heji* 13689; Y1178.1.

⁷⁷ *Heji* 13713f.

⁷⁸ *Heji* 930.

⁷⁹ *Heji* 886.

pledged large or important offerings “on account” (inscriptions 11, 15, 16, 23), with the actual offering either to be made after the ritualist’s prayer had been answered, or consisting only of the “paper” – or, more accurately, “bone” – pledge. Such pledges, in fact, are often notable for the number of victims stipulated, as in:

INSCRIPTION 16

𠄎卜爭貞：燎𠄎百羊百牛百豕穀五十

Making cracks on..., Zheng divined: “In making burnt offering, (we) pledge one hundred sheep, one hundred cows, one hundred pigs, and piglets, fifty.”⁸⁰

Presumably, in such cases, Wu Ding would only have sacrificed the victims pledged if the exorcism had proved medically effective.

Child-Birth

The Shang diviners also paid considerable attention to child-birth, specifically to its timing and its auspiciousness:

INSCRIPTION 17A

貞：今五月媿

Divined: “In the present fifth moon, she will give birth.”

INSCRIPTION 17B

貞：于六月媿

Divined: “When it comes to the sixth moon, she will give birth.”⁸¹

INSCRIPTION 18A

甲申卜般貞：婦好媿嘉。王固曰：其佳丁媿嘉其佳庚媿引吉。三旬又日甲寅媿允不嘉佳女

(Preface:) Making cracks on *jiashen* (day 21), Que divined: (Charge:) “Lady Hao’s childbearing will be good.” (Prognostication:) His Majesty read the cracks and said: “If it be a *ding*-day childbearing, it will be good; if it be a *geng*-(day) childbearing, there will be prolonged luck.” (Verification:) (After) thirty-one days, on *jiayin* (day 51), she gave birth; it was not good; it was a girl.

INSCRIPTION 18B

甲申卜般貞：婦好媿不其嘉。三旬又日甲寅媿允不嘉佳女

(Preface:) Making cracks on *jiashen* (day 21), Que divined: (Charge:) “Lady Hao’s childbearing might not be ‘good.’” (Veri-

⁸⁰ *Yingcang* 1256 (Y1135.1) = *Jinzhang* 670 (S424.2).

⁸¹ *Heji* 116f.

fication:) (After) thirty-one days, on *jiayin* (day 51), she gave birth; it really was not good; it was a girl.⁸²

INSCRIPTION 18C

王固曰：其佳丁婉嘉。其庚引吉其佳壬戌不吉

(Prognostication:) His Majesty read the cracks and said: “If it be a *ding*-(day) childbearing, it will be good; if (it be) a *geng*-day (childbearing), there will be prolonged luck; if it be a *renxu* (day 59) (childbearing), it will not be lucky.”⁸³

Apart from the preference for male progeny recorded in the prognostications of inscriptions 18AB – comprehensible in a patrilineal dynasty – one may notice the concern with time (see below): some *gan* 干 days (like *ding* and *geng* in this case) were lucky, others (like the *ren* of *renxu*) were unlucky.⁸⁴ And because the ten *gan* used to name the days of the Shang week were also used in the temple names of the ancestors, like the Father Jia, Father Geng, and Father Xin of inscriptions 8E-J, the king’s obstetric prognostications – “this day the birth would be good, that day it would not be lucky” – were once again situated in a context that was rich with ancestral significance. And once again, one notes the desire to record both the prediction and the result. The birth had occurred on *jiayin* (inscriptions 18AB). The king’s prognostications, which had referred only to *ding*, *geng*, and *renxu*, was thus rendered irrelevant. And yet it was important that what he had actually forecast be recorded.⁸⁵

A Time for Dying

One remarkable medical record suggests the degree to which the Shang diviners, in a case involving life and death, were prepared to pursue it to its bitter end:

INSCRIPTION 19

[甲]申卜貞：蜀克興出疾旬出二日[乙]未蜀允克[興出疾]百日出七旬出[五]日[戊]寅蜀亦出疾[乙未]夕翌丙申[蜀]死

Making cracks on [*jia*] *shen* (day 21), divined: “Shu will successfully recover from his sickness.” (Verification:) On the 12th day, [*yi*] *wei*

⁸² *Heji* 14002f.

⁸³ *Heji* 14002b. For discussion of this plastron and its cracks, as *Bingbian* 247.1–2 (S309.2), see David N. Keightley, “How the Cracks Were Read: The Existence of the Subcharge,” paper presented at the Annual Meeting, American Oriental Society, Toronto, April, 1978, pp. 7–10; idem, “Divination and Kingship,” pp. 11–14.

⁸⁴ Ji Dewei 吉德煒 (David N. Keightley), “Zhongguo gudai de jiri yu miaohao” 中國古代的吉日與廟號, *Yinxu bowuyuan yuankan* 殷墟博物院苑苑刊 (創刊號), inaugural issue, 1989, pp. 20–32.

⁸⁵ I pursue the accuracy and honesty of the divinatory record more fully in Keightley, “Theology.”

(day 32), “Shu really did [successfully recover from his sickness.] On the 17[5]th day, [*wu*yin (day 15), Shu again had a sickness. In the night when [*yiwei*] cleaved to *bingshen* (day 33) [Shu] died.”⁸⁶

This tantalizing fragment raises as many questions as it answers. The few other inscriptions in which Shu appears provide no indication as to why his medical history was thought worth recording in this detail and over this extended a time period.⁸⁷ Nor do we know what, if any, ritual prescriptions were offered to alleviate his condition, either at the onset of his sickness, when he initially got better, or over the course of the subsequent 175(?) days before he died. That the diviner – and presumably the king – kept track of the patient’s subsequent history for half a year after the initial divination is, perhaps, little more than a three-thousand-year-old medical curiosity.⁸⁸ We can, however, note that the dates of the *ganzhi* days were evidently important to the case, perhaps because they were associated with the ancestors whose temple names were those of the *gan* that were used to name the days, the *jia* of the day of divination, the *yi* of the day when he first recovered. And we can note, finally, that Shu died in the middle of the night, on the “cusp” between two *ganzhi* days, a liminal time when some Shang childbirths also took place and when the king dreamed, inspired sometimes by his ancestors.⁸⁹ The middle of the night, when no “ancestral” sun was in the sky,⁹⁰ may well have been a particularly perilous time.

⁸⁶ *Heji* 13753. My transcription and translation are tentative (see David N. Keightley “The Diviners’ Notebooks: Shang Oracle-Bone Inscriptions as Secondary Sources,” in Yau Shun-chiu and Chrystelle Maréchal, eds., *Actes du Colloque International Commémorant le Centenaire de la Découverte des Inscriptions sur Os et Carapaces; Proceedings of the International Symposium in Commemoration of the Oracle-Bone Inscriptions Discovery* [Paris: Éditions Langages Croisés, 2001], p. 14, n. 18), but it does appear that the verification was recorded over a time span of half a year (i.e., 175-plus days) after the charge was first divined. A study of the calligraphy further suggests that the entire inscription, including the charge, may have been incised into the bone at one time – that is, 175 days or more after the charge had originally been proposed.

⁸⁷ Y687.2; S243.4. It would appear that Shu was an ally of Wu Ding, who was to “strengthen His Majesty’s affairs” (*gu wang shi* 固王事) and to whose lands the king would on occasion travel (see the inscriptions at S106.3; Y222.2).

⁸⁸ Presumably, this record, like the divinatory records in general, was initially kept on some other material – what I have elsewhere called “the diviners’ notebooks” – before it was incised into the bone (David N. Keightley, “Were the Shang Kings Literate? Who Read the Shang Texts and Why?: Reflections on Early Chinese Literacy and Scribal Practice,” paper presented to the panel, Literacy in Ancient China, Center for Chinese Studies, Berkeley, February, 1997, pp. 14–18; and idem, “The Diviners’ Notebooks”).

⁸⁹ See the inscriptions at Y1079.1–2; childbirth: *Heji* 6948f, 14003, 14020; dreams: *Heji* 376f, 17375, 17396.

⁹⁰ On the solar links in Shang religion and mythology, see Allan, *Shape of the Turtle*, pp. 19–56; Keightley, “Graphs, Words, and Meanings: Three Reference Works for Shang Oracle-Bone Studies, With an Excursus on the Religious Role of the Day or Sun,” *JAOAS* 117 (1997), pp. 517–24.

Divinatory Diagnosis: Character and Consequences

The Late Shang kings and diviners, as we have seen, diagnosed illness by proposing to the divinatory shell or bone (and thus to the ancestors) a series of ancestral etiologies; they cured, or attempted to cure, illness by ritual medicine – offering cult, sacrifice, and exorcism to placate or defend against the ancestral agents whom the cracks had revealed were the cause of the illness. The diviners’ posing of various choices (as in inscriptions 8E-L) and the contractual nature of the sacrificial pledges they offered (inscriptions 11, 15, 16, 23) may be regarded as a form of theological experiment, a form of hypothesis-testing. The system was highly structured and, like Shang divination in general, left no room for diagnoses whose terms differed from those originally proposed by the diviner in his charges.

This is not to say that the Shang may not, on occasion, have been unaware of the role that other factors might play in illness. Consider the following four charges on the front, and the prognostication on the back, of a large plastron fragment:

INSCRIPTION 20A

甲寅卜殷貞：翌乙卯易日

Making cracks on *jiayin* (day 51), Que divined: “On the next day, *yimao* (day 52), it will be sunny.”

INSCRIPTION 20B

貞：翌乙卯不其易日

Divined: “On the next day, (day 52), it might not be sunny.”

INSCRIPTION 20C

貞：出疾鼻出害

Divined: “There being a sick nose (is due to ancestral) harm.”

INSCRIPTION 20D

貞：出疾鼻不佳出害

Divined: “There being a sick nose is not due to (ancestral) harm.”⁹¹

INSCRIPTION 20E

王固曰：之勿雨卯[于?]明霧三[食]日大晴

His Majesty read the cracks and said: “On that [day, there will be disasters, but] it should not rain.” (Prognostication:) On [*yi*]*mao*...

⁹¹ *Heji* 11506f.

at dawn it was overcast; when it came to the time of the ... meal, the day greatly cleared.”⁹²

In this case, inscriptions 20C and D indicate that somebody, probably Wu Ding, was suffering from some kind of nasal condition (a stuffy nose, perhaps?); it was accordingly of some interest to him whether or not the next day was going to be sunny (inscriptions 20A, B, E). It is possible to think that he or his diviners saw a connection between the nose and the weather.⁹³

But this is far from certain. Hector Avalos, in considering illness in the ancient Near East, has proposed distinctions that may also throw light on the Shang case:

One of the most important polarities is between what we shall term utopian and realist views of illness etiology and prognosis. We shall characterize as utopian the view that the cause of illness follows a regular and systematic cause and effect and can be fully understood by the patient. A realist view regards the causes of illness as ones which cannot always be understood. ... acknowledges that not all illnesses are curable.⁹⁴

I would suspect that Shang medical practice, at least as we see it in the oracle-bone inscriptions, was primarily utopian in nature, believing that all illnesses were potentially understandable, if one could hit upon appropriate divinatory formulas and rituals. The state of the weather was probably a secondary concern.

Avalos further introduces a related question about “the extent to which divine beings use illness as an instrument.” In the utopian view,

⁹² *Heji* 11506b. For *shi ri* 食日 and other time-phrases, see Keightley *Ancestral Landscape*, p. 19, n. 9. Song Zhenhao 宋鎮豪, “Shilun Yindai de jishi zhidu, jianlun Zhongguo gudai fenduan jishi zhidu” 試論殷代的計時制度兼論中國古代分段記時制度, in Hu Houxuan 胡厚宣, ed., *Quanguo Shangshi xueshu taolunhui lunwenji* 全國商史學術討論會論文集 (N.p.: Yindu xuekan, 1985), p. 312, gives a useful chart of the time words throughout the Shang day, with *shi ri* situated in the morning, before noon (which would suit the context of inscription 20E). See too Wen Shaofeng 溫少峰 and Yuan Tingdong 袁庭棟, *Yinxu buci yanjiu: kexue jishu pian* 殷墟卜辭研究科學技術篇 (Sichuan shehui kexueyuan, 1983), p. 72. Yao Xiaosui 姚孝遂, “Du ‘Xiaotun nandi jiagu’ zhaji” 讀“小屯南地甲骨”劄記, *Guwenzi yanjiu* 古文字研究 12 (1985), pp. 116–17, treats the phrase as equivalent to the Shang phrase *dashi* 大食 (“time of the great meal,” mid morning, citing *Tunnan* 624, 42). I am not sure how to translate *shi ri* but presumably it meant something like “when it was meal time” (James Legge, trans., *The Chinese Classics: Volume V, The Ch’un Ts’ew with The Iso Chuen* [London: Trübner, 1872; cited in rev. edn., Taipei, Wen-zhe, 1972], p. 604, so translates the phrase as it appears in *Zuozhuan*, Zhao 5).

⁹³ Unfortunately, this is the one instance in which a “sick nose” was divined; the other ailments – sick teeth, feet, eyes, head, mouth, etc. (Y1177.2–79.1) – are not so easily linked to the weather.

⁹⁴ Hector Avalos, *Illness and Health Care in the Ancient Near East: The Role of the Temple in Greece, Mesopotamia, and Israel* (Atlanta, Ga.: Scholars Press, 1995), pp. 31.

“the deity uses illness as an instrument whose mechanisms are not only fully understood by the patient, but also are regarded as just.” In the realist view, “a deity may use illness for purposes which are not always disclosed to the patient. A divine being (e.g., a demon) may use illness for seemingly arbitrary or malevolent purposes.”⁹⁵ I would suspect that, in these terms, the Shang, with their etiology of ancestral intervention were, dealing with the persona of ex-humans,⁹⁶ both realist and utopian. Justice was not the issue; the benevolence of the ancestors, especially of the recently dead, was by no means assured; but, for the ancestors’ descendants, it was ritually negotiable.

ENUMERATION AND REGULARITY

To the extent that science and technology and at least certain types of natural philosophy involve attention to numbers and their significant regularities, it is worth noting that Wu Ding’s diviners were often concerned with getting the numbers right. The sets of divination charges frequently involved units of five or ten cracks, and the cracks were generally numbered in sequence, from “1” to “10.”⁹⁷ Presumably, the diviners numbered the cracks so that they could match the initial readings, recorded in their notebooks,⁹⁸ with the inscriptions that their engravers eventually incised next to the cracks in the bones. The impulse to enumerate in this case was thus – to the extent that the two impulses can be distinguished – primarily bureaucratic rather than scientific.⁹⁹

It should also be noted that the Shang diviners occasionally made use of piles of six numbers that presumably recorded the results of manipulating bamboo strips, milfoil stalks, or other rod-like objects that could be counted. These functioned as a form of pre-pyromantic divination and were presumably ancestral to the hexagrams of the *Zhouyi*

⁹⁵ Ibid.

⁹⁶ David N. Keightley, “The Making of the Ancestors: Late Shang Religion and Its Legacy,” in John Lagerwey, ed., *Chinese Religion and Society: The Transformation of a Field* (Hong Kong: École Française d’Extrême-Orient and the Chinese U. of Hong Kong P.), in press.

⁹⁷ For the crack-numbers and the numbers of cracks per set, see Keightley, *Sources*, p. 38. Pang Pu, “Origins of the Yin-Yang and Five Elements Concepts,” *Social Sciences in China* (Spring, 1985) [orig. pub. as “Yinyang wuxing tanyuan” 陰陽五行探原, *Zhongguo shehui kexue* 中國社會科學 (1984.3), pp. 75–98], pp. 94–103; and Allan, *Shape of the Turtle*, pp. 101–2, discuss the possible links between Shang numbers and cosmology.

⁹⁸ See n. 86.

⁹⁹ The possibility that the numbered cracks also figured in some kind of averaging or counting off of results, so that a prognostication of “Auspicious” was the result of a “three out of ten cracks” approach or a contextual reading of the cracks against each other, is not yet known; such information, in fact, may be unrecoverable.

周易.¹⁰⁰ This indicates that numbers, in certain Shang contexts, could be endowed with mantic and spiritual value. Numbers might be important for both secular and religious reasons.

The Shang kings, for example, paid considerable attention to the numbers of game animals caught in the royal hunts and to the numbers of victims offered in sacrifice. The diviners would, on occasion, record the success of the royal hunts in specific detail, as in the following verification,¹⁰¹

INSCRIPTION 21

癸卯允焚獲 [兕] 十一豕十五虎 □ 斃廿

On *guimao* (day 40) (we) really did burn the brush (in hunting) and caught [wild buffalo,] eleven; pigs, fifteen; tigers, ...; young deer, twenty.¹⁰²

Such records were presumably kept because they documented the favor of the Powers; the initial divination charge in this case had sought to determine if the Shang should or should not hunt by burning the brush.

In the case of sacrifices, as we have seen in inscriptions 11, 14, 15, and 16, the number of victims offered was often an important part of the ritual, *do ut des* contract that the king, through his divinations, negoti-

¹⁰⁰ For a recent review of the evidence, see Chao Fulin 晁福林, “Shang dai Yigua shifa chutan” 商代易卦筮法初探, *Kaogu yu wenwu* 考古與文物 (1997.5), pp. 58–62, 14; Zhang Zhenglang 張政娘, “Shishi Zhouchu qingtongqi mingwen zhong de yigua” 試釋周初青銅器銘文中的易卦, *Kaogu xuebao* (1980.4), pp. 403–15 (trans. Jeffrey R. Ching et al., “An Interpretation of the Divinatory Inscriptions on Early Chou Bronzes,” *EC* 6 [1980–81], pp. 80–96); Zhang Yachu 張亞初 and Liu Yu 劉雨, “Cong Shang Zhou ba gua shuzi fuhao tan shifa de jige wenti” 從商周八卦數字符號談筮法的幾個問題, *KG* (1981.2), pp. 155–63, 154 (trans. Edward L. Shaughnessy, “Some Observations about Milfoil Divination Based on Shang and Zhou *bagua* Numerical Symbols,” *EC* 7 [1981–82], pp. 46–55); Li Xueqin 李學勤, “Zhujiàn buci yu Shang-Zhou jiaju” 竹簡卜辭與商周甲骨, *Zhengzhou daxue xuebao* 鄭州大學學報 (1989.2); Keightley, “Divination and Kingship,” pp. 379–89; Li Xueqin and Peng Yushang 彭裕商, *Zhouyi jingzhuān suyuan cong kaoguxue, wenxianxue kan* 周易經傳溯源從考古學文獻學看“周易” (Changchun: Changchun chubanshe, 1992); and Léon Vandermeersch, “La Filiation chéloniomantique de L’Achilléomancie,” in Yau Shun-chiu and Chrystelle Maréchal, eds., *Actes du Colloque International Commémorant le Centenaire de la Découverte des Inscriptions sur Os et Carapaces; Proceedings of the International Symposium in Commemoration of the Oracle-Bone Inscriptions Discovery* (Paris: Éditions Langages Croisés, 2001), pp. 63–70.

¹⁰¹ For some fifty verifications of this sort, generally from Period I, see the *yun huo* 允獲, “(we) really did catch,” entry at S489.3–4 (the entry at Y19.1 is incomplete).

¹⁰² *Heji* 10408f. I follow, with some adjustments, the translations of *Bingbian* 102.1 offered by Paul Serruys, “Towards a Grammar of the Language of the Shang Bone Inscriptions,” *Zhongyāng yánjiūyuán guójiā Hānxue huìyì lūnwénjī: Yuyan wenzī zū* 中央研究院國際漢學會議論文集, 語言文字組 (Taipei: Academia Sinica, 1981), p. 326; and Takashima, “Particle *Qi*,” p. 498. For the view that the oracle-bone graph that I read as *si* 兕 referred to a type of wild buffalo, see J. A. Lefeuve, “Rhinoceros and Wild Buffaloes North of the Yellow River at the End of the Shang Dynasty: Some Remarks on the Graph 兕 and the Character 兕,” *MS* 39 (1990–91), pp. 131–57.

ated with his ancestors.¹⁰³ How this worked can be seen in the following seventeen charges, which I have selected – from the fifty charges on the large, almost whole, plastron – because these were the charges that involved numbers of victims. The charges were divined over at least a twelve-day period (inclusive count), from *jiawu* (day 31) to *yisi* (day 42), and the period of divinatory concern extended prospectively at least another eleven days, to *yimao* (day 52).¹⁰⁴

INSCRIPTION 22A

貞：酈王亥

Divined: “(We will offer) a *you*-cutting sacrifice (to) Wang Hai.”¹⁰⁵

INSCRIPTION 22B

夕二羊二豕，𧇧三羊三豕

“(We will perform) the *yong*-eve ritual (with) two sheep, two pigs; (we will perform) the *yi*-ritual (with) three sheep, three pigs.”

INSCRIPTION 22C

夕反尹，(𧇧)二羊二豕

“(We will perform) the *yong*-eve ritual (with) one sheep, one pig; (we will perform) the *yi*-ritual (with) two sheep, two pigs.”

INSCRIPTION 22D

貞：呼雀酈于河五十[牛]

Divined: “(We) call upon Qiao to perform the *you*-cutting sacrifice to the (Yellow) River Power (with) fifty [cows].”

INSCRIPTION 22E

酈五十牛于河

“(Qiao should perform) the *you*-cutting sacrifice (with) fifty cows to the (Yellow) River Power.”

INSCRIPTION 22F

勿五十牛于河

“(Qiao) should not (offer) fifty cows to the (Yellow) River Power.”

¹⁰³ On *du ut des*, “I give, in order that thou shouldst give,” see Keightley, “Religious Commitment,” pp. 214–15, and n. 13.

¹⁰⁴ I rely upon the reconstruction and ordering of the charges proposed by Yan Yiping, “Jingguo sanshi nian zhuihe de yi ban da fujia” 經過三十年綴合的一版大腹甲, *Zhongguo wenzi* 中國文字 11 (1986), pp. 154–58, fig. 4. He compares the reconstructions of other scholars and supplements the *Bingbian* 117 and *Heji* 672f rubbings. Of the 50 inscription units he discerns on the plastron, I transcribe his nos. 4, 7, 8, 27–30, 32–33, 38–40, 42–46.

¹⁰⁵ Wang Hai 王亥, as he is revealed in the inscriptions, was a “Former Lord” (*xian gong* 先公, a modern term), a shadowy figure who was apparently regarded as one of the early pro-

INSCRIPTION 22G

出于河我女

“(We will) offer to the (Yellow) River Power a woman of Wo.”¹⁰⁶

INSCRIPTION 22H

酹河五十牛

“(We will perform) the *you*-cutting sacrifice to the (Yellow) River Power (with) fifty cows.”

INSCRIPTION 22I

酹河三十牛𠄎我女

“(We will perform) the *you*-cutting sacrifice to the (Yellow) River Power (with) thirty cows and take a woman of Wo.”

INSCRIPTION 22J

禱雨于上甲宰

“(We will) pray for rain to Shang Jia (with) a penned sheep.”

INSCRIPTION 22K

貞：出于上甲十牛

Divined: “(We will) offer to Shang Jia ten cows.”

INSCRIPTION 22L

貞：禱年于大甲十宰祖乙十宰

Divined: “(We will) pray for harvest to Da Jia (with) ten penned sheep, (to) Zu Yi (with) ten penned sheep.”

INSCRIPTION 22M

出于成大丁大甲大庚大戊中丁祖乙祖辛祖丁牛𠄎羊

“(We will) make offering to Cheng (= Da Yi), Da Ding, Da Jia, Da Geng, Da Wu, Zhong Ding, Zu Yi, Zu Xin, and Zu Ding (with) one cow and...(?)... a sheep.”

INSCRIPTION 22N

來辛亥燎于王亥三十牛

“On the coming *xinhai* (day 48), (we will) make burnt-offering to Wang Hai (with) thirty cows.”

genitors of the Shang elite; indeed, the Shang sometimes referred to him as 高祖王亥, “High Ancestor Wang Hai” (e.g., *Heji* 30447, 32916). His jurisdiction was remarkably extensive, ranging from the well-being of the king’s person, to rainfall, to fruitful harvests, to military campaigns (e.g., *Heji* 7352f, 32064, 10105, 378f, 6527f).

¹⁰⁶ Wo 我在 the oracle-bone inscriptions served both as a personal pronoun and as the name of a community (*Sōran* 1526). It is possible that item 22G referred to the offering of “a woman of ours.”

INSCRIPTION 22O

五十牛于王亥

“(We will offer) fifty cows to Wang Hai.”

INSCRIPTION 22P

翌辛亥出于王亥四十牛

“On the next *xinhai*, (we will) offer to Wang Hai forty cows.”

INSCRIPTION 22Q

出于王亥女

“(We will) offer to Wang Hai a woman.”¹⁰⁷

We may notice, in the first place, the ritualists’ concern with getting the right number of victims offered to the right ancestor or other Power: two sheep and two pigs, or one sheep and one pig, in the *yong*-eve ritual (inscriptions 22BC); three sheep and three pigs, or two sheep and two pigs, in the *yi*-ritual (inscriptions 22BC); fifty cows or thirty cows to the (Yellow) River Power (inscriptions 22D, E, F, H, I); a penned sheep or ten cows to Shang Jia (inscriptions 22JK); thirty, fifty, or forty cows to Wang Hai (inscriptions 22N-P), and so on.

The Shang were evidently concerned about matching, for efficacy, the numbers of victims to particular ritual recipients. In inscription 14, for example, they offered three dismembered victims to the “three Fathers,” presumably one for each; in inscription 15 they offered three cows to Father Yi, but pledged thirty dismembered victims and thirty penned sheep. The size of the pledge, in other words, was ten times the size of the offering. A similar ratio may be found in:

INSCRIPTION 23

甲子卜爭貞：禱年于日(=日)𠄎十𠄎牛𠄎百𠄎牛

Making cracks on *jiazi* (day 1), Zheng divined: “In praying for harvest to the sun, we cleave ten dappled cows and pledge one hundred dappled cows.”¹⁰⁸

It seems that this charge involved a major harvest prayer, offered to the sun (or suns) on the first day of the cycle (*jiazi*, day 1), in which ten cows were offered (one for each sun of the ten-day week?) and one hundred more were pledged (ten for each sun?). There appears to have been a link between the number of victims and the number of days (or suns) in the ten-day week.¹⁰⁹

¹⁰⁷ *Heji* 672f.

¹⁰⁸ *Heji* 10116. For a discussion of the correct transcription of this inscription (mistranscribed at Y530.2), see Keightley, “Graphs, Words, and Meanings,” pp. 512–13, 517–19.

¹⁰⁹ Cf. *Heji* 1975, which, if we read □ as 日 (Keightley, “Graphs, Words, and Meanings,”

Second, we can notice, once again, the attention to timing. Inscriptions 22N and P stipulated that forty or thirty cows were to be offered to Wang Hai on the day *xinhai*. As K. C. Chang has noted, there was a tendency – and it is only that – to worship Wang Hai, and also Nao 夔 (another Former Lord), and Yang 兕, the Mountain Power – on *xin* days, as evident in inscriptions 22N and P.¹¹⁰ I suspect that this was because the *xin* days were relatively free of ancestral cult. For the period from Da Yi (K1) to Pan Geng (K18), there was only one king (K13) and only one queen (Bi Xin 妣辛, the consort of Zu Ding, K15), whose temple-name was Xin. This means that by the time of Zu Jia (K23), when the cult schedule was regularized, the Shang ritualists would have been making no *xin*-day offerings to kings or consorts in the first four weeks of the regular dynastic cycle.¹¹¹ It is plausible, accordingly, to suppose that the Shang would have preferred *xin*-days for offering cult to Former Lords because the *xin*-days in the early part of the cycle were “vacant.”¹¹² Whatever the true reason, and there may have been several, for preferring *xin*-days, the case of Wang Hai provides one more indication that the Shang scheduled their use of ritual time parsimoniously and efficiently.

Third, the very regularity of the Shang ritual cycle, in which ancestors received cult on their name days according to an unvarying and predetermined schedule,¹¹³ may also have increased the curative powers of the ritual appeals that the Shang kings made to their ancestors. It has recently been reported that

Duke University researchers found an association between increased immune function and regular attendance at religious services.... Those who attended services at least once a week were about half as likely as non-attenders to have high blood levels of

pp. 517–24), involves the offering of ten cattle “to the sun” on a *jia*-day, *jiaxu* (day 11).

¹¹⁰ Zhang Guangzhi 張光直, “Tan Wang Hai yu Yi Yin de jiri bing zailun Yin-Shang wang-zhi” 談王亥與伊尹的祭日並再論殷商王制, *Zhongyang yanjiuyuan minzuxue yanjiusuo jikan* 中央研究院民族學研究所集刊 35 (1973), pp. 114–15; idem, *Zhongguo qingtongqi shidai* 中國青銅器時代 (Hong Kong: Zhongwen daxue, 1982), pp. 109–10; idem (Chang Kwang-chih), “*T'ien Kan: A Key to the History of the Shang*,” in David T. Roy and Tsuen-hsuei Tsien, eds., *Ancient China: Studies in Early Civilization* (Hong Kong: Chinese University Press, 1978), pp. 32–34.

¹¹¹ For a table that introduces the Shang sacrificial schedule, see S588 or Y1474. For a detailed analysis, see Chang Yuzhi 常玉芝, *Shangdai zhouji zhidu* 商代週祭制度 (N.p.: Zhongguo shehui kexueyuan, 1987).

¹¹² It should also be noted that Wang Hai, although sometimes referred to as “High Ancestor,” was never given a Xin temple-name, presumably to distinguish him in some way from the dynastic ancestors on the main line of descent.

¹¹³ For a brief introduction to the five-ritual cycle, see Keightley, “The Shang,” pp. 260–61; and “Making of the Ancestors.”

interleukin-6, a protein that regulates immune and inflammatory responses in the body.¹¹⁴

Evidently, the Shang found satisfaction in the thought that, after death, they would be remembered on a regular basis. The ancestors so remembered might have been impersonalized,¹¹⁵ but the regular attendance that their cult required might well have had therapeutic benefit for the living.

Finally, it may be noted that the number of days involved was frequently specified in divinations when the results were spread over time. For example, inscription 2: “When it came to the fifth day, *ding-you*,...”; inscription 3: “On the eighth day, *gengxu*,...”; inscription 4: “On the ninth day, *xinwei*,...”; inscriptions 18AB: “(After) thirty-one days, on *jiayin*,...”; inscription 19: “On the 17[5]th day, [*wu*]yin,....” Whether the size of the time-intervals was important, or whether the diviners simply added the day counts as a “fail-safe” device to ensure that the *ganzhi* dates were also correct, is not known. It is once again evident, however, that the passage of divinatory time was important, and that it was important to record it with precision.

DIVINATORY METAPHYSICS

As I have written earlier, “one of the most significant features of many divinations of the Wu Ding period was the complementary, antipodal, balanced nature of the paired charges” (as in inscriptions 8CD, EF, GH, IJ, KL, 10BC, DE, FG, RS, 18AB, 20AB, CD). The engravers frequently balanced such charges by placing them in corresponding positions to the right and left of the plastron’s central spine; such charges, moreover, were sometimes balanced calligraphically, with the characters on one side of the plastron being engraved as virtual mirror images of the characters on the other side. The pyromantic cracks, whose shape and direction was determined by the hollows that the diviners had previously bored into the back of the bone, also ran against each other in symmetrical opposition.

A large majority of all divination topics in the reign of Wu Ding was likely to be subjected to this symmetrical, positive-negative, complementary bifurcation. Divinations about disaster, distress, sickness, childbearing, rain and shine, floods, curses by ancestors or nature powers, harvest, divine protection and assistance, administrative orders, rituals and sacrifices, success in hunting,

¹¹⁴ *Harvard Health Letter* (1998), p. 1.

¹¹⁵ Keightley, “Making of the Ancestors.”

military strategy, capture of prisoners, urban construction, tours of inspection, sorties, trips, tribute payments, and so on, were all, on occasion, paired in this way....

...the Shang diviners, and presumably the elites who employed them,¹¹⁶ saw the world as a series of balanced dualisms, in which the auspicious and inauspicious, good and bad, harvest and dearth, victory and defeat, flood and drought, were seen as inextricably entwined possibilities; the solutions which they proposed in their charge pairs were contrary, but, because they were both potentially true, they were not contradictory. The balanced cracks and charges dramatized, not the battle of good and evil, as they might have done in other cultures, but the essential symbiosis of good and bad fortune. They symbolized a metaphysical ambiguity that was presumably felt to be both desirable and true....

To the Shang of Wu Ding’s time there was less emphasis on polar opposites, one of which would triumph over the other. There was more concern, I would suggest, with momentary balance. Divination might reveal that the balance inclined to the positive or negative, but the balance was transitory and precarious, and the possibility, recorded antipodally on the other half of the shell, that the balance would swing back the other way, was a reminder, carved into the record, of the changeable and inscrutable nature of reality and of man’s rather humble role in attempting to understand or control it.¹¹⁷

Divination, as it was practiced under Wu Ding, involved a science of positive and negative propositions, of accommodation, of sympathetic and wishful classification, and of rather limited experimentation within those parameters.

The binary divinations about health and other issues during the reign of Wu Ding may be correlated with other features of Shang science. As the tongue-in-cheek critics of Microspeak – “a slangy company jargon made up of dozens of words and phrases commonly used at Microsoft” – have noted, the term, “Binary problem” refers to “a method

¹¹⁶ For the view that the logic and assumptions of Shang divination were likely to resemble those current in other aspects of life, see Keightley, “Late Shang Divination,” p. 12, n. 7. Consider, too, the judgment of J. J. Finkelstein, “Mesopotamian Historiography,” *Proceedings of the American Philosophical Society* 107.6 (1963), p. 463, that “the Mesopotamian form of learning known as ‘divination’ was rooted in, and is most characteristic of, the fundamental cognitive mode of the Mesopotamian intellect.” A similar judgment, broad though it is, could, I believe, be reached about Shang divination.

¹¹⁷ Keightley, “Shang Divination and Metaphysics,” p. 374. Here as elsewhere, I convert all romanizations in quoted passages to pinyin.

of paring down a complex issue to a two-possible-solutions scenario (yes or no, 1 or 0).” It has been

described by a resident Microsoft philosopher as “classic MS reductivism” and “clearly an economical way of thinking since it eliminates all need to consider the vast gray area that occupies the psychic space of most issues and problems.”¹¹⁸

Both the theology of Shang medical understanding and the binary formulation of the divination charges would have encouraged a tendency to stress theory over observation, just as the Shang construction of their ancestors stressed impersonal order over individual identity.¹¹⁹

The nature of the Shang divinatory impulse is also of significance. For the Greeks at Delphi, the oracle’s words were ironic, quirky, deceptive, inspired; they required probing, unpacking, explicating.¹²⁰ Greek divination, in fact, may be described as “epistemologically pessimistic.”¹²¹ The Shang divination charges, by contrast,

were couched in terms that left little freedom for spiritual inspiration or invention. Under Wu Ding the complementary charge pairs generally offered only two options: “It will rain/it might not rain,” “We will receive assistance/we might not receive assistance,” etc. By the late periods, a single option was the norm: “It will rain,” “We will receive assistance.” And to such restricted divinations, the cracks could give only three responses – auspicious, inauspicious, or neutral.... Some gradations were provided for ... but generally the world was conceived in sharply delineated alternatives, which either prevailed or did not. There was no room for subtle interpretations, paradoxical responses, or deceptive meanings concealed in obscure prognostications.¹²²

Robin Horton has remarked on the way that “explicit definition of a limited number of permissible responses” reduces uncertainties and

¹¹⁸ Steven Greenhouse, “Braindump on the Blue Badge: A Guide to Microspeak,” *New York Times* (August 13, 1998), p. D9.

¹¹⁹ Keightley, “Making of the Ancestors.”

¹²⁰ Keightley, “Late Shang Divination,” pp. 17, 29, n. 11.

¹²¹ For this term and its application to early Chinese thinking, see Thomas A. Metzger, “Some Ancient Roots of Modern Chinese Thought: This-worldliness, Epistemological Optimism, Doctrinality, and the Emergence of Reflexivity in the Eastern Chou,” *EC* 11–12 (1985–87), pp. 61–117; David N. Keightley, “Epistemology in Cultural Context: Disguise and Deception in Early China and Early Greece,” in Steven Shankman and Stephen Durrant, eds., *Early China, Ancient Greece: Thinking Through Comparisons* (Albany: State University of New York Press, 2001), pp. 119–53.

¹²² The quoted passages are taken, with some adjustments, from Keightley, “Late Shang Divination,” p. 17.

dangers of communication, especially when a large status difference distinguishes the participants.¹²³ He finds such stereotyping typical of religious contexts and opposed to the flexibility of nonreligious ones. The forms of Shang divination, reflecting perhaps the keenly felt status differences between man and the Powers, as well as those between the king and his subordinates, appear to have found such stereotyping reassuring.¹²⁴

To adapt the joke that “Atheism is a non-prophet organization,” one could note that Shang ancestor worship, like the Shang patrimonial state, was a non-prophet institution; the Shang elites wished to get along with their ancestors, they did not wish to challenge them or the hierarchy of authority they represented. Shang divination, in fact, was epistemologically optimistic; it accepted the patterns in the cracks, the patterns devised by man and submitted to the ancestors, as true and efficacious. Can one suggest that epistemological pessimism, with its skeptical questioning of reality and the status quo, encourages classical science, while epistemological optimism, with its uncritical acceptance of a patterned reality – and, in the Shang case – a desire to accord with that reality – encourages pre-classical, archaic science? If so, the conclusion might be not that the Shang and Zhou were less scientific, say, than the Greeks, but that the Greek dispositions provided the roots for more skeptical and probing visions of the world and its mechanisms.¹²⁵

BRONZE CASTING

Late Shang Bronze casting involved a remarkably skillful use of ceramic, metallurgical, and high-heat technology whose roots, as in the case of divination by bone and shell, lay in the Neolithic. The bronze-casters’ primary function was the creation of vessels for use in the ancestral cult. The design of those ritual vessels involved impressive attention to symmetrical placement and an almost “dictatorial” order of design.¹²⁶ And the casting of the vessels required an impressive ability to recruit and coordinate the labor of skilled technicians

¹²³ Horton, “A Definition of Religion and Its Uses,” *Journal of the Royal Anthropological Institute* 90.2 (1960), pp. 208–9.

¹²⁴ The stereotyping is further explored in Keightley, “Making of the Ancestors.”

¹²⁵ Lloyd, *Ambitions of Curiosity*, explores these comparative issues in detail.

¹²⁶ For an introduction to the decor on Shang bronzes and to Shang foundry methods, see, e.g., Robert W. Bagley, *Shang Ritual Bronzes in the Arthur M. Sackler Collections* (Washington, D.C.: The Arthur M. Sackler Foundation and Museum; Cambridge, Mass.: Harvard U.P., 1987), pp. 30–43. I first heard James Cahill suggest the word “dictatorial” in his undergraduate lectures years ago.

on a large scale.¹²⁷ Much of the cult in which these vessels were used was practiced in conjunction with divinations (which, as the diviner created his cracks, also required the skillful use of heat technology) that also involved the participation and approval of the ancestors (as in inscriptions 1, 8AB, 10RS, 11, 12, 13A). The world of the diviners and the world of the bronze casters would have shared strategic cosmological and epistemological assumptions, revealed in the aesthetics and mechanisms of their crafts.

Robert Poor has proposed that the Shang bronze casters paid great attention to “the identity of proportional details.” Thus, with regard to three *gu* 觚 beakers excavated from M1400 at Xibeigang 西北岡, the royal cemetery,

a formula was used for shaping these vessels, a formula that guaranteed that the proportions of all the *gu* in this suite were approximately the same regardless of the differences in their size. The formulation depends on the use of a module. In this case it is the diameter of the waist that provides the key measurement.... it appears that all the vessels in the Fu Hao I group are approx. 15 to 16 radii in height.

Poor has also proposed that

The use of a repetitive guide of any kind (mechanical or otherwise) does more than save labor. It also exerts a subtle, but nonetheless profound, effect on the form of the objects produced in this way. In a very real sense, form follows process.... So, in the final analysis, it is the sense of an anonymous “period style” and not the eccentric notion of personal or individual style that characterizes the history of the art of this dynasty.¹²⁸

These comments, I believe, might also be applied to the way in which the Shang impersonalized and regularized their ancestors in the repetitive ritual cycle that had come to dominate their offerings by the end of the dynasty.¹²⁹

The Shang bronze casters also appear to have worked with precise units of measurement. “Every aspect of the shape of” a bronze *gu*,

¹²⁷ Ursula Martius Franklin, “On Bronze and Other Metals in Early China,” in David N. Keightley, ed., *The Origins of Chinese Civilization* (Berkeley: U. of California P., 1983), pp. 279–96; idem, “The Beginnings of Metallurgy in China: A Comparative Approach,” in George Kuwayama, ed., *The Great Bronze Age of China: A Symposium* (Los Angeles: Los Angeles County Museum of Art; distributed by U. of Washington P., 1983), pp. 100–23.

¹²⁸ Robert J. Poor, “The Master of the ‘Metropolis-Emblem’ Ku,” *Archives of Asian Art* 41 (1988), pp. 74, 77.

¹²⁹ Keightley, “Making of the Ancestors.”

for example, according to Poor, “was planned according to a system of proportions based on a design module equivalent to a 16 millimeter square,” and he concludes that “the Smart Museum bronzes were all designed around a module that is between 15 or 16 mm in modern measure.” He rejects, however, the idea that this was “the neolithic or Shang dynasty inch,” finding “another, less obvious number encoded in the design of these vessels,” which leads him to propose that the Neolithic and Shang “inch” was ca. 23.5 mm long.¹³⁰ Such attention to mensuration does not, of itself, qualify as science, but it does testify to both a concern with standard units of mensuration and to the sophistication of Shang bronze-casting technology.

Robert Bagley’s account of the decor and technology of Shang bronze casting also bears on these issues. I will here simply provide a sample of his judgments about the role of the flanges. He writes that

...the overwhelming trend after the introduction of the decorated model was not toward fewer divisions but toward more divisions, more conspicuously drawn. ... This symmetrical and relentlessly subdivided design reflects not a mold-assembly but an aesthetic. ... Near the end of the Erligang phase a newly invented element, the flange, came into use as a means of strengthening the subdivisions of these schemes, and on Anyang bronzes the compartmented character of the decoration was announced more forcibly than ever before.

... Flanges were added not to disguise mold marks but to stress the vertical divisions in ornamental friezes.

... the rise of the *taotie* and dragon can be viewed... as the emergence of a system of rigidly compartmented designs.... lifted out of its compositional framework the *taotie* is trivialized....¹³¹

Following the insights of Poor and Bagley, I would propose that, as with the divination charges, the rigidly compartmentalized design of the bronze motifs permitted no personal inspiration.¹³² Whether or

¹³⁰ Poor, “Sectionalism at Work: Construction and Decoration Systems in Ancient Chinese Ritual Vessels,” *The Smart Museum of Art Bulletin* (1990–92), pp. 4, 15. David N. Keightley, “A Measure of Man in Early China: In Search of the Neolithic Inch,” *Chinese Science* 12 (1994–95), pp. 16–38, also argues for a “Neolithic inch” that was ca. 23.5 mm long. Indeed, I would suggest that the “Neolithic inch” that may be discerned in the animal-mask registers of the jade *cong* 琮 tubes of the Liangzhu Neolithic may have been used to represent the generational hierarchy of the ancestors. There may have been some religious impulse to portraying the generations – if that is what the registers on the *cong* represented – as being of equal size, as occupying equal space. Certainly, in the Period V ritual cycle they were given equal “ritual space”; Keightley, “Making of the Ancestors.”

¹³¹ The three passages are, respectively, taken from Bagley, *Shang Ritual Bronzes*, pp. 26, 28, 30.

¹³² As Poor, “Sectionalism at Work,” p. 6, has written of the designs on a Shang *ding* 鼎:

not the characteristic decor of the bronzes – with their glaring frontal animal masks, symmetrically formed about a central axis – was imposed by technological constraints,¹³³ there is no doubt that the aesthetic and religious impulses that led to, and were expressed in, these formidably imposing designs, found meaning and pleasure in the same kind of structured vision of reality that we have discerned in the metaphysical assumptions of the Shang diviners. As I have also noted, “The ritual compartmentalization, standardization and impersonalization of the Shang ancestors, and the lack of concern with their naturalistic representation, are entirely congruent with, and were presumably deeply implicated in, the genesis of the modular imagination that Ledderose describes.”¹³⁴

Both the diviners and the bronze-casters took pleasure in the symmetrical placement about a central axis of inscriptions – for the diviners – and of decor – for the bronze-casters. Both took pleasure in the “boundedness” of their topics and designs. The same kind of concern that assigned particular jurisdictions to ancestors was also present in the isolating motifs on the ritual bronzes,¹³⁵ on which, as Robert Poor, writing of a Shang *gu* has noted, “All of the decorative motifs ... are confined to distinct fields no figure ever spreads beyond its borders.”¹³⁶ Just as the generations of the Shang royal lineage, whose members, as ancestors, were impersonalized and abstracted representations of their living selves, were each assigned their place in the ritual schedule,¹³⁷ so were the abstract bronze motifs added cumulatively, one to another.¹³⁸ Both the religion and the technology depended for their effect on the creation and manipulation of relatively standardized components: ancestral personae, clay models, clay molds.

The piece-mold bronze casting process, finally, depended upon the construction and emulation of ceramic models, so that the bronze casters, like the diviners, had conceived and established the form of the final product, ritual vessel or divination charge, well in advance of its eventual incarnation in bronze or bone. The technology did not

“We might think that such a dramatic design came spontaneously from the mind of the artist. In reality, it was produced according to some exact laws of composition which governed the disposition of the decorative patterns and their relationship to the shape of the vessel itself.”

¹³³ For a summary of the scholarly debate about the function and meaning of the animal-mask designs on the ritual bronzes, see Ladislav Kesner, “The *Taotie* Reconsidered: Meanings and Functions of Shang Theriomorphic Imagery,” *Artibus Asiae* 51.1–2 (1991), pp. 29–53.

¹³⁴ Keightley, “Making of the Ancestors”; see Lothar Ledderose, *Ten Thousand Things: Module and Mass Production in Chinese Art* (Princeton: Princeton U.P., 2000), pp. 2, 5, 7.

¹³⁵ For ancestral jurisdictions, see Keightley, “Religious Commitment,” pp. 218–19.

¹³⁶ Poor, “Sectionalism at Work,” p. 9.

¹³⁷ See, e.g., item 22M and n. 111, above.

¹³⁸ Poor, “Sectionalism at Work,” p. 9.

encourage individual experiment or invention. The Shang designed their ritual bronzes, as they divined their world, by employing a limited series of formulas that they found aesthetically and metaphysically satisfying.¹³⁹ The technologies that the Shang brought to bear both in their divinatory modes, in their treatment of illness, and in their casting of bronze shared many assumptions that may be viewed as “scientific.” Given their inability to shape the mechanisms of the human body, however, the results, in the case of Shang medicine, were bound to be less effective than they were in the case of Shang metallurgy. But their medical prescriptions may, in their explanatory role, be judged to have worked successfully, providing a sense of sanity and comfort in the face of disease, and even, on occasion, doing some good.

CONCLUSIONS

Shang science – involving, to return to Sivin’s definition, “the observation, identification, description, experimental investigation, and theoretical explanation of phenomena” – as we see it in Shang divinatory inscriptions and in Shang bronze casting, where “abstraction,” that is, the ability to generalize about procedures, and “objectivity,” that is, respect for the qualities of the ceramic molds and the molten metal, must certainly have played a role – involved discerning, imposing, and acting in accordance with structures that both shaped, as they were shaped by, social patterns that had been given powerful religious form. The roots of those religious and social forms lay far back in the Chinese Neolithic. Ian Hodder’s discussion of the Neolithic situation in Northwest Europe may also be applied to the early Chinese case:

Daily settlement practices did not form the basis of long-term social structures. The latter were, however, set up in the practices of death and the veneration of ancestors. It was the tomb, especially as it began to be used over many generations, which could become the “home” of dispersed local units. The tomb created continuity and stability in the face of death and dispersal of community members.¹⁴⁰

¹³⁹ Cf. Bagley, *Shang Ritual Bronzes*, p. 45: The short survey of techniques given... exhausts the technical repertoire of Shang founders. Measured against the array of techniques mobilized in the West..., it is remarkably limited. That this narrow range of methods sufficed the Shang metal-worker is a reflection of the narrow range of objects he sought to produce.... Shang metalworking evolved under constraints that were, by the standards of the rest of the world, extraordinarily rigid.” But as he also notes, “Technical constraints do not stifle, the imagination; quite the contrary.”

¹⁴⁰ Ian Hodder, “Architecture and Meaning: The Example of Neolithic Houses and Tombs,” in Michael Parker Pearson and Colin Richards, eds., *Architecture and Order: Approaches to So-*

The assumptions of Shang ancestor worship, involving the impersonalized dead, hierarchical jurisdictions, ritual schedules, sacrificial negotiation, a symbiotic balance between positive and negative forces, and a theology constructed upon the jurisdictional hierarchy of senior-junior generations, conferred high value on such epistemic forms. Ancestor worship, together with its attendant divinatory mechanisms, may be said to have provided a form of management, in the sense that Peter Drucker has defined management: “an integrated discipline of human values and conduct, of social order and intellectual inquiry....”¹⁴¹ This was a culture, presumably like most others, in which social values shaped science and technology more than science and technology shaped social values. The practices that expressed the social values, in fact, served as the prime technology.

The Shang ancestors, to adapt Einstein’s formula, “did not play jokes.” But the rules according to which they did play were those of social science, not hard science. The achievements of Shang science and technology were founded less on improvising a new version of reality that emphasized precision, quantification, and mathematics,¹⁴² more on providing social forms and technological products that incarnated and reinforced the values of the ancestors, their cult, and those who depended upon them. When the Shang ritualists visualized the world, they did so primarily, not in terms of numbers that had value in their own right, but in terms of how those numbers would appeal to, and be meaningful to, their ancestors (see, for example, the discussion of inscriptions 22A-Q, above).

cial Space (London: Routledge, 1994), p. 77. He introduces (p. 80) the concept of the domus, “a set of ideas and practices which focus on the house. The very fabric and practices of the house created Neolithic society because they involved bonds, dependencies and boundaries between people. The domestic social unit was constructed in the practices of the house.” See too Richard Bradley, *The Significance of Monuments: On the Shaping of Human Experience in Neolithic and Bronze Age Europe* (London: Routledge, 1998), p. 51, who addresses, for western Europe, the way in which “The presence of the ancestors in a particular place helps to establish a community’s claim to agricultural land, while the practicalities of farming a particular landscape over a lengthy period involve a new awareness of time.” For the Chinese Neolithic, see, e.g. Liu Li, “Mortuary Ritual and Social Hierarchy in the Longshan Culture,” *EC* 21 (1996), pp. 1–46, who argues in her abstract (p. v) that social stratification evident in kinship-based Longshan communities “was ideologically legitimized by ritual activities that emphasized ancestor worship.” Neolithic and Shang domestic practice and ancestral cult would have exerted a powerful influence on both the organization and conception of Shang reality.

¹⁴¹ Michael Lewis (*New York Times Book Review* [January 11, 1998], p. 5), quoting Jack Beatty, *The World According to Peter Drucker* (New York: The Free Press, 1998).

¹⁴² These are the features that, Alfred W. Crosby, *The Measure of Reality: Quantification and Western Society, 1250–1600* (Cambridge: Cambridge U.P., 1997), associates with Europe’s scientific and technological revolution.

The Shang ritualists treated time in a similar way. Clifford Geertz’s remark about the Balinese calendar may in fact throw further light on the Shang situation: “The Balinese calendar...cuts time up into bounded units not in order to count and total them but to describe and characterize them, to formulate their differential social, intellectual, and religious significance”; the Balinese “don’t tell you what time it is; they tell you what kind of time it is.”¹⁴³ This was also true of Shang divination; where the measurement of time was concerned, religious values and social goals dominated technological ones. The days were important and were recorded because they were identified with the ancestors and with good and bad fortune.¹⁴⁴

There is nothing unique in the arguments I have made above. As Paula Findlen has remarked,

The historiography of sixteenth- and seventeenth-century science has, in recent years, produced a spate of works attacking the idea that science proper is a wholly rational process that emerged separately from and in opposition to late Renaissance natural philosophy. The corrective to the positivistic approach has set up as an alternative structure an occult tradition of science that coexisted with and flourished in the post-Copernican and Newtonian world.... “In whatever discipline – astrology, alchemy, numerology, or magic – nature is significant not in itself but as a system of signs pointing to another system of mental categories.”¹⁴⁵

As she continues, “Rather than assuming that the traditional polarities set up within the study of science are constants, I wish to shade the meanings of ‘rational’ and ‘irrational,’ investigating the gradations of these categories.”¹⁴⁶ If, as David Noble has recently argued, “The technological enterprise” has always been “an essentially religious endeavor,”¹⁴⁷ then it should prove fruitful to approach the technology

¹⁴³ Clifford Geertz, *Person, Time, and Conduct in Bali: An Essay in Cultural Analysis*, Cultural Report Series 14 (New Haven: Southeast Asia Studies, Yale University, 1966), pp. 45–47; quoted by Robert Wessing, “Life in a Cosmic Village in West Java,” in Edward Bruner and Judith Becker, eds., *Art, Ritual and Society in Indonesia* (Athens, Ohio: Center for International Studies, Ohio University, 1979), pp. 111–12. On Shang conceptions of time, see Keightley, *Ancestral Landscape*, pp. 17–53.

¹⁴⁴ Ji [Keightley], “Zhongguo gudaide jiri”; and Keightley, *Ancestral Landscape*, pp. 29–35.

¹⁴⁵ Paula Findlen, “Jokes of Nature and Jokes of Knowledge: The Playfulness of Scientific Discourse in Early Modern Europe,” *Renaissance Quarterly* 43.2 (1990), p. 295; the passage in quotation marks is taken from Brian Vickers, ed., *Occult and Scientific Mentalities in the Renaissance* (New York: Cambridge U.P., 1984), p. 9.

¹⁴⁶ Findlen, “Jokes of Nature,” p. 296.

¹⁴⁷ David F. Noble, *The Religion of Technology: The Divinity of Man and the Spirit of Invention* (New York: Knopf, 1987), pp. 4–5.

and science of the Shang, like that of traditional societies in general, in this same holistic spirit.¹⁴⁸

Finally, it is worth considering some of the socio-biological impulses that may have underlain both Shang theology and Shang medical and technological practice. As Nicholas Wade has written,

The logic of the evolutionary biologists is hard to fault. Animals are not designed to live forever, they say, because there would be no point. They quickly get killed by predators or accidents, which is why so few elderly animals are seen in nature. Better to channel resources into breeding prolifically and early in life. It is not that evolution, meaning the force of natural selection, cannot design organisms of immense longevity; the bristlecone pine lives for 5,000 years. But for most creatures, the necessary trade-off between fertility and longevity yields a much briefer life span. The Garden of Eden account said it first: sex and death are tightly linked.

...among the many genes that have more than one effect on the body, those that are good for youth and bad for age become incorporated into the population because their holders have many descendants. ...¹⁴⁹

This passage leads to several reflections. First, I would suggest that ancestor worship attempts to avoid the trade-off between fertility and longevity; one has many descendants (fertility), but one continues to exist (longevity) – at least in royal lineages – as a member of the ancestral hierarchy created and maintained by those numerous descendants. Ancestor worship, with its respect for the aged, *xiao* 孝, attempts to transcend the biological or evolutionary imperative, while continuing to stress many descendants. Second, I would note that there is no myth in early Chinese texts equivalent to that of the Garden of Eden; there is, in early China, no myth about the creation of death, no Gilgamesh who rails against his dying. Death, evidently, did not represent the existential challenge that it did in some other Classical cultures.¹⁵⁰ An-

¹⁴⁸ See too Rochberg, “Babylonian Omen Texts,” p. 560: “For historians in the current post-positivistic climate, science has ceased to be the exclusively logical and empirical enquiry it once was, clearly and cleanly separable from theology, metaphysics, and other speculative or ‘mythic’ forms of thought”; she provides (n. 8) some samples of “what is now an enormous literature on this topic.”

¹⁴⁹ Nicholas Wade, “Can Life Span Be Extended? Biologists Offer Some Hope,” *New York Times* (January 13, 1998), p. B11.

¹⁵⁰ Death in China “was evidently reserved for the ritual texts..., which contain remarkably detailed recipes for dealing – not so much with a particular death but with the dead in general. We are told much about how to mourn, little about what it was like to mourn. The ritualists, like the artists, were ordering, controlling, and impersonalizing experience, rather than describ-

cestor worship thus served to defuse the challenge that mortality poses for mankind; and in so doing it may well have weakened the impulse to dominate and improve upon the world, whether biological or technological. One turned, in the realm of medicine, to the ancestors for assistance.¹⁵¹ And the high technology developed by the Shang bronze-casters was intended precisely to facilitate that turn. The motto would not have been, “Heaven helps those who help themselves,” but “The ancestors help those who help the ancestors.” And helping the ancestors would have discouraged innovation, for respect for the ancestors would have involved doing things in the old way that the ancestors had validated and would now approve.¹⁵²

The oracle-bone inscriptions provide only a narrow, if deep, entry into the mentality of the Late Shang elites. For all their limitations, however, those inscriptions do permit us to map a constellation of strategic cultural traits that make coherent sense, in terms of the inscriptional evidence itself, in terms of the archaeological evidence for the Neolithic and Bronze Ages, and in terms of the cultural legacy that the Shang left behind. The “science” of the ancestors was a science of humans and ex-humans, not a science of things. It was a science that was concerned primarily with why things occur, not how they occur. It was Shang science, not modern, or even classical, science. It was science at the service of the Shang elites. And therein lay its great strength.

The Shang, as I have presented them, do not seem particularly strange. But that, I think, is a function of the inscriptional sources they left behind. As I have written earlier, “the inscriptions provide a flat

ing or dramatizing it. Death in Zhou China was not represented as a cathartic experience. It was a subject for ritual, not a subject for art”; (David N. Keightley “Clean Hands and Shining Helmets: Heroic Action in Early Chinese and Greek Culture,” in Tobin Siebers, ed., *Religion and the Authority of the Past* (Ann Arbor: U. of Michigan P., 1993), pp. 31–32.

¹⁵¹ I am well aware of the strong Chinese interest, in later ages, in doctrines of immortality; I would suggest, however, that those appeared precisely at a time when the strength of the lineage and its ancestors was much reduced.

¹⁵² I do not want, however, to overstate the conservatism of early Chinese ancestor worship and the culture it both reflected and helped create. There is, for example, evidence of considerable development in Shang divination and its associated beliefs during the ca. 150-year period from the reign of Wu Ding down to the end of the dynasty (see, e.g., Keightley, “Shang Divination and Metaphysics,” pp. 378–83); this evolution, in fact, needs to be considered in more detail for the light it might throw on the development of Shang “science.” And Jessica Rawson, “Western Zhou Archaeology,” in Michael Loewe and Edward L. Shaughnessy, eds., *The Cambridge History of Ancient China: From the Origins of Civilization to 221 B.C.* (Cambridge: Cambridge U.P., 1999), pp. 433–40; has argued for the existence of a major ritual reform during the latter part of the Western Zhou. Nevertheless, the respect shown to the elders of Shang and Zhou, whether alive or dead, cannot but have influenced the pace and channeled the direction of social and intellectual change. (On the ritual reform, see also Edward L. Shaughnessy, “Western Zhou History,” in *ibid.*, pp. 331–38.)

and abbreviated view” of the Shang, “telling us more of the notes of Shang cult than of the music of Shang belief.”¹⁵³ The actual experience of Shang “science” would have appeared to us – though not, of course, to the Shang – far less rational than I have presented it here. The cries of the animal and human victims, the body parts, the decapitated heads, the blood streaming down, the startling things sick patients might have had to eat and do, the horrible uncertainties and dangers of the environment, the use of magic and spells, the awe and fear with which the ancestors were regarded – all these “realities” need to be remembered as we scan the divinatory record reproduced in modern rubbings and concordances.

Whether we think in terms of “soft” science or not, should we then refer to these Shang medical practitioners, these “witch doctors” – there, I’ve said it – as scientists? And I continue to think the answer, for all the distance that separates our science from theirs, is “Yes.” For “witch doctor” is immediately associated – at least in the minds of those of us who grew up with Hollywood movies of the 1940s – with mumbo jumbo. And the Shang were emphatically not engaging in mumbo jumbo – “unintelligible or incomprehensible language; language or ritualistic activity intended to confuse” (to quote the *American Heritage Dictionary*). Science and magic, science and the occult, as Paula Findlen and many others have demonstrated for the West, were also closely linked for the Shang. So, despite all the blood and magic, let me propose, in closing, that the Shang practitioners were craftsmen in the service of their science, craftsmen of order – in the realms of divination, theology, medicine, and bronze-casting. And by “craftsman,” to cite the dictionary, I mean practitioners who have the ability “to make or construct (something) in a manner suggesting great care or ingenuity.” The Shang were craftsmen of good, ancestral order. And the science that justified their craft, the cosmological and theological explanations that provided their practice with meaning and coherence, was indeed, the science of the ancestors.

¹⁵³ Keightley, “Religious Commitment,” p. 212.

LIST OF ABBREVIATIONS

- Bingbian* Zhang Bingquan 張秉權, *Xiaotun dierben: Yinxi wenzi bingbian*
小屯第二本, 殷虛文字丙編
- Heji* Guo Moruo 郭沫若, ed., Hu Houxuan 胡厚宣, ed.-in-chief, *Jiaguwen heji* 甲骨文合集
- S Shima Kunio 島邦男, *Inkyo bokuji sōrui* 殷墟卜辭綜類
- Sōran* Matsumaru Michio 宋凡道雄 and Takashima Kenichi 高嶋謙一,
Kōkotsu moji jishaku sōran 甲骨文字字釋綜覽
- Tunnan* Zhongguo shehui kexueyuan kaogu yanjiusuo 中國社會科學院
考古研究所, *Xiaotun nandi jiagu* 小屯南地甲骨
- Y Yao Xiaosui 姚孝遂 and Xiao Ding 肖丁, eds., *Yinxi jiagu keci leizuan* 殷墟甲骨刻辭類纂
- Yibian* Dong Zuobin 董作賓, *Xiaotun dierben: Yinxi wenzi, yibian* 小屯
第二本, 殷虛文字乙編
- Zhuihe* Guo Ruoyu 郭若愚, Zeng Yigong 曾毅公, Li Xueqin 李學勤,
Yinxi wenzi zhuihe 殷虛文字綴合