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THE MAGIC SQUARE OF THREE IN OLD CHINESE PHILOSOPHY AND RELIGION

The Old Chinese philosophers and religious thinkers, in spite of their traditional reverence for the written word, often left ideas unsaid, or only indirectly expressed—either because they and their fellow scholars took them for granted or because the fuller exposition formed part of the esoteric learning that was orally transmitted from teacher to disciple. Some of the key ideas that they did not explicitly set down were expressed in various symbols; but, again, they seldom passed on the meanings of these in books, probably for similar reasons.[1] However, an important symbol can sometimes be deciphered by a process of patient analysis, with constant reference to the contemporary books and surviving traditions; and, when this is successful, the recovered meanings not only can often serve to supplement the literary texts of that time but may also uncover forgotten traditions, thus giving us new knowledge of the old ideas and beliefs.[2] An especially fine example

[1] For an attempt to reconstruct some of the chief symbols in Old China and their basic meanings see S. Cammann, "Types of Symbols in Chinese Art," in *Studies in Chinese Thought*, ed. A. F. Wright (American Anthropological Association Memoir, No. 7 [Chicago, 1953], pp. 195–231).

[2] The value of the study of specific symbols for the History of Religions is discussed by Mircea Eliade, in "Methodological Remarks on the Study of Religious Symbolism," *The History of Religions: Essays in Methodology* (Chicago, 1959), pp. 86–107.

of how well a good symbol can reflect the principal ideas of its time, can convey several meanings simultaneously, and can even inspire new ways of thinking, is provided by a simple diagram from Old China, commonly called the *Lo Shu*.

The world of Chinese scholarship, for more than a thousand years, has known the *Lo Shu* as this simple pattern composed of black and white circles or dots, arranged in nine groups containing one to nine units each. Legend says that this was passed down from remote antiquity. It is supposed to have been first revealed on the shell of a

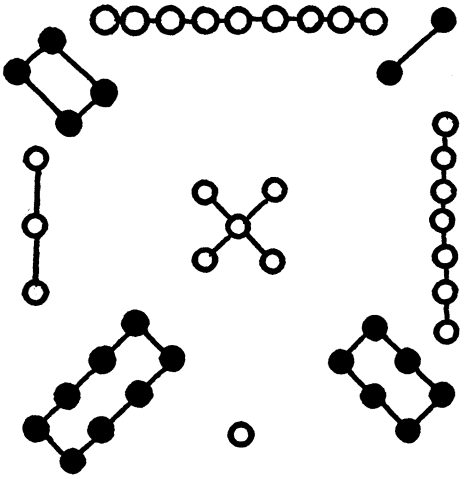

FIG. 1.—The traditional form of the *Lo Shu*

sacred turtle which appeared to the mythical King Yü from the waters of the Lo River in the twenty-third century B.C., at the time when this revered culture hero was striving to tame the floods which ravaged Ancient China.[3] However, Sinologues now quite generally recognize that the legend, including its date, is a rather late fabrication.[4] From

[3] References to this legend in English are given by James Legge, *Chinese Classics*, III, Part II (Hong Kong, 1865), 321, nn.; and *ibid.*, *The Sacred Books of China*, Part II, *Yi King* (*Sacred Books of the East*, XVI [Oxford, 1882], 17–18). The turtle episode is also associated with Huang Ti, the Yellow Emperor, in some Taoist writings.

[4] While the exaggerated claims regarding the antiquity of the *Lo Shu* have been accepted and repeated by many Western writers, some modern scholars have gone to the opposite extreme and have expressed doubt that the Chinese had the *Lo Shu* plan at all before its public appearance in dotted form in the tenth century. Joseph Needham, in his monumental work (*Science and Civilization in China*, III [Cambridge, 1959], 54–62), attempted to approach the subject with more objectivity; but he made his own share of errors to confuse the issues further, as pointed out in Cammann, "Evolution of Magic Squares in China," *Journal of the American Oriental Society*, LXXX (1960), 116–24.

this quasi-historical tale, the diagram came to be called the *Lo Shu*, meaning "Lo River Writing" or "Document of the Lo River," or sometimes simply the "Turtle Writing" (*Kuei Shu*). It was even quite frequently referred to as the "River Plan" (*Ho T'u*), although this particular term was generally applied to a related but different diagram, and eventually was used exclusively for the latter.[5] The *Lo Shu* scheme was also described as "The Celestial Numbers of the Nine Halls," or simply "Nine Halls" (*Chiu Kung*), for reasons that will be explained later.[6]

Actually, the *Lo Shu* diagram made its public appearance, in this stylized dotted form, at a very late date. This was during the tenth century A.D., after it had already died as a symbol and most of its meanings had been forgotten. Its real significance begins to emerge only when we replace the dot formations by the equivalent numbers: the nine white dots at the top by 9, the five center ones by 5, etc. Then we see that, under this bizarre disguise, the Chinese had possessed the magic square of three.

4	9	2
3	5	7
8	1	6

FIG. 2.—The *Lo Shu* in numerical form

At first sight this may not seem much of an improvement. The magic square of three itself has been dismissed as a mere toy, a playing with numbers, because it is so simple to construct, and its most obvious property—the ability to produce the sum of 15 with every row and column and the two diagonals—appears to be a very trivial stunt. But still, even Western scholars have long realized, in spite of some bewilderment, that this must have been an important symbol in Old China for hundreds of years before it was finally exposed to public view in the tenth century. Why was it ever so highly regarded? No one has yet been able to produce a satisfactory answer.

The idea that a magic square might have been capable of expressing various religious or philosophical concepts has never been seriously considered by modern scholars; yet, in failing to recognize the possi-

[5] See n. 67, below, regarding the confusion between the two names.

[6] In general, the Confucianists seem to have referred to the diagram as the *Lo Shu*, while the Taoists called it the *Chiu Kung;* but this distinction may not have been consistently maintained. Here we shall use the *Lo Shu* quite generally, as a convenient term, where the Old Chinese might have preferred to say *Chiu Kung.*

bility of such representation, they have left untouched a fruitful and revealing area of old symbolism. For we shall find that this "simple" Chinese magic square of three not only helped to convey some of the most subtle concepts of Old Chinese scholarly and religious thought—during the Han dynasty, probably long before, and certainly for centuries after—but that it also apparently provided the foundation for certain literary statements that have long puzzled the Sinologues. In particular, a fuller understanding of the *Lo Shu* and its symbolism can help to explain some aspects of a "mysterious" old religion, the cult of T'ai-Yi, which, up to now, has been little known.

1. EARLY EVIDENCE FOR CHINESE KNOWLEDGE OF THE "LO SHU" SQUARE

An apparent ease in handling numbers is revealed in the very earliest written records of Ancient China. The inscriptions scratched on the oracle bones, which the Shang dynasty used for divination in the fourteenth century B.C., already show the Chinese counting by tens. This denary system put great emphasis on the numbers from 1 to 9, along with four place-notation symbols for indicating tens, hundreds, thousands, and ten thousands,[7] as these provided the roots for making all the rest. In fact, the Shang dynasty Chinese were apparently the first people in the world who could, and did, consistently express any number, however large, with only nine digits. They were regularly doing this some two thousand years before the Hindus learned to do the same thing with the numerals we now call "Arabic."[8] The Old Chinese emphasis on the first nine numbers was further stressed by their multiplication table, which from an early date to recent times only went to nine times nine.[9] However, all this accent on the primary digits still could not account for a tremendous interest in these nine numerals—especially 5 and 9—which appeared in China after 400 B.C.[10] In fact, all the evidence for this new enthusiasm suggests that it probably was stimulated by knowledge of the magic square of three.

During the "Warring States Period," from the sixth to the third centuries B.C., toward the close of Ancient China's feudal age, the

[7] Needham, *Science and Civilization*, III, 15, points out that these place-value components were not in themselves numerals.

[8] Most scholars now accept the view that our so-called "Arabic"numerals must be traced back to Hindu numbers, as their earliest forms have been found in India.

[9] See Li Yen, *Chung-kuo suan-hsüeh shih* (1936), pp. 6 and 7, for a discussion of Old Chinese multiplication tables. Examples have been recovered from as far back as the Han dynasty, *ca.* 100 B.C.

[10] Already in the philosopher Mo-tzŭ, whose work is attributed to the early fourth century B.C., we find mention of the Five Colors, Five Tastes, Five Foods, Five Grains, Five Punishments, etc., indicating the beginning of the trend.

politically troubled times witnessed a remarkable flowering of philosophic speculation that roughly paralleled the Age of the Philosophers in Greece. Various schools of thought arose in the detached kingdoms, each attempting to explain the nature of man and the universe, while seeking a cause and cure for the disunity of China and the ever increasing social chaos. Some of these systems began to be expressed in terms of numbers.

Among the records of the thinkers of that period that have been preserved, we find a pronounced tendency to divide things into groups of nine equal units of which the center one was, for one reason or another, especially significant. For example, there seems to have been a generally agreed tradition that China, the "Middle Kingdom" at the center of the world,[11] had anciently been a united nation divided by King Yü into Nine Provinces, of which the central one contained the capital with the residence of the supreme ruler.[12]

A number of philosophers—including the famous Mencius, a later follower of Confucius—even maintained that the Chinese in antiquity had employed a system of feudal landholding in which the rulers had split their domains into square blocks of land, each subdivided into nine equal, smaller squares, of which they assigned the eight outer ones to individual families of serfs for their fields and dwellings, while the central one was the lord's land, cultivated for his benefit by all eight families.[13] This arrangement seems to have been purely theoretical, as we have no real evidence to show that such a system was actually practiced in ancient times.[14] Apparently it was only an attempt to apply the traditional organization of the nation as a whole to the smaller units which composed it.

The idea reappears, on a much vaster scale, in the thinking of Tsou Yen (*ca.* 350–270 B.C.), a younger contemporary of Mencius. He was a man from the state of Ch'i, in what is now Shantung, and is traditionally regarded as the founder of the Yin-Yang and Five Elements school of philosophy, which became very popular in the Han dynasty.[15]

[11] The Chinese name for China, *Chung Kuo*, means "Middle Kingdom" or "Central Nation," and throughout history they have considered it as the proper center of the Earth, surrounded by "barbarians."

[12] The traditional division of China into the Nine Provinces by King Yü is described in the *Yü Kung* or "Tribute of Yü," which forms part of the *Shu Ching*.

[13] Mencius, III*a*, chap. 3; see Legge, *Chinese Classics*, II (London, n.d.), 119–21.

[14] Granet, among others, has suggested that this "*ching* system" may only represent some historical utopia and that it quite probably originated in a transposing of current ideas into the past, about the time of Mencius (see M. Granet, *La Civilisation chinoise* [Paris, 1948], p. 178).

[15] For a brief account of Tsou Yen's life and thought see Fung Yu-lan, *History of Chinese Philosophy*, trans. Derk Bodde, I (Princeton, 1952), 159 ff.

Among the fragments that have survived from his once-voluminous writings, we find a passage stating that China was one of Nine Territories comprising a continent, and that there were nine such continents that together made up the world,[16] the central one containing the great mountain that formed the cosmic axis.

It was probably at this period, also, that some philosopher or philosophic school composed an idealized document called the *Hung Fan*, which is usually translated as "The Great Plan," detailing the obligations and responsibilities of a supreme sovereign. Supposedly written by an ancient king, this plan, it was hoped, might again be applied when China eventually achieved the hoped-for unity. It was preserved in the *Shu Ching* or "Classic of History,"[17] and—like the *Lo Shu* itself—tradition ascribed it to the Great Yü who had seen the sacred turtle in the Lo River. In fact, legend held that this had occurred to him when he viewed that beast's nine markings. Thus it was directly linked with the *Lo Shu*, and this connection was strongly emphasized by some later writers.[18] Quite significantly, the *Hung Fan* appears in nine sections, of which the fifth—the middle one—was devoted to the ideal sovereign and his perfection. Not only was this the central unit, it also served as the pivot for all the rest; as the four preceding sections told how the royal perfection might be accomplished, while the four that followed showed what must be done to maintain it. So again we find a marked stress on the central unit in a group of nine.

About the beginning of the second century B.C., we find in an early book of mathematics by Hsü Yo, a noted astronomer of Ch'in and Early Han, the first reference to the "Nine Halls Calculation" (*Chiu-Kung suan*) in a section on various forms of divination. We know from numerous later references that this referred to a special use of the *Lo Shu* diagram; but we have definite confirmation in a later commentary by the Taoist Chên Luan (sixth century A.D.), who explains the reference to the Nine Halls by the quotation, "2 and 4 make the shoulders, 6 and 8 make the feet; 3 is at the left, 7 is at the right; 9 is worn on the head and 1 is underfoot [literally: trodden by the shoes]; while 5 dwells

[16] *Ibid.*, pp. 161–62. For the original text see Ma Kuo-han, *Yü-han-shan-fang chi-yu-shu* (Changsha, 1883), chap. 77; *Tsou-tzŭ*, p. 1.

[17] See Legge, *Sacred Books of China*, Part I, "The *Shu King*," Book 4, pp. 137–49, for a translation of the *Hung Fan*.

[18] The *Wu-hsing ta-yi*, written by Hsiao Chi toward the end of the sixth century A.D., quotes the *Hung Fan* section of the *Shu Ching* as not only using the nine numbers of the *Lo Shu* to head its respective sections, but also using directional terms to cite the exact location of each number as it occurred in the nine-cell plan of the *Lo Shu*. It is possible that the author was quoting an actual edition, current in his time, but since lost (see *op. cit.* [*Ts'ung-shu chi-ch'êng* ed.], I, 16).

at the center."[19] This quotation, describing the numbers of the magic square of three in their proper order, was taken from a much earlier book, long since lost, called "The Classic of the Nine Halls of the Yellow Emperor."[20] The passage was frequently quoted by other later writers as though it were a description of the pattern on the sacred turtle as it was first seen by King Yü, although the wording shows quite obviously that it must have referred to an application of the magic square of three to a person, probably a man or god considered as a microcosm of the universe.[21]

The earliest direct mention of the magic square of three appears in the *Ta Tai Li-chi*, a book purporting to describe ancient Chinese rites and ceremonies from the Chou dynasty and earlier. Apparently compiled in the first century B.C. from earlier sources, some of which undoubtedly date back to the Warring States, this has a section devoted to a traditional cosmic temple called the Ming T'ang, which was supposed to represent in architectural terms many of the cosmological ideas of the earlier philosophers. Here, in a passage describing the nine rooms of the main building, we find the following numbers: 2, 9, 4; 7, 5, 3; 8, 1, 6; each set of three intended to be read from right to left, so they follow exactly the order of their appearance in the *Lo Shu* square. Unfortunately, the text as now preserved seems incomplete, and it does not say exactly how these numbers applied to the rooms.[22]

Both Chinese and Western scholars have generally assumed that this reference was the origin of the term "Nine Halls," in allusion to the nine rooms; but this is a false assumption.[23] In the first place, the rooms in the Ming T'ang were called *shih*, the regular word for rooms

[19] Hsü Yo, *Su-shu chi-i* (preserved in the *Huai-lu ts'ung shu*), p. 9. This author apparently uses the word *suan*, usually translated as "calculation with numbers," to refer to ways of calculating fortunes, or divination. In addition to divination by the Nine Halls diagram (otherwise known as the *Lo Shu*), he lists thirteen other methods, including divination by the Eight Trigrams and divination by (or, with the aid of) T'ai-Yi. This subject will be discussed more fully in Sec. 6, below.

[20] The *Huang-ti chiu-kung ching* mentioned in the *Sui Shu*, 34.12, among other earlier books on occult subjects.

[21] To speak of wearing 9 like a hat and having 1 under the shoes, as well as referring to two shoulders and two legs, is scarcely the way one would talk about an animal. In discussing the turtle, even if one wished to disregard the tradition that all nine marks were on its shell, one would still refer to four legs, and mention the 1 as being at its tail.

[22] *Ta Tai Li-chi*, chap. 8; *Szŭ-pu ts'ung-k'an* ed., p. 43. These numbers stand in a group by themselves, in the existing text, having no immediate connection with what precedes or what follows, as though something had been lost in transmission.

[23] The false assumption that the term "Nine Halls" referred to the nine rooms of the Ming T'ang was most recently expressed by Needham in *Science and Civilization*, III, 58, and by myself, in "Evolution of Magic Squares in China," p. 118; both of us were misled by previous statements, including one in the *Tz'ŭ Yüan* dictionary, under "*Ming T'ang.*"

or apartments, and not *kung*, which refers to detached palace halls. In the second place, we shall see that Old Chinese tradition recognized the term *chiu kung* as describing nine palaces (or regions) in the central section of the Nine Divisions of Heaven,[24] corresponding to the Nine Provinces of China that were located at the center of the Earth.

In short, the early emphasis on blocks of nine units with special stress on the central one—involving the Nine Continents, the Nine Territories, the Nine Provinces of the Middle Kingdom, and the nine-field feudal holdings, like the nine numbers of the cosmic man, the nine rooms of the Ming T'ang, and the Nine Divisions of Heaven with the Nine Halls—all seem to have been conceived in a determined effort to apply to the greater world the plan of the simple magic square of three. (Conversely, we shall later see that the *Lo Shu* magic square was in itself considered as a universe in microcosm.) In spite of the loss of so much of the old learning, due to the official destruction of the ancient books at the end of the third century B.C.,[25] and in subsequent purges, we have here enough accumulated evidence to indicate that this trend of thinking must already have reached an extensive development in Ancient China by the end of the fourth century B.C. In fact, the first literary reference to the term *Lo Shu* occurs in the *Chuang Tzŭ*, supposedly written about that time.[26]

Beyond the fourth century B.C. we cannot trace the magic square of three in China itself; but the trail may possibly lead still farther back elsewhere. The old claim that magic squares may have been invented in India cannot be supported by any evidence, and the ultimate source would seem to lead still farther West. The complex numerical symbolism that first appeared in China about the fourth century—of which we have as yet seen only a small sample—has often recalled to European scholars the number theories of the followers of Pythagoras, who lived at the other end of the civilized world some two centuries earlier. However, tradition says that Pythagoras spent some time in

[24] In Sec. 5, dealing with the cult of T'ai-Yi, we shall discuss this more fully, as the theory of the Nine Halls in the sky figures prominently in that religion.

The Old Chinese astronomers and astrologers commonly used the word *kung* to denote a stellar "house" or region of the sky; but in the case of the quite literal personification of a star, such as we find with T'ai-Yi, it was quite natural to carry the humanization all the way and conceive of the star-god as living in a literal palace (or palaces). The Han texts show that people actually believed that T'ai-Yi had his main residence in the Purple Palace in the center of Heaven, at the spot marked by the North Star; therefore it seems probable that the other eight *kung* were equally literally conceived as palace halls.

[25] We shall discuss these mass censorships more fully below.

[26] *Chuang-tzŭ*, XIV, 2; see Legge, *The Texts of Taoism*, Part I (Oxford, 1891), p. 346. He speaks of the "nine *Lo*," but it has always been assumed that he was speaking concisely regarding the nine numbers of the *Lo Shu*.

Babylon,[27] and whether or not he did, many of the ideas ascribed to him and his disciples would seem to have stemmed from Western Asia.[28]

In the first place, the deep secrecy with which the *Lo Shu* seems to have been shrouded in China until very late—being alluded to, but not openly illustrated—seems typical of the Pythagorean attitude toward their inner arcana, such as the *tetraktys* of ten.[29] Then, when the *Lo Shu* was finally revealed to public view in the tenth century A.D., after some thirteen hundred years of hidden, private or cultic use, it emerged as a diagram representing numbers by means of dots, recalling the early Pythagorean habit of expressing numbers with dots or pebbles.[30] More significantly, we shall find some remarkably close correspondences between Chinese and Pythagorean ideas when we come to consider the Old Chinese interpretations of the inner workings of the *Lo Shu*.

Despite all this, after centuries of research, the European classical scholars have failed to discover any tangible evidence that the magic square of three—or any other magic square—was known to the Ancient Greeks, even though the idea of arrangements of numbers in symmetrical figures to produce effects of balanced harmony would have also been quite typical of the Pythagoreans. The so-called "Square of Theon," which appears among the writings of the Neo-Pythagorean Theon of Smyrna, from the third century A.D., is sometimes cited as one; but, as I have pointed out elsewhere, that was not a magic square at all.[31]

On the other hand, the fact that the Chinese magic square of three was, from quite an early date, intimately involved with star-gods and

[27] According to the somewhat doubtful biography by Iamblichos, Pythagoras spent twelve years in Babylon (see George Sarton, *History of Science*, I [Cambridge, Mass., 1952], 200).

[28] Even the much-vaunted "Pythagorean theorem," stating that the square on the hypotenuse of a right triangle is equal to the sum of the squares on the other two sides, was known to the Babylonian mathematicians more than a thousand years before Pythagoras (see O. Neugebauer, *The Exact Sciences in Antiquity* [Copenhagen, 1951], p. 35).

[29] This was a triangular figure composed of ten dots, arranged in rows of one, two, three, and four, and it was supposed to have been one of the principal secret emblems of the Early Pythagoreans, by which they swore (see Sarton, *op. cit.*, pp. 204–5).

[30] *Ibid.*, pp. 205, 208, and John Burnet, *Early Greek Philosophers* (London, 1908), pp. 110–11.

[31] Cammann, "Evolution of Magic Squares in China," p. 118. C. A. Brown, Jr., once constructed a very complex magic square "on Pythagorean principles" and claimed that it must have been known to the Ancient Greeks (see W. S. Andrews, *Magic Squares and Cubes* [Chicago, 1917], pp. 146–58). This was a clever mathematical feat, but his conclusions were historically untenable.

with various kinds of divination,[32] would tend to support the idea that it might have arisen in Mesopotamia, which traditionally gave to both China and the Classical World so much astrological lore. But, again, we have no real evidence on this from that quarter until the close of the ninth century A.D., when an Arabic scholar, Tābit ibn Korra (836–901) is said to have discussed the magic square of thrêe.[33] Thus, while it remains possible that the Babylonians and/or the Pythagoreans may perhaps have had the magic square of three before the Chinese did, more definite evidence will have to turn up from the Middle East or the Classical World before China can lose her claim to the earliest known magic square by more than a thousand years.

2. THE "LO SHU" SQUARE AS AN EXPRESSION OF CENTRALITY

The concept of the Middle Kingdom at peace, strong and united under a forceful ruler, which had been only a longed-for ideal in the time of the Warring States, was finally realized by the establishment of a Chinese Empire under the Ch'in dynasty (221–207 B.C.). But this was only accomplished by excessive cruelty and extremes of totalitarian despotism. Among the many severe measures taken by the First Emperor, Shih Huang-ti, in his efforts to insure the continuation of this hard-won national unity, was the burning of the books in 213 B.C., with the expressed intention of removing possible sources for divergent thinking; but, as he had a special fondness for magic and divination, he ordered that books on these subjects should be spared.[34] Many of the latter were destroyed in their turn, during the burning of the vast Ch'in palace some ten years later; yet some must have survived, because the old interest in number symbolism, divination, and magic persisted on into the Han dynasty, which succeeded in reuniting China and keeping it together for a longer period (from 202 B.C. to A.D. 220). In fact, during the first century B.C., an extensive literature sprang up devoted to these subjects, finding its typical expression in the so-called "*wei* books," a number of which were specifically devoted to the *Lo*

[32] The intimate connection of the *Lo Shu* with star-gods and divination will be fully discussed in Secs. 5 and 6.

[33] By then, the Arabs had long engaged in extensive trade with China; but this scholar came originally from Harran in Mesopotamia, which had an ancient tradition of astrology and mathematics, so it is remotely possible that the square might have been indigenous there.

[34] Modern Sinologues differ regarding the extent of destruction of ancient literature caused by the burning of the books and the subsequent firing of the Ch'in palaces, but it must have been enormous; and much of what survived these major disasters probably perished with the contemporary revolution in writing methods and materials, which made the old books obsolete. The latter fact was stressed by C. S. Gardner, *Traditional Chinese Historiography* (Cambridge, Mass., 1938), p. 12.

Shu and related numerical diagrams, especially in connection with divination.[35] However, the *wei* books were also destroyed in a series of Orthodox Confucian purges which culminated in a final proscription in 605.

After all this destruction of old literature, it should be obvious why we have so little information about the early history and development of the *Lo Shu*, which was already semisecret anyhow. But, in spite of all this, enough evidence remains to show that the magic square of three must indeed have been the object of a rather extensive cult—or series of cults—reaching fullest expression in the Han period.

Although modern scholars have expressed surprise that "the simple magic square of three," a mere "mathematical puzzle," was able to exert a considerable influence on the minds and imaginations of the cultured Chinese for so many centuries, they could have found most of the answers right within the square itself.[36] But, up to now, no one has attempted to analyze its inherent mathematical properties, or the numerical significance of its numbers—singly or in combination—and then tried to consider these in the light of Old Chinese cosmological concepts.

Such an analysis speedily reveals why the middle number of the *Lo Shu*, 5, was so vitally significant for the Chinese ever since the earliest hints that they had a knowledge of this diagram. The importance of this 5 can largely be explained by the natural mathematical properties of the middle number and its special relationship to all the rest of the numbers—quite apart from any numerological considerations, which is to say, any symbolic meaning arbitrarily assigned to it. Indeed, mathematically speaking, it was both functionally and symbolically the most important number in the entire diagram.

If one takes the middle number, 5, and multiplies it by 3 (the base number of the magic square of three), the result is 15, which is also the constant sum of all the rows, columns, and two main diagonals. Then, if the middle number is activated to its greatest potential in terms of this square, through multiplying it by the highest number, 9 (which is the square of the base number), the result is 45; and the latter is the total sum of all the numbers in the square, by which all the other

[35] For the *wei shu* and the related *ch'an shu* (the latter devoted to the results of divination) see Fung Yu-lan, *Chinese Philosophy*, II, 88–91; J. P. Bruce, "The *I Wei:* A Problem in Criticism," *Journal of the Royal Asiatic Society, North China Branch*, LXI (1930), 100 ff.; and Tjan Tjoe-Som, *Po Hu T'ung*, I (Leiden, 1949), 100–120.

[36] Legge once wrote that the magic square of three might be called "the *reductio ad absurdum* of the Lo writing," never realizing that he had there the key to the whole riddle (see Legge, *Yi King*, p. 18, n. 1).

numbers are overshadowed and in which they may be said to be absorbed.[37]

Furthermore, the middle number of the *Lo Shu* is not only the physical mean between every opposing pair of the other numbers, by reason of its central position; it is also their mathematical mean, since it is equal to half the sum of every opposing pair, all of which equal 10. In fact, the neat balance of these pairs, and their subtle equilibrium, would have had special meaning in the minds of the Old Chinese. For they considered the odd numbers as male and the even ones as female,[38] equating the two groups with the Yang and Yin principles in Nature; and in this square, the respective pairs made up of large and small odd (Yang) numbers, and those composed of large and small even (Yin) numbers, were all equal to each other. Thus all differences were leveled, and all contrasts erased, in a realm of no distinction, and the harmonious balance of the *Lo Shu* square could effectively symbolize the world in balanced harmony around a powerful central axis.

The tremendous emphasis on the 5 in the *Lo Shu* square—for purely mathematical reasons—and the fact that this number so neatly symbolized the heart and center of the universe, could well explain why the Old Chinese seem to have so revered the number 5,[39] and why they put so much stress on the concept of Centrality.[40] These twin tendencies seem to have reached their height in the Han dynasty.

The existing reverence for Centrality must have been still further stimulated toward the close of the second century B.C., when the Han Emperor Wu Ti ordered the dynastic color changed to yellow—which symbolized the Center among the traditional Five Directions—and took 5 as the dynastic number, believing that he would thus place him-

[37] These properties are common to any well-made odd-number magic square; as such, they can be expressed in two formulas of general application.

If we let n equal the base number of the square (that is, the number of cells on one side); m, the vital middle number; c, the constant sum of all the rows and columns and the two principal diagonals; and t, the total sum of all the numbers; then: $nm = c$, and $n^2 \cdot m = t$.

[38] Tradition says that the Pythagoreans also made a distinction between male and female numbers.

[39] Although no direct mention of the permutations of the number 5 in the *Lo Shu* has yet turned up in a Chinese text, I would never expect to find one. In the first place, this would be the kind of thing that was traditionally passed on by oral transmission from a senior adept to his disciple as a secret doctrine. In the second place, once these phenomena have been demonstrated, they seem so obvious that they could be taken for granted and no one would have needed to call attention to them in writing, as long as they remained part of a living tradition.

[40] Of course, a symbolic regard for the Center was not confined to China. Mircea Eliade briefly discussed this as a quite general cultural phenomenon in his brilliant book, *The Myth of the Eternal Return* ("Bollingen Series," No. 46 [New York, 1954]), pp. 12–13, with references to other works.

self, his imperial family, and the nation under the most auspicious influences. His immediate motive for doing this may not have been directly inspired by the *Lo Shu*,[41] but this measure must inevitably have increased the existing beliefs in the latter's efficacy.

After this time, inscriptions on the Han bronze mirrors, as well as other writings, emphasized the desirability of keeping one's self at the center of the universe, where cosmic forces were strongest.[42] Later, we shall see what happened when an emperor took this idea too literally.

All this emphasis on Centrality and on the number 5 as a symbolic expression of the Center, which seems to have begun as far back as 400 B.C., also may conceivably have led to the development of the Five-Elements School and the subsequent efforts to fit everything into numerical categories of five. We find, for example, such groupings as the Five Ancient Rulers, the Five Sacred Mountains, the Five Directions (with Center), the Five Metals, Five Colors, Five Tastes, Five Odors, Five Musical Notes, Five Bodily Functions, Five Viscera, and many others. This trend has often been ascribed to the cult of the Five Elements itself, as though they had served as the base for all the rest; but why did the Old Chinese postulate *five* elements, when the Ancient Near East—which may have initiated the idea that natural elements exerted influence in human life and activities—recognized only four?[43] And why did the Chinese suddenly begin to talk about the Five Directions, when the animals they used as symbols of the directions designated only the usual four?[44] Obviously, something suddenly caused them to start thinking in terms of fives, and that may have been the workings of the *Lo Shu*.

This whole tendency had an unfortunate effect on Chinese thinking. Whereas the primary meanings of the *Lo Shu* diagram seemed to have been based on its inner mathematical properties—and we shall see that even its secondary meanings rested on some mathematical bases

[41] It is usually stated that Emperor Wu decreed the adoption of Yellow and the number 5 in 104 B.C. because the previous dynasty of Ch'in had been ruling by virtue of the element Water, and therefore the Han, as its successor, must be ruling with the element Earth—since Earth followed Water in (one of several versions of) the cycle of the Five Elements. But the Han had already been ruling for nearly a hundred years, so this seems a rather late decision, and the explanation is not wholly convincing. Possibly it was merely a rationalization.

[42] See S. Cammann, "The 'TLV' Pattern on Cosmic Mirrors of the Han Dynasty," *Journal of the American Oriental Society*, LXVIII (1948), 166.

[43] The Four Elements in the Near East were: Earth, Fire, Water, and Air. A suggestion that the theory of the elements may have been invented, or at least diffused, by the Ancient Iranians was made by Jean Przyluski, "La Théorie des éléments et les origines de la science," *Scientia*, LIV (1939), 1–9.

[44] The four directional animals of Old China were the Scarlet Bird of the South, the Blue Dragon of the East, the Black Warrior (Tortoise) of the North, and the White Tiger of the West.

—the urgent desire to place everything into categories of fives led to other groupings based on other numbers, until an exaggerated emphasis on mere numerology pervaded Chinese thought. Scholars made numbered sets of as many things as possible in Nature, or assigned arbitrary numbers to individual things, in a fashion that seems to the modern scientific mind as downright nonsensical, and philosophical ideas based upon all this tended to stifle speculative thought in China for many centuries.[45]

3. YIN AND YANG IN THE "LO SHU" SQUARE

Although the primary mathematical properties of the middle number at the center of the *Lo Shu*, and the interrelation of all the other numbers to it, might seem enough to account for the deep fascination which the *Lo Shu* held for the Old Chinese philosophers, this was actually only a beginning of wonders. For the *Lo Shu* square was a remarkably complete compendium of most of the chief religious and philosophical ideas of its time. As such, one cannot fully understand the thought of the pre-Han and Han periods without knowing the meanings inherent in the *Lo Shu;* but, conversely, one cannot begin to understand the *Lo Shu* without knowing something about the world view of the Old Chinese, which they felt they saw expressed in it.

The Chinese world view during the Han dynasty, when the *Lo Shu* seems to have been at the height of its popularity, was based in large part on the teachings of the Yin-Yang and Five-Elements School, which was traditionally founded by Tsou Yen. According to this doctrine, the universe was ruled by Heaven, *T'ien*—as a natural force, or in the personification of a Supreme Sky-god[46]—governing all things by means of a process called the *Tao*, which can be roughly interpreted as "the Order of the Universe" or "the Universal Way." Heaven, acting through the Tao, expressed itself by means of the workings of two basic principles, the Yin and the Yang. The Yang, or male principle, was the source of light, heat, and dynamic vitality, associated with the Sun; while the Yin, or female principle, flourished in darkness, cold, and quiet inactivity, and was associated with the Moon. Together these two principles influenced all things, and in varying combinations they were present in everything.

We have already seen that odd numbers were considered as being Yang, while the even numbers were Yin, so that the eight outer num-

[45] See Derk Bodde, "Types of Chinese Categorical Thinking," *Journal of the American Oriental Society*, LIX (1939), 202 ff.

[46] *T'ien*, or Heaven, was regarded in several different ways in the history of Chinese thought (see Fung Yu-lan, *Chinese Philosophy*, I, 31; and Giles, *Chinese-English Dictionary*, II, 1387, No. 11, 208).

bers of the *Lo Shu* represented these two principles in balanced equilibrium around the axial center. During the Han dynasty, another Yin-Yang conception was applied to the *Lo Shu*, considering the latter as a plan of Ancient China. Instead of linking the nine numbers of this diagram with the traditional Nine Provinces, as was usually done, this equated the odd, Yang numbers with mountains (firm and resistant, hence Yang) and the even numbers with rivers (sinuous and yielding, hence Yin); taking the former from the Five Sacred Mountains of the Han period and the latter from the principal river systems of Old China.

Thus the middle number, 5, represented Sung-Shan in Honan, Central China; the 3, T'ai-Shan in Shantung, East China; the 7, Hwa-Shan in Shensi, West China; the 1, Hêng-Shan in Hopei, North China (or the mountain with the same name in neighboring Shansi); and the 9, Huo-Shan in Anhwei, which was then the South Sacred Mountain. For the rivers, the 4 represented the Huai, to the (then) Southeast; the 2, the San Kiang (three rivers) in the (then) Southwest; the 8, the Chi in the Northeast; and the 6, the (upper) Yellow River in the Northwest.[47]

Note that by Western standards this plan was "upside down," as it put North at the bottom and South at the top, with the other directions correspondingly altered; but in this respect it was merely following the accepted Chinese convention for all maps. The same arrangement was used when the *Lo Shu* was equated with the Nine Provinces;[48] and whenever the *Lo Shu* involved directional symbolism, it was oriented in this same fashion.

In both the systems just discussed, the *Lo Shu* represented the Yin and Yang merely at rest, or in a state of static equilibrium; but this was not an adequate expression of the workings of these two great natural forces according to the Old Chinese view. For the people of Han China, the world was an organism in constant flux, with the Yin and the Yang alternately waxing and waning in the course of each passing year. Also, since they observed that heat and light were strongest in the summer, and most characteristic of the South, while cold and dampness came in winter and increased as one went North, they evolved a seasonal and directional theory of the Yin and Yang.

[47] This arrangement was described in a passage from a lost book called the "Classic of the Nine Halls" (*Chiu-kung ching*); the passage itself is preserved in the *Wu-hsing ta-yi* (*Ts'ung-shu chi-ch'êng* ed.), I, 20.

[48] For example, the listing in the *Lü-shih ch'un-ch'iu*, which equates the legendary Nine Provinces with political divisions existing in Late Chou, clearly shows the southern regions at the top, northern at the bottom, eastern at the left, and western at the right.

(The belief in the South as source of the positive Yang must have been strengthened after the men of Han discovered the South-pointing compass.[49]) This process, by which each principle dominated for six months, was not a simple alternation, with the influence of one ceasing entirely as the other took over. The cycles of Yin and Yang were each complete, extending throughout the entire year, and neither of them was ever actually extinguished. Even when the Yang was almost entirely eclipsed at the height of Yin, a fragment of it lingered on, and vice versa.

To understand how both these cycles could be considered as occurring simultaneously in a single diagram, one must remember two Old Chinese conventions. First, they considered 10 to be the complete number,[50] so that the first nine were perfected in 10 (which was also a typically Pythagorean viewpoint[51]). In view of this, the complement of any of these other numbers would be the difference between that number and 10. Thus 9 was the complement of 1; 8, of 2; etc. Second, they regarded the odd numbers as primarily Yang, while the even numbers were primarily Yin; but, since they also recognized that Yang and Yin were complementary opposites, the complement of a Yang number—whether even or odd—would be Yin; and the complement of a Yin number—whether odd or even—would be Yang. Therefore, each digit in the *Lo Shu* had as its complement another number which made up the difference between that digit and 10 and which represented the opposing principle.

Thus the 9 at the top (or South side) of the *Lo Shu* was full Yang, but it had as its complement the 1 of Yin; while the 1 at the bottom (or North side) of the diagram, was also Yang, but it was overshadowed by its (invisible) complement, the 9 of full Yin. It was most appropriate in terms of Chinese thinking that the secretive and recessive principle in Nature, the Yin, should keep its fullest powers hidden.

[49] By the first century A.D. the men of Han possessed a kind of compass which pointed to the South (to be described in Sec. 6, below). When this had been achieved, the Chinese could most naturally think of the South, the home of the Yang, as the source of positive and dynamic power; and the North, home of the Yin, as inactive and recessive. Thus they could have considered Yang and Yin as positive and negative poles, respectively, of a cosmic field of force. If such observations came too late to determine the conceptions of Yin and Yang as outlined above, they must at least have strengthened them.

[50] Not only was ten known from an early period as the "complete number," this idea still lingers in common speech in China, where "ten-parts good" (*shih-fên hao*) means "completely fine." Incidentally, Hsü Yo lists a "Complete Number calculation" (*Chêng-shu suan*), as well as a "Revolving Numbers calculation" (*Yün-shu suan*), without explaining either; and one wonders from the names whether either, or both, might have had reference to the system outlined above.

[51] In addition to the Pythagorean views already cited regarding ten (see reference in n. 29), another "Pythagorean" view of ten is discussed at the end of Sec. 5, below. See the reference in n. 107.

If these preliminary remarks are fully understood, we can now go on to consider a set of diagrams illustrating the separate cycles of the Yang and Yin represented in the numbers of the *Lo Shu*, proceeding clockwise and following the Chinese system of orientation.

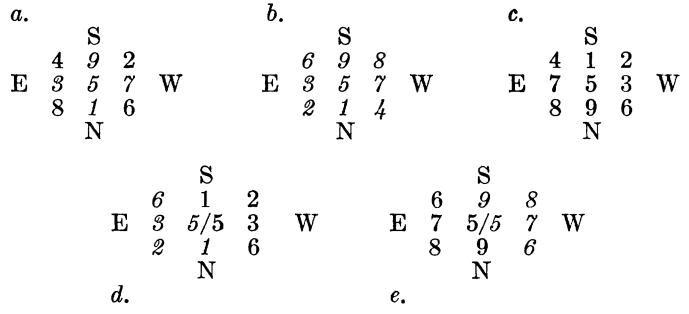

FIG. 3.—Some Yin-Yang implications of the *Lo Shu* (Yang numbers in italics). *a*, the original *Lo Shu; b*, the Yang cycle in the *Lo Shu* scheme; *c*, the Yin cycle in the *Lo Shu* scheme; *d*, Yin and Yang in their waxing stage; and *e*, Yin and Yang at their height and beginning decline.

In this way, the *Lo Shu* was able to represent the world with the North as the initial source of Yang but the South and West as the main fields of its influence; while the South saw the birth of Yin, but the North and East marked the scene of its fruition. Meanwhile, shifting from space to time, the Yang began feebly in mid-Winter and flourished in mid-Summer and early Autumn; while the Yin started in mid-Summer but did not gain strength until mid-Winter, gradually declining again in early Spring. The whole Chinese theory of the Four Seasons was based on this concept, and even if this theory may have been held before the *Lo Shu* was known (although that cannot yet be proved), the *Lo Shu* was still a most graphic illustration of it.

The Old Chinese had a second possible method of expressing the symbolism of the cycles of the Yin and Yang and the Four Seasons, by using two complementary diagrams instead of the *Lo Shu* alone.

Although they never varied the way in which they represented the *Lo Shu* as such—as long as it remained the focal point of a living tradition—a magic square of three can actually be presented in eight separate ways, and the Old Chinese did sometimes use one of the alternatives for symbolic purposes.

Of the eight possible variants of the magic square of three, the *Lo Shu* form is perhaps the most common everywhere, but this same square can also be shown resting on either side or upside down; or any of these first four positions can be inverted, as though viewed in a mirror. Mathematically speaking, there is no real difference between

all these—for the seven alternatives are only rotations or reflections of the original one, and the order and relationship of the numbers in each always remains the same—but the Old Chinese apparently recognized only two positional variants, and considered them each as totally different squares. This was because their rather elementary methods of construction force them to make each in a different way, in addition to the fact that the different positions affected the symbolic interpretations that they read into them.

We know from a late Sung book on mathematics, written in 1275 but admittedly taken from earlier works,[52] that the traditional way to construct the *Lo Shu* was to tilt the natural square of three on its lower left corner—or else to write the digits from 1 to 9 in three parallel lines slanting downward to the right—to produce a diamond pattern, then to exchange the opposing odd (or Yang) numbers that formed the points of the diamond (1 and 9, 3 and 7), after which the diamond was compressed or drawn inward to form a square.

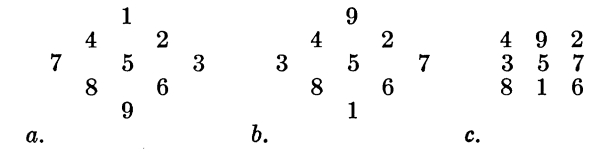

FIG. 4.—Old Chinese method for making the *Lo Shu* square of three by making a diamond from the natural square, then exchanging the numbers at the points, and, finally, collapsing it to form a square.

The Sung author does not directly mention any alternative method of construction; but he does reproduce two earlier magic squares of higher numbers, each of which had a central core made of a 3×3 square, patterned after a second variation of the magic square of three.[53] This second type of three-square could be created by taking the same diamond and exchanging the even, or Yin, numbers at the center of each side—instead of the odd, Yang ones at the points—then collapsing the diamond as before. The resulting square is the exact opposite of the *Lo Shu*, being both upside down and backward in relation to the latter.

[52] Yang Hui, *Hsü-ku chai-chi suan-fa* (published in Hangchow in 1275). The original work is extremely rare, and alleged reprints of it in various later collections are invariably incomplete, lacking the magic squares. Li Yen, a modern Chinese mathematical historian has discussed in several of his books the problem of the rarity of Yang Hui's original works. He had a personal copy of the original book cited above, with the magic squares intact, and has reproduced the latter with a brief discussion of them in the various editions of his book called *Chung suan-shih lun-ts'ung*. The *pai-hua* edition of 1954 has these in I, 175 ff.

[53] *Li Yen, ibid.*, pp. 180–81, the first square of five, and the first square of seven. The first of these, and the method of constructing it, are illustrated in Cammann, "Evolution of the Magic Square in China," p. 117, figs. 5 and 6.

We know that the *Lo Shu* proper was associated with the sky because another name for it was "the Heavenly numbers of the Nine Halls (or Palaces)," and we find specific mention of those halls as sky-dwellings visited by various celestial deities.[54] The association of its exact opposite with the Earth is not so openly expressed; but we can be confident that this must have been an accepted convention, for several reasons. The chief of these is that fact that, among the Early Chinese magic squares that survived to be republished in the Sung, the squares of five and seven were presented in pairs, the second member of each pair being constructed on a *Lo Shu* frame, while the first was built upon a core formed by the three-square of the opposing type; and especially in the case of the first pair (the two squares of five), the inner symbolism of the numbers in the first of the two had an earthly connotation, while the numbers in the second square had been altered to give them a celestial meaning.[55] Thus the *Lo Shu* was related to Heaven, and its opposite to the Earth.

Since the *Lo Shu* proper was constructed by manipulating the Yang numbers and was associated with Heaven, which was fundamentally Yang in Old Chinese thinking, it would have been considered as being primarily a Yang diagram; while its opposite would have been basically a Yin square, since the latter was not only built by exchanging the Yin numbers of the natural square but was also associated with the Earth, regarded as Yin.

Now that we have seen that the Old Chinese had two contrasting forms of the magic square of three, with different symbolic meanings, we can go on to see how they could have used these together to express the cycles of the Yin and the Yang, changing with the successive seasons, by means of a second process, based on the mutual interaction of the two diagrams.

Assuming that the *Lo Shu*, as a celestial diagram, was considered as situated in the sky, directly above its opposite on earth, with the cycles of progression following the same direction in each, then, the Yang cycle would start in the upper, primarily Yang square, taking every second number in its succession from the complementary numbers in the lower square. Meanwhile, the Yin cycle would start in the lower, basically Yin square, taking its alternate numbers from the complements in the corners of the upper square.[56]

[54] Discussed in Secs. 5 and 6, below.

[55] The four squares are illustrated in Li Yen, *loc. cit.* The question of their inner symbolism is fully treated in a forthcoming article by the writer, "Old Chinese Magic Squares."

[56] The Han had a closely related diagram consisting of the Eight Trigrams arranged in a hollow square, and the trigram signs were recognized as corresponding

The Yang would then begin with the 1 in Heaven, dip down to earth for the 2, return to Heaven for the 3, etc., until in the course of a year it finally produced the Yang cycle, as shown in Figure 3, *a;* while the Yin would begin with the 1 on earth, dart upward for the 2 in Heaven, and descend to earth again for the 3, etc., until it re-created the Yin cycle, as shown in Figure 3, *b*. Thus, in a process of cosmic interplay, the Yang and the Yin would change places alternately, moving back and forth from one diagram to the other, as the year wheeled on in the eternal round, as though in a kind of cosmic dance.

4. HOW THE "LO SHU" REPRESENTED THE FIVE ELEMENTS

If the symbolism of the *Lo Shu* had been confined to representation of the Yin and Yang, in their balanced harmony or in their respective cycles, Tsou Yen and his followers would have considered this diagram quite deficient as a model of the world order, since the second preoccupation of their "Yin-Yang and Five-Elements School" was the Five Elements, as the name implies. They believed that the Yin and the Yang were not the only forces of nature through which Heaven kept the universe in orderly operation. In addition, there were these five vital powers which we usually describe as the Five Elements, although their Chinese name, *wu hsing*, really means "five agents," or "movers." Despite the fact that they were given literal names meaning Earth, Wood, Metal, Fire, and Water, they were not just material elements. They seem, rather, to have represented astrological forces emanating from the planets Saturn, Jupiter, Venus, Mars, and Mercury (which were called, respectively, Earth Star, Wood Star, Metal Star, Fire Star, and Water Star[57])—just as the Yang and Yin were powers emanating from the Sun and Moon, in token of which the latter were often called *T'ai Yang* and *T'ai Yin*. Yet these five forces were still thought to embody the qualities of the substances whose names they bore.

The Old Chinese believed that the Five Elements followed each other in temporal succession, paralleling the courses of the Yin and Yang and of the Four Seasons (which they helped to create). For a long time there does not seem to have been any general agreement on

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to, and interchangeable with, the eight outer numbers of the *Lo Shu*. (We shall discuss this principle more fully in Secs. 5 and 6.) In this other diagram, the signs at the cardinal points (middle of each side) were described as "direct," while those at the corners were known as indirect or subordinate, and, furthermore, the corners were described as "gates." Therefore, by analogy, the transfer of Yang and Yin between the *Lo Shu* and its opposite was taking place by means of the weaker numbers through the "gates," while the "strong" numbers firmly kept their places. (See J. P. Bruce, "The *I Wei*," p. 104.)

[57] See Giles' *Dictionary*, No. 4602.

the order of this succession,[58] but Tsou Yen arranged their cycle in the sequence listed above, on the principle that each element was "conquered" by its successors.[59] This seems quite logical, because Earth can be overrun by growing plants and trees, which were placed together under "Wood"; Wood can be cut up by Metal (axes and knives); Metal can be melted by Fire; Fire can be extinguished by Water; and Earth can clog or dam up water courses (as China's silt-laden rivers have drastically demonstrated again and again, throughout recorded history). Tsou also assigned to each a color: yellow for Earth, green for Wood, white for Metal, red for Fire, and black for Water.[60]

This cycle of Tsou Yen's was ingeniously assimilated to the other cycles in the *Lo Shu*, apparently on the basis of the agricultural calendar. Since the year began in early Spring, with the first waxing of the Yang, symbolized by the Northeast corner of the *Lo Shu*, the 3 and 8 (5 + 3) were assigned to Wood, which stood for growing plants as well as trees. The 4 and 9 (5 + 4) in the Southeast, representing Summer, were assigned to Metal, perhaps referring to the cultivation of the fields with metal tools at this season. The 2 and 7 (5 + 2) in the Southwest, representing Autumn, were assigned to Fire, since the fields were burned off after the harvest to fertilize them. The 1 and 6 (5 + 1) in the Northwest, representing Winter, were assigned to Water, probably because that is the season of clouds and rain (or snow); but possibly because the fields were generally flooded in winter to provide soft ground in springtime. Finally, the central 5 was assigned to Earth—the primal element in an agricultural nation—with the assumption that this would assist the others throughout the annual cycle; since the 5 was already present, in combination, in each of the corners. The emphasis on the corners of the *Lo Shu* in this system was still further stressed by the fact that in Ancient China the 5 would have been written in the form of an X, so its four extremities would have pointed outward toward the corners of the diagram.[61]

Apparently this emphasis on the corners did not satisfy another

[58] Karlgren, citing a number of passages from the well-known Chinese classics, has pointed out that the sequence of the Five Elements was not fixed in pre-Han texts and that the successions varied considerably (see B. Karlgren, "Legends and Cults in Ancient China," *Bulletin of the Museum of Far Eastern Antiquities*, XVIII [Stockholm, 1946], 222).

[59] A fragment from Tsou Yen's comments on the Five Elements is found in the *Yü-han-shan-fang chi-yu shu*, chap. 77, *Tsou tzŭ*, p. 2*b*. This lists the regular succession of the elements, the association of five traditional "Emperors" with the individual elements, and the colors for each.

[60] *Ibid.*

[61] When the *Lo Shu* finally appeared in dotted form, the central 5 was still depicted as an X, with a dot in the middle and one at each extremity. In later representations this was generally changed to a cross.

school of thought, more interested in the cardinal points, so they adopted a rival numerical diagram in the form of a cross, to display the four outer elements in the primary directions. They seem to have simply taken over the numbers given to the elements in the *Lo Shu*, but they slightly changed the order of presentation. Consequently, they found it necessary to provide another set of reasons for the sequence of the Five Elements, to explain why the latter should follow each other in this new way. As these explanations sound far less logical than those for Tsou Yen's system, it seems quite obvious that they were later rationalizations.[62] This second diagram was called the *Ho T'u*, or "River Plan." However, it, too, was given an air of spurious antiquity by a tale that claimed it had been brought by a supernatural beast to a mythical hero of long ago, so, in reference to this, it was also known as the "Dragon Writing" (*Lung Shu*).[63]

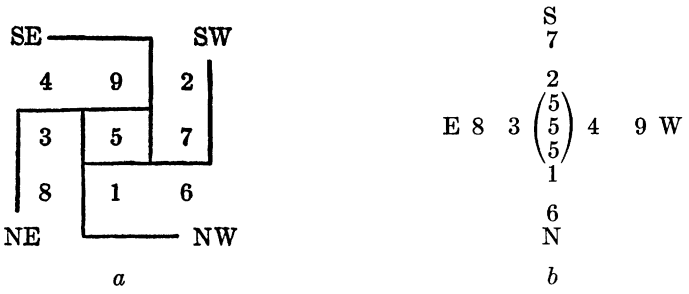

FIG. 5.—Two rival ways of listing the Five Elements: *a*, *Lo Shu; b*, *Ho T'u*, the stylized diagrams reduced to numbers.

Note that the *Lo Shu*, in comparison with the *Ho T'u*, appears to have bent arms, like a swastika, but in the latter, two of the arms have changed places. Note also, that in addition to the fundamental difference in shape between the two diagrams, the *Ho T'u* has at its center a 10 (formed by the two extra fives) along with the original 5, which gave a second number to the element Earth. However, various literary

[62] The *Wu-hsing ta-yi*, I, 2.24, cites an otherwise lost passage from the original *Po Hu T'ung*, supposedly dating from the first century A.D., explaining the cycle of elements according to the *Ho T'u* order. To condense this, it says that Wood gives birth to Fire by internal heat, such as is released by a fire-drill; Fire gives birth to Earth by producing ashes; Earth gives birth to Metal when ore is melted from rocks. The explanation of how Metal gives birth to Water is most vague but ends with the remark that molten metal is also liquid! The only reasonably sensible statement is that Water gives birth to Wood by nourishing plants.

[63] This worthy was the legendary Fu Hsi (traditionally, 2852–2736 B.C.). As popular myth ascribed him to an earlier age than King Yü, we get the strong impression that a later school was seeking the prestige of a more remote origin for what was actually a later invention. It is usually stated that the *Ho T'u* diagram was delivered to him by a "dragon horse" (*lung ma*), which later tradition interpreted as a *ch'i-lin;* but a parallel old tradition said it was simply a dragon, hence the expression here.

references indicate that the Old Chinese generally assigned 10 as well as 5 to the element Earth,[64] so this number might also have been represented at the center of the *Lo Shu* in its numerical form. At first thought, it might seem that it would have been almost impossible to add 10 to the center of the *Lo Shu*, since the space was already occupied by the 5. However, awkward as it would be to do this with our Western system of numbering, it would have presented no real problem in Old China to have represented the two numbers together at the center of either diagram. As mentioned above, in Han times and earlier, their 5 was written like an X, while they wrote 10 like a Greek cross (with equal arms), so that the cross superimposed on the X would have formed a star-shaped device, pointing outward in the eight directions, accenting still more the concept of the Center as a radiant force which extended its influence to all the other parts of the universe.[65]

A fuller comparison of the diagrams of the two divergent schools, considering more deeply the differing symbolic traditions, and the associated symbols that clustered around each,[66] would doubtless carry us too far afield. We have cited the *Ho T'u* here primarily because the two plans were so often confused for each other; in fact, as previously mentioned, even otherwise-responsible Chinese scholars frequently exchanged the two names.[67] However, the *Lo Shu* proper was incomparably more effective as a depiction of the order of the universe, not only because of the more equitable balance of its numbers but also because of its ability to represent—through the natural permutations

[64] An oft-quoted passage from the "Book of Changes" says: "Heaven's 1, Earth's 2; Heaven's 3, Earth's 4; Heaven's 5, Earth's 6; Heaven's 7, Earth's 8; Heaven's 9, Earth's 10" (see the *Chou I* [*Szŭ-pu pei-yao* ed.], 9.8*b*, or the *Ch'ien-Han shu*, 21*a*.18). This quotation is often cited as an illustration of the belief that the cosmic plan must have ten numbers to be complete. This doctrine is applied to the Five Elements in the *Wu-hsing ta-yi*, I, 1.9.

[65] This added 10 is discussed further in Sec. 5 and at the beginning of Sec. 6.

[66] In the Han dynasty and later, these two numerical plans each served as the nucleus for a complex tradition. Where the *Lo Shu* had the *Hung Fan* document, the *Ho T'u* had the *Yüeh Ling*. Each served as the basis for a separate theory regarding the layout of the Ming T'ang. Each was associated with a different arrangement of the Eight Trigrams: the *Lo Shu* with the arrangement ascribed to King Wên of the Chou dynasty, and that of the *Ho T'u* again ascribed to the legendary Fu Hsi. On this subject see Granet, *La Pensée chinoise* (Paris, 1922), pp. 179–80, where he contrasts the two views regarding the arrangement of the Ming T'ang, and *ibid.*, pp. 185–86, and *passim*, discussing the two sets of trigrams.

[67] The Sung philosopher Chu Hsi (1130–1200) in his edition of the *I Ching*, *Chou I*, chap. 1, pp. 1*b*–2, quotes Ts'ai Yüan-ting, one of his contemporaries, as saying that the two plans had been confused since the time of Liu Mu (late tenth or early eleventh century), and he himself presented the correct one. Meanwhile Chou Chên (1072–1138), in his *Chou-i-kua-t'u* (preserved in the *T'ung-chih-t'ang ching-chieh*), 1.2, after presenting a picture of the *Lo Shu* labeled as the *Ho T'u*, lists a number of other scholars in the line of transmission between Liu Mu and himself (writing in 1134), all of whom had committed the same error of exchanging the names.

of these numbers—the cycles of the Yin and Yang and the Four Seasons, as well as those of the Five Elements, etc., within one simple plan. Indeed, the *Lo Shu* was one of the best representations of the universe in microcosm conceived by the Old Chinese; for, in the harmonious balance of its numbers around the strong central number, it so neatly symbolized all Nature with its diverse constituents in a state of ideal harmony around a vital axis, or, on a lesser plane, the world of men at peace around a powerful sovereign.

5. THE "LO SHU" AND THE CULT OF T'AI-YI

The concept of earthly Centrality was also projected upward to apply to high Heaven as well, especially in the Han cult of T'ai-Yi, where we find the *Lo Shu* entering even more directly into Old Chinese religion.

In Old China the expression *T'ai-Yi*, meaning "The Great One" or "The Supreme Unity," was written in several different ways, because each of the two syllables had two alternative characters,[68] and, regardless of how it was written, it might be used in either of two basic meanings. Sometimes the term served as an alternative name for the Tao, in recognition of its supremacy and its oneness, but more often it was the name of a specific divinity.[69] We have seen that the Tao or "Way of the Universe" was expressed in the workings of the *Lo Shu*, and now we shall see that T'ai-Yi the divinity was also intimately connected with this diagram.

The god T'ai-Yi rather suddenly appears in Han imperial worship at the time of Emperor Wu, whom we previously discussed as being concerned with the concept of Centrality. The Han records state that after Wu Ti came to the throne in 140 B.C., he regularly conducted the usual sacrifices to Heaven and to Earth, to the Five Emperors (legendary rulers representing the Five Elements), and to the Sun and the Moon (for Yang and Yin), in order to insure the orderly regularity of the universal process; but in 124 B.C. he was persuaded to adopt, in addition, the cult of T'ai-Yi.[70] At first this was merely an additional form of worship, using a separate shrine, but in 113 B.C., having been told that the Five Emperors were only this god's aides, Emperor Wu

[68] Two of the characters were alternative forms for *t'ai* (Giles' *Dictionary*, Nos. 10,573 and 10,596); the second two were the characters for *yi* (or *i*) meaning "one" (Giles, No. 5342) and that meaning "monad" (Giles, No. 5341). This permitted four possible combinations of characters for writing the god's name. Rarely, *ta* was used instead of *t'ai* (see ref. in n. 69), making two more possible variations.

[69] Both interpretations apparently go back to the Warring States Period. The *Chuang-tzŭ*, 21.24, refers to T'ai-Yi (as Ta Yi) in the first sense, and one of the "Nine Songs" in the *Ch'u-tz'ŭ* refers to "Tung-huang T'ai-yi" who is obviously a celestial deity.

[70] *Shih-chi*, 28.18, 22, and *Ch'ien-Han shu*, 25*a*.21*b*. (Hereafter, the former work will be abbreviated as *SC* and the latter as *CHS*, for convenience.)

displaced from the central location in the imperial rites the Yellow Emperor (Huang Ti), who represented the Center among the Five Directions, in order to give T'ai-Yi the focal position in the state worship.[71] Thereafter, Emperor Wu himself, dressed in robes of purple, offered sacrifice to T'ai-Yi, in the Ming T'ang and elsewhere, upon a special altar; the latter is described as being built in three tiers and having on it eight "spirit paths."[72]

Although we read that pictures of T'ai-Yi and other divinities were painted in the Kan-ch'üan Palace in 120 B.C.,[73] we do not know exactly how they thought he looked in that period;[74] but, regardless of the precise visual conception of him, his status was quite evident. T'ai-Yi was the Sky Emperor, and he dwelt in a palace at the center of Heaven, at the point marked by the Pole Star.[75] From there, at the top of the *axis mundi*, he ruled the eight outer divisions of Heaven—just as the Chinese Emperor, who lived at the bottom of the cosmic axis, at the center of the Earth, extended his influence out in the eight directions below.[76]

[71] *SC*, 28.23*b*; *CHS*, 25*a*.23 and 23*b*.

[72] This altar has been fantastically described by such people as Chavannes (*Mémoires historiques*, III, 502) as having eight openings, because they failed to comprehend the reference to the "right spirit paths" (*t'ung-kuei tao*, or *shên tao*). In the pages that follow we shall see ample evidence to suggest that these "spirit paths" which played such a large part in the cult of T'ai-Yi were probably only eight grooves cut into the upper surface of the altar. The altar's original specifications are mentioned in *SC*, 28.23*b*, and in *CHS*, 25*a*.16*b* and 23*a*.

[73] *SC*, 28.24, and *CHS*, 25*a*.17, both describe how they erected a "terrace room" in the center of the Kan-ch'üan Palace, in which Shao Wêng painted "Heaven and Earth (as separate deities), T'ai-Yi, and all the (lesser) gods and spirits."

[74] Presumably T'ai-Yi was considered as having a human form, because a legend tells how the spirit of T'ai-Yi is supposed to have appeared to Liu Hsiang (B.C. 80–9 A.D.) to inspire him in his writing, coming as a venerable old man in a yellow robe (see H. A. Giles, *Chinese Biographical Dictionary* [London and Shanghai, 1898], 501–2). A Taoist text of uncertain date, but undoubtedly post-Han, described T'ai-Yi as having the body of a resplendent bird with a human head, wearing a robe of black and yellow pearls; this is the *San-tung ching*, quoted by Chang Chun-fang, *Yün-chi ch'i-ch'ien* (*Szŭ-pu ts'ung-k'an* ed.), p. 132, bottom. In his late form as a disperser of evil he is purely anthropomorphic, and is shown as an ancient sage holding a scepter. See Ku Chieh-kang and Yang Hsiang-k'uei, *San-huang k'ao* (Yenching Journal of Chinese Studies, Monograph VIII [Peiping, 1936]), p. 154, for a picture of an image of him in a modern Peking temple.

[75] This palace was given various names, all beginning with the word "Purple," as this color was habitually associated with the cult of T'ai-Yi. For one of the numerous descriptions of it see the *Ku wei-shu* (*Ts'ung-shu chi-ch'êng* ed.), 8.16*b*. *SC*, 27.1, and *CHS*, 26.1*b*, both state that the Pole Star was T'ai-Yi's permanent residence, then go on to describe the Purple Palace (*Tz'ŭ Kung*) as a larger group of stars around it; however, we can be sure that most people in Han times thought of this palace as a literal structure. They accounted for the fact that it was not directly overhead by a legend describing how the world-axis had been struck and bent by a monster in ancient times.

[76] For the recognized parallelism between the Supreme Sky-god and the Emperor see L. de Saussure, "Les Origines de l'astronomie chinoise," *T'oung Pao*, Ser. 2, X, 262 ff. This inevitably recalls old Near Eastern concepts of kingship.

This assumption of a connection between the first power in Heaven and the chief sovereign on earth must have been especially agreeable to Emperor Wu. As the unchallenged ruler of the Chinese Empire, which now seemed permanently established as a strong, centralized power, with his armies marching under the banner of T'ai-Yi[77] constantly adding new territories to his realm, he was very conscious of his own might, and quite susceptible to flattery.

Although the worship of T'ai-Yi is generally recognized as having been introduced into the imperial rites in Emperor Wu's time, it is still possible that this may have represented the reintroduction of an older cult; because literary references to T'ai-Yi as a powerful deity go back as far as the fourth century B.C.[78] Furthermore, when the worship of T'ai-Yi was suggested to Emperor Wu by the sage Mu Chi (who came from the district where Tsou Yen had once lived, still noted for its occult interests), he proposed it as the re-establishment of an old state cult that had lapsed into disuse.[79] This could have been merely an appeal to bogus tradition, to give the prestige of authority to a new idea, if it were not for other circumstances involved. Such a religion would inevitably have appealed to Ch'in Shih Huang-ti for the same reasons that it did to Emperor Wu, and, although we have very little information about the Ch'in imperial rites, we do know that they involved the worship of only four of the Five Emperors, suggesting that there may have been a previous displacement of the fifth from the central position for this purpose.[80] If so, T'ai-Yi may have been publicly worshiped a century earlier.

However, even in the time of Wu Ti, T'ai-Yi was not considered to be uniquely powerful. He was still "The Great One" rather than "The Supreme Unity," for Heaven and Earth continued to receive separate worship. The latter two, as deities, were called "T'ien-Yi" and "Ti-Yi" respectively, and with T'ai-Yi the trio was known as the "Three Ones" (*San Yi*).[81] In this grouping T'ai-Yi seems to have been consid-

[77] The banner is described in *SC*, 28.24, and *CHS*, 25*a*.24. To symbolize the Sky-god and his domain, it portrayed the Sun and the Moon, the Big Dipper, and an ascending dragon.

[78] See n. 69, above.

[79] *SC*, 28.18, and *CHS*, 25*a*. 16*b*.

[80] *SC*, 28.13–13*b*, describes how, in 215 B.C., Kao Tsu, the first Han emperor, inquired about the religion of the Ch'in dynasty, which he had been helping to overthrow, and was told that they sacrificed to the Four Emperors: White, Blue, Yellow, and Red. Whereupon he ordered that a shrine be erected for the Black Emperor, to complete the set of five.

[81] Some of the later Taoist treatises on the San Yi, attempting to explain how three deities were basically one, recall Western arguments regarding the doctrine of the Trinity. Cf. the *Yün-chi ch'i-ch'ien*, chap. 49.

ered as lord of the celestial bodies which traveled around between heaven and earth, as well as being lord of the axis which united earth with heaven. Hence he was the Ruler of the Center *par excellence.*

It was not until the reign of the usurper Wang Mang, which began in 7 A.D., that T'ai-Yi was raised to absolute power as "The Emperor of Heaven," with the impressive title *Huang-t'ien Shang-ti T'ai-Yi.*[82] Then he was indeed "The Supreme Unity." Probably it was about that time that someone conceived the idea that the Sky Emperor had obligations similar to those of the earthly emperor, including an annual ceremonial progress to inspect his realm; although this might have developed earlier.

The first allusion to this concept appears in a cryptic-sounding passage in one of the *wei* books, and its accompanying commentary. The text proper mentions that T'ai-Yi selected his numbers by circulating (among) the Nine Palace Halls,[83] and this rather laconic statement was elaborated in some detail by a Later Han scholar, Chêng Hsüan, in the second century A.D. He explained that T'ai-Yi had nine palaces —one in each of the eight directions as well as his principal one in the center of the sky—and that he visited each in succession.[84] The eight outer palaces were each named after one of the Eight Trigrams, which were linear figures each composed of three whole or broken lines, considered as symbols of the Eight Winds in the eight directions of heaven.[85] If we replace each palace with the direction that its trigram symbolized (in the order of the trigrams ascribed to King Wên[86]), we can trace the god's itinerary.

Leaving his palace at the Center, the Supreme Unity first visited the North one, then the Southwest, the East, and the Southeast; after

[82] This title is discussed in Ku and Yang, *San-huang k'ao,* pp. 58–59 and 131.

[83] The *I-wei ch'ien-tso-tu* (*Ts'ung-shu chi-ch'êng* ed.), 2.30. Chêng Hsüan's commentary is also quoted in the *Hou-Han shu,* 89.9*b*.

[84] The name of the lost book entitled "Classic of the Nine Halls of the Yellow Emperor," referred to in n. 20 above, might imply that the Nine Palaces, and perhaps the ritual circulation as well, could at one time have been associated with the mythical Yellow Emperor who ruled the Center before T'ai-Yi was brought into the imperial cult, and who rose to prominence again in Taoist circles after T'ai-Yi lost favor. Without having the book or knowing its exact date, we cannot know. In any case, the name of the god is less important for the understanding of the symbolism; what does matter is that, in Han, he who made the tour was recognized as the ruler of the Center.

[85] The trigram representing Heaven or pure Yang, *ch'ien,* is composed of three parallel straight lines, while the one representing Earth or pure Yin, *k'ên,* is made up of three broken lines. The remaining six trigrams exhibit intermediate combinations of whole or broken lines.

[86] Although the Chinese had two separate ways of arranging these trigrams, as explained in n. 66 above, the order ascribed to King Wên was always the one used with the Nine Halls or the *Lo Shu.*

which he went back to the Center palace to rest; then, resuming his journey, he visited the Northwest, West, Northeast, and South palaces, finally returning again to the Center. If you follow out this route on a piece of paper marked with the compass points, numbering each step, you will find that his progress exactly traced out the positions of the numbers on the *Lo Shu* pattern.[87] This is why Chêng Hsüan also referred to the numbers in the *Lo Shu* as the "Celestial Numbers of the Nine Halls."[88] He also explains that the eight outer palaces belonged alternately to the Yang and to the Yin, so the visits of T'ai-Yi were evenly distributed between Yin and Yang, carrying out the eternal balance of the universal rhythm.[89]

That T'ai-Yi's function was essentially creative, we may gather from another "puzzling" passage in the *Lü-shih Ch'un-ch'iu* ascribed to the third century B.C. but possibly dating from Early Han. This says, "From the T'ai-Yi proceeded the Two Principles; the Two Principles produced the Yin and Yang (respectively); and in the permutations of the Yin and the Yang, one up and one down [recalling the two simultaneous cosmic cycles], were produced the 'Ten Thousand Things' (everything in the Universe), sprung from T'ai-Yi by the action of the Yin and Yang."[90]

The sense of this passage is echoed, in slightly different terms, in a parallel text from an appendix to the *I Ching*. This states, "The Great Axis (*T'ai Chi*) gave rise to the Two Principles, which gave rise to the Four Resemblances (*Szŭ Hsiang*), which in turn gave rise to the Eight Trigrams."[91] Many words have been wasted in trying to explain both statements without a key; but they become quite plausible when interpreted in the light of the *Lo Shu* or the *Ho T'u*. T'ai-Yi, or the Great Axis, was the central 5 in either plan. The paired Principles were the two extra 5's produced from the central one in the *Ho T'u*, or the latent Yin 5 with the visible Yang 5 in the *Lo Shu*, after the spontaneous doubling of the middle number.[92] The Four Resemblances were the four pairs of outer numbers, each the symbol of an element. These four pairs were "products of the Yang and Yin" because each

[87] Granet pointed out that the god's journey re-enacted the order of the *Lo Shu* (*Pensée chinoise*, pp. 186–87); but he failed to realize all the implications of this.

[88] See reference in n. 83, above.

[89] *Ibid.*

[90] *Lü-shih Ch'un-ch'iu* (*Szŭ-pu pei-yao* ed.), 5.3.

[91] *Chou-i Wang-Han-chu* (*Szŭ-pu pei-yao* ed.), 7.9*b*.

[92] Not only do the two passages quoted above imply a creative splitting or doubling of the central 5 in either plan (to make Two Principles where originally there had been only Unity), but also the Yin-Yang symbolism in the *Lo Shu* presumed two 5's at the center, as shown in Fig. 3, *b–e*.

consisted of one odd number and one even one, so they resembled each other in constitution as well as in symbolic value.[93] Finally, each of these eight numbers singly produced an equivalent trigram. (The last process is more obvious in the *Lo Shu*, which is more directly concerned with the trigrams; but the *Ho T'u* also has its own set.)

The fact that the Old Chinese must have definitely recognized an association between the Four Resemblances and the *Lo Shu*, such as we have inferred, is indicated by the pattern on the back of a bronze mirror, formerly in the Imperial Collection of the Northern Sung emperors.[94] Made in the T'ang dynasty (618–906), this had at its middle a nine-celled square, with the high mirror-boss rising from the center cell.[95] This obvious allusion to the Nine Halls or the *Lo Shu* with its highly significant Center was surrounded by an ornamental frame and four small elephants, one standing just beyond the frame on each side.[96] The only plausible reason for the presence of these animals, in an otherwise wholly geometric pattern, is that the phrase "four elephants" is also pronounced *szŭ hsiang*, making a pun on the name "Four Resemblances." (Both are pronounced the same, though each is written with a different second character.)

We now see more clearly than ever that the *Lo Shu* was considered as a universe in microcosm, a living organism with a life of its own; but it is equally obvious that we have at least two separate accounts of the origin and mode of functioning of this *imago mundi*.

In the first system, we have a simple circular course traced by the cycles of the Yin and Yang, the Elements and the Seasons, moving sedately in a clockwise fashion. Although the Yin and the Yang—with the Elements and the Seasons—were believed to have been created by

[93] Another possible explanation of the Four Resemblances in the *Lo Shu* might be the two pairs of Yin numbers and the two pairs of Yang numbers. Obviously products of the Yin and the Yang, each pair equals ten, so, not only do they resemble each other, but they also resemble the paired 5's at the center which also equal ten. (This would not apply to the *Ho T'u*.)

[94] *Po-ku t'u-lu*, 20.86.

[95] On any Chinese cosmic mirror, the mirror-boss would represent the *axis mundi*, although form and interpretation varied from type to type (see Cammann, "Significant Patterns on Chinese Bronze Mirrors," *Archives of the Chinese Art Society of America*, IX [1955], 43–62).

[96] The nine cells had no numbers; but those which would contain Yin numbers in the *Lo Shu* were engraved, and those which would have Yang numbers were left plain or in low relief. (These are characteristic ways of representing Yin and Yang in Chinese art.) The frame, set apart by a narrow plain strip, has sixteen cells, of which those in the corners and at the middle of each side are ornamented, while the eight between them hold little clouds. The ornamented cells probably indicate the places to be occupied by the Eight Trigrams, after the Four Resemblances (symbolized by the elephants) had split into eight numbers and produced the trigrams.

the Center, the motion thereafter was conceived as proceeding more or less independently of the Center, except insofar as the central element shared in the workings of the other four.

Not only did the zigzag path across the *Lo Shu* taken by the Heavenly Emperor give quite a different aspect to the second system, but also the latter definitely assumed the continual action of a divine agent who was intimately concerned with the middle number. However, within this system there were two possible interpretations of the symbolism, depending whether the middle number was considered as symbolizing a location or was the symbol of the agent himself.

As a location, the middle number served as the place from which the god T'ai-Yi started, where he paused to rest in mid-journey, and where he concluded his trip (before setting out again on a new one). Here, the center number was not only specially singled out at the beginning, middle, and end of the action; it also gained increased symbolic significance by representing the source, point of renewal, and destination in the divine activity.

On the other hand, when the middle number in the *Lo Shu* was so closely identified with T'ai-Yi that it was considered the actual symbol of the god, it became a dynamic agent in itself. Then the middle number would have been imagined as issuing forth from the Center to set down the other numbers on the outside of the square (alternately Yang and Yin ones), stopping to rest at the Center when the task was half done, then returning to the Center at the end of each journey. And from this act there developed a further process of creation; because, as the texts explicitly stated, each outer number went on to express its equivalent trigram, and the trigrams in their turn produced the "Ten Thousand Things." In this case, then, the middle number took the primary role in a periodic round of inception, creation, renewal, creation again, followed by return to the Source. Thereby, it neatly portrayed the concept of the periodic regeneration of the universe by means of the divine journey, as a simple but graphic representation of the myth of the Eternal Return.[97]

The concept of a return to the Source was not openly illustrated in the other system, which depicted the *Lo Shu* as a complex of interlocking cycles, but the remarkably adaptable plan was still quite capable of representing this idea by another means. In order to demonstrate this, we must resort to a simple mathematical operation called "casting out nines." This process requires adding the digits of any number with two or more digits—or dividing the number repeatedly by nine—

[97] See Eliade, *Myth of the Eternal Return*, for a detailed discussion of this widespread motif.

until only a single digit remains.[98] Recent research shows that the Old Chinese used this, and took advantage of special effects achieved by it, in manipulating their other magic squares;[99] so they doubtless applied it here, as well.

In the ordinary *Lo Shu* square, when one casts out nines from the total sum, the 45 reduces to 9. When this operation is performed on the larger *Lo Shu*-style squares of six,[100] the total sum of 666 reduces to 18, then to 9; and, finally, when one uses it on "the Giant *Lo Shu*" of 9×9 cells,[101] both the constant and total sums (369 and 3321) each reduces to 9; all of which may show another reason why 9, along with 5, was so revered in Ancient China. However, this is only a preliminary explanation leading up to the fact that, when the Old Chinese assumed the presence of two 5's in the *Lo Shu* (which was also implied in the cycles of Yin and Yang, as illustrated in Fig. 3, *d* and *e*), that would have changed the total sum of the *Lo Shu* from 45 to 50,[102] and, on casting out nines, this reduces to 5.[103] Since 5 was the creative, axial number from which all the other numbers were thought to be derived, according to the second text, we here return to the original source.

Now let us go back once more to the concept of the creation of the *Lo Shu* by T'ai-Yi, "The Great One." When the "Supreme Unity" circled the Nine Halls, note that the tenth step in his celestial progress, which brought him back to his palace in the Center, was equivalent to

[98] It has not previously been recognized that the Old Chinese knew this process.

[99] In my coming article, "Old Chinese Magic Squares," I hope to demonstrate that Yang Hui's second magic square of five had had its numbers deliberately augmented to produce a special effect upon casting out nines.

[100] The first of the two Old Chinese magic squares of six that have survived is depicted in Cammann, "Evolution of Magic Squares in China," p. 117, Fig. 7. To prove that this was basically only a larger *Lo Shu*, add the digits of the numbers within each of the nine blocks of four cells that make up this square; you will find that each block then contains four repetitions of the same number: the number to be found in the equivalent position in the ordinary *Lo Shu*.

[101] After the ordinary *Lo Shu*, the next earliest Chinese magic square was probably the "Giant Lo Shu," a square of eighty-one cells. (It seems possible that Tsou Yen already knew this square and was inspired thereby to suggest his eighty-one divisions of the world.) This giant square is composed of nine squares constructed in *Lo Shu* pattern, then set down in the *Lo Shu* order; and, upon casting out nines, the numbers in any one of the nine blocks will each reproduce the number in the equivalent position in the ordinary *Lo Shu*. For example, the central block will contain nine 5's. Further details regarding this square will be found in Cammann, "Evolution of Magic Squares in China" pp. 121–22, and its picture is in Fig. 9.

[102] The number 50 was highly auspicious in itself, being known as the *Ta Yen chih shu* or *Yen shu*. See the *Chou-i Wang-Han-chu*, 7.7.

[103] The Han dynasty Chinese would not have been forced to take this special step. Their number system still lacked a zero, so on their counting-boards they simply left an empty space where we would write a zero. Therefore, their 50 would have been set down as 5, a little to the left. Perhaps this natural reduction of larger numbers to a single digit first suggested to them the possibilities to be obtained in casting out nines.

placing 10 in the center of the *Lo Shu* along with the 5—a situation that we have already noted as being compatible with Chinese ideas regarding the assignment of a pair of numbers to each of the Five Elements. This added 10 would have brought the total sum of the *Lo Shu* up to 55, considered a symbol of "all the numbers of Heaven and Earth."[104] Now, on casting out nines, the sum of 55 reduces to 10, then to 1, representing the symbolic absorption of all the "ten thousand things" into an all-encompassing Unity.[105]

It scarcely seems necessary to point out that these mutually exclusive, but perhaps contemporaneously recognized, maneuvers would have provided a graphic expression of the Old Chinese beliefs—especially strong in Taoist circles but passing over into Ch'an (Zen) Buddhism—regarding a Creative Source from which all things were believed to have issued, and to which all would eventually return, in a complementary backward flowing. Thus the *Lo Shu* could also demonstrate how All, having originally sprung from the One, would return at last into the One, to find ultimate fulfilment in the unity of the Absolute.

With this mystical strain in the *Lo Shu* symbolism, we once more encounter one of those tantalizing correspondences between the Old Chinese lore of the magic square and the beliefs attributed to the Pythagoreans. First we find Diogenes Laertius quoting an earlier account of Pythagorean philosophy to say, "The Monad was the beginning of all things. From the Monad proceeds an indefinite duad; from the Monad and the indefinite duad proceed numbers, and from the numbers, signs. . . ."[106] Then, in reference to the fact that when we cast out nines from the total sums of the augmented *Lo Shu* we came back to the original numbers, we find an apt statement in the writings of an Early Renaissance European cabalist, Agrippa of Nettesheim. In a chapter of his famous work, *De Philosophia Occulta*, in which he repeatedly referred to earlier ideas ascribed to the Pythagoreans, he wrote: "The number 10 being heaped together (that is, having added the digits) returns into a Unity from whence it had its beginning, being the end and complement of all numbers."[107]

[104] The *I Ching* says this powerful number causes gods and spirits to circulate (see the *Chou-i*, 7.7).

[105] The magic square of any odd or even number—except three or any multiple of three—will always produce 1, when the digits in its total sum are added together. But, for a very long time, the Chinese probably only knew the squares of three, six, and nine; so this reduction to 1, in the altered *Lo Shu* square, must have seemed to them an awesome phenomenon.

[106] See Diogenes Laertius, *The Lives and Opinions of Eminent Philosophers*, trans. C. D. Yonge (London, 1915), p. 348.

[107] *Op. cit.*, Book II, chap. 13. For an English translation see *Three Books of*

These two Western references to similar ideas, plus the allusion to casting out nines in order to demonstrate a symbolic point, might be considered mere coincidences, were it not that we have still other correspondences which are difficult to explain. For example, we read that the Medieval Hebrew kabbalists identified the central 5 in the magic square of three with the Divine Logos and also regarded the numbers at the angles as representing the Four Elements.[108] In this connection, it would be most interesting to know whether Rabbi Abraham ben Ezra, the scholar-genius of twelfth-century Spain who first described the magic square of three in the West, or any of his number-minded followers, may also have thought in terms of two 5's at the center of the square: perhaps considering the hidden, latent one as being a symbol of "the darker aspect of God."[109] In any case, the parallels already known regarding attitudes toward the magic square of three in the Old Chinese and the later Jewish world cause us to wonder whether the latter were possibly drawing from a common intermediary source, perhaps in Mesopotamia, which could have been sending out influences in both directions over many centuries;[110] or whether the Hebrew scholars were drawing upon Old Chinese ideas, transmitted from across Asia by way of the Islamic world.[111]

6. THE DECLINE OF THE "LO SHU" AND THE FALL OF T'AI-YI

Our more mathematical-minded readers have doubtless already observed that when an extra number was assumed to be present at the center of the *Lo Shu* for symbolic reasons, the diagram ceased to be a magic square from a technical point of view: unless that added number was a purely symbolic element, considered as being latent and reces-

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Occult Philosophy Written by Henry Cornelius Agrippa of Nettesheim, trans. J. F. (London, 1951), p. 211. His treatise on "ten" sounds like a weird mixture of Pythagorean ideas and doctrines from the Kabbala.

[108] See S. Karpe, *Étude sur les origines et la nature du Zohar* (Paris, 1901), p. 201.

[109] The two 5's would then have had the same relationship as the two opposed triangles that compose the *Mogen David* (see "Shield of David," in the *Universal Jewish Encyclopaedia*, IX [New York, 1942], 507).

[110] E. Wallis Budge in *Amulets and Superstitions* (London, 1930), p. 390, describing the kabbalistic magic squares used as amulets, remarks: "When and where . . . the magic squares were invented is not known, but it is almost certain that they are of Sumerian or Indian origin." Actually, Sumer would certainly be far too early, and India seems ruled out.

[111] If the early Islamic and Jewish magic squares, and some of the ideas associated with them, did possibly come from China, they could have been brought by the Arab traders who had had relations with China's coast from early in the Christian Era; or by Persians trading overland; or even by the Jewish merchants called Radhanites, who acted as traders between southern Europe and China during the Early Middle Ages and played some part in other cross-cultural exchanges (for the latter see Needham, *Science and Civilization*, III, 681–82).

sive, taking no part in the mathematical functions of the square. For, if a magic square is to keep its ability to produce the constant sum as well as other "magical" qualities, no new number can be introduced unless it be added to every number in the square, so that all are increased by the same amount.

In the case of the latent Yin 5, the required conditions were not actually broken, for that number was considered as being hidden and inactive after it had done its part in the initial work of cosmic creation; but when the 10 was placed at the center of the *Lo Shu* along with the 5, the diagram was no longer a proper magic square; even though it doubtless retained, or even increased, its supposed supernatural power as a magic charm in the minds of the credulous. The point at which the *Lo Shu* ceased to be a properly functioning magic square to become a mere mathematical diagram with alterable numbers must have marked an initial step in its descent—but the real decline was not fully reached for several hundred years.

Meanwhile, another reason for the descent of the *Lo Shu* as a symbol seems to have been that about the first century B.C. it took an increasing part in divination, since fortune-telling apparently held an important place in the cult of T'ai-Yi with which it was so closely associated. This inevitably caused a shift of emphasis, so that "practical" considerations regarding the *Lo Shu* gradually replaced the old symbolic ones.

Of the numerous kinds of implements used in Han divination, the most common seems to have been a device called a *shih*. The earliest form of *shih* was probably a square board inscribed with eight marks or grooves recalling the basic markings on a so-called "TLV" mirror, upon which counters were moved according to numbers obtained by manipulating counting-sticks.[112] A second type of *shih*, found in Later Han,[113] consisted of a square base with a circle at the center from which radiated eight straight channels in the eight directions, to serve as "spirit paths," each path being labeled with one of the trigrams, while around the edge were inscribed the twelve characters that in Han times were used to represent the zodiac. Superimposed on the circle at the center was a spinning disk containing a conventionalized

[112] These divination boards are occasionally pictured on Han stone reliefs or even on the backs of Han bronze mirrors. Modern scholars do not always agree as to when an artist intended to represent one of these or when he wished to depict a board for a game called *liu-po;* very likely the same boards may have been used for both purposes. For an illustration of such a board in use, from the Wu Liang shrine, see the *Chin-shih so*, *Shih-so*, chap. 3*b*.

[113] Parts of two such divination boards, in lacquered wood, were recovered from Han period tombs in Korea (see S. Umehara, *The Tomb of the Painted Basket*, I [Keijo (Seoul), 1934], 97, Fig. 46, and Plate 107, Fig. 1, for one of these). For a reconstruction of an entire *shih* board see Needham, *Science and Civilization*, Plate 80, facing p. 542.

sketch of the Big Dipper. Now the four main stars which form the "bowl" of the Dipper were known in Han astronomy and folklore as "the chariot of T'ai-Yi," and the three outer stars that compose the "handle" were known as "T'ai-Yi's spear."[114] In fact, it seems probable that the large divinity pictured as riding in the Big Dipper on one of the Wu Liang shrine slabs is a Later Han representation of T'ai-Yi himself.[115] With this kind of board, presumably the operator turned the upper disk in some prescribed manner to see to what sign the Dipper's handle ("T'ai-Yi's spear") would point, and then made his prognostications. Being so obviously connected with the T'ai-Yi cult, this method of reckoning may have constituted the "T'ai-Yi calculation" described by Hsü Yo as having been based upon "T'ai-Yi's travels going and coming on the eight paths."[116]

Another kind of divination board or chart seems to have borne the pattern of the *Lo Shu* or one of the larger magic squares derived from it, and this kind seems to have been used in Hsü Yo's "Nine Halls calculation."[117] Chang Hêng, a noted mathematician of the Later Han (died A.D. 139), is specially cited as having advocated divination by magic squares, and he is quoted as saying that this form of divination was already very old in his day.[118] The exact method of selecting the numbers on such a board is not known; perhaps it was again done by counting-sticks which determined the moves of the pebbles or other counters.[119] Then, when a number had once been determined, the fact that the outer numbers of the *Lo Shu* and the trigrams were interchangeable would have enabled the diviner to consult the prognostications for the related trigram in various standard books on divination, such as the *wei* books or the appendixes to the *I Ching*.[120]

[114] *SC*, 27.3, and *CHS*, 26.2. These two chapters on Han astrology, if carefully studied, should provide the information required for understanding how these *shih* boards were supposed to function.

[115] Illustrated in the *Chin-shih so*, *Shih-so*, ch. 3*b*.

[116] Hsü Yo, *Su-shu chi-i*, p. 7*b*.

[117] The use of paper for divination boards would explain why they have not survived in the quantity one might expect from the frequent mention of them. Incidentally, the early invention of paper in China would probably also explain why the Chinese led the world in the early development of magic squares, since the Chinese scholars had a cheap medium on which to experiment with their figuring.

[118] See his biography in the *Hou-Han shu*, 89.9 ff.

[119] The *Sui shu* catalogue of earlier books lists two, namely, the *Chiu-kung hsing-chi ching* ("Classic of the Moving Counters in the Nine Halls") and the *Chiu-kung hsing-chi fa* ("Method of Moving the Counters in the Nine Halls") along with a number of other books on divination, several of which have "Nine Halls" in the title. See also n. 129, below.

[120] Although Hsü Yo lists "Calculation by the Eight Trigrams" (*pa-kua suan*) as a separate form of divination (*Su-shu chi-i*, p. 6*b*), such sources as the *Wu-hsing ta-yi*, ch. 1, p. 22, make it clear that the trigrams were interchangeable with the outer numbers of the *Lo Shu* or Nine Halls.

Still another form of Han divination employed a primitive compass. Probably this was specially used for a particular kind of prognostication: the pseudo-science called geomancy, known in China as *fêng-shui*, which was relied on to determine in advance a propitious location for any new building, temple complex, town, or tomb site. The earliest examples of the diviner's compass, recently recovered from Later Han graves,[121] consisted of a square bronze plaque with a polished circular depression in its center, from which radiated eight grooves or channels ("spirit paths"), each marked with a trigram; and, like the second form of *shih*, it also bore the characters for the Chinese zodiac, to add the dimension of time to the calculations. In the smooth center was placed a small scoop or dipper of magnetic iron—obviously another means of representing the Big Dipper—and this was capable of spinning, handle outward, until the tip of the handle pointed toward the sign for South.[122] After this, the other marks were probably lined up with various distinctive landmarks to determine the extent of their influence for good or ill.

Apparently, the Han divination boards were also used on occasion in magic rituals. We infer this from an extreme example of reliance on the cult of T'ai-Yi and the concept of Centrality. In A.D. 23 Wang Mang, the usurper who had caused the downfall of the Former Han some fourteen years before and had elevated T'ai-Yi to supreme rank, realized that his enemies were closing in upon him. Instead of taking refuge in flight, he put on a purple robe and went to a pavilion that seems to have had some special cosmic significance. There he seated himself with a *shih* board in his lap, watching the handle of the Dipper and attempting to establish himself symbolically at the base of the cosmic axis, vainly trusting that he would thus be safe under divine protection. An enemy tracked him there and killed him.[123] Wang Mang's fatal error lay in taking too literally the idea of the quest for the Center. Like so many others of his time, he considered the latter as a physical situation conferring special power, rather than a mental and spiritual condition that could bring new strength through integration.

His enemies established the Later Han dynasty in A.D 25, and, after an initial period of prosperity, that, too, suffered a series of disasters,

[121] See Wang Chên-to, "Discovery and Application of Magnetic Phenomena in Ancient China," Part I, *The Chinese Journal of Archaeology*, No. 3 (Shanghai, 1948), pp. 119–259, especially Plate 31.

[122] In accordance with the usual Chinese convention regarding maps, plans, etc., the operator of this compass would have held it with the symbol for South at the top and then would have turned himself until the tip of the handle pointed away from him, toward that symbol.

[123] *CHS*, 99*c*.25*b*–26.

leading to its collapse in 220. The final fall of Han was followed by a succession of petty kingdoms whose unsuccessful struggles for domination lasted more than three centuries, through the periods known as the Three Kingdoms and the Six Dynasties (221–589). With the prolonged disunity, it must have seemed that the ordered centrality of the universe had completely disintegrated. In these dark ages, the loss of authority and attendant chaos brought doubt and uncertainty, leading to a heavy sense of the power of fate in human life. The dread of disaster could be countered in two ways: either by putting faith in Buddhism—then making its first extensive gains in China—or else by relying still more on divination, in an attempt to anticipate and forestall personal ill fortune. The pessimism of the times as well as a changing attitude toward T'ai-Yi are revealed in such remarks as this: "T'ai-Yi knows winds and rain, floods and drought, wars and rebellions, famine and want, plague and pestilence."[124] In short, his status had gradually changed; from Supreme Sky-god, victorious in battles, he was now a foreteller of doom, warning people through divination to expect dire calamities.

China finally regained unity under the short-lived Sui dynasty (589–618). The second emperor of Sui, Yang Ti, was an ardent Confucian and a believer in orthodoxy, so in 605 he ordered the destruction of the *wei* books and other occult writings, on the ground that they too often ascribed to Confucius the sayings of lesser men of later times in order to gain the prestige of the sage for new and dubious ideas.[125] Thus most of the old writings about the *Lo Shu* and its role in early divination were destroyed.

It does not seem likely that the old *Lo Shu* tradition and the former means of divination could have been so completely wiped out if many people still had much faith in them. Probably they had already begun to be discredited. It seems inevitable that overreliance on the *Lo Shu* as a protective charm and as a magical means of divination would eventually have ended in its degradation. Disillusion always comes sooner or later when people make the mistake of confusing a symbol of the Ultimate with the Ultimate itself. The *Lo Shu* was only a symbol of the universe under T'ai-Yi and the Tao, pointing beyond itself to the inexpressible. It was not itself the Supreme Sky-god, and when it was treated as sharing in supernatural powers, it was bound to disappoint those who put too much faith in it. Thus, when a *Lo Shu* charm failed to give protection at a moment of danger, or when later

[124] See the *Chin shu*, 11.8.

[125] This was only the last of a series of purges directed against the occult writings that had begun back in the Six Dynasties Period (see Bruce, "The *I Wei*," p. 103).

events showed that a divination board had provided too many inaccurate predictions regarding the course of fate, the former high regard for them must have gradually crumbled, with a corresponding loss of prestige for T'ai-Yi, whose powers they had shared.

Before the close of the Six Dynasties Period, T'ai-Yi had been demoted to the status of only one among a group of nine star-gods, all of which were believed to be circulating amid the Nine Halls.[126] During the T'ang dynasty, in the year 744, the Taoist-minded court incorporated into the imperial rites of T'ang a cult for their worship.[127] This involved a "Nine-Halls Altar" (*Chiu Kung T'an*), consisting of a terrace on which rested nine small daïses or "thrones," each representing a station in the sky. From the numbers assigned to each god and the deployment of their respective thrones, we can tell that the latter were initially set out on the terrace in accordance with the plan of the *Lo Shu;* but the gods did not remain in those places, for the heavenly circulation was re-enacted upon the altar, at least until the year 760.[128]

For example, the men of T'ang thought that it took T'ai-Yi nine years to make his full tour, remaining in each of the Nine Halls for a full year, and that he moved with his number (1) and his special color (white) from palace to palace, following the *Lo Shu* order. But each time he moved, the other eight gods, each with his own number and color, also pushed forward one step, so that they, too, each occupied all the nine palaces in regular succession. Because of all this moving around, the individual seats were referred to as "flying thrones" (*fei wei*).

As long as this system was taken seriously, eight other nine-cell squares were produced for the second to ninth years of each nine-year cycle. But these eight other diagrams were not magic squares in any technical sense, for the change in arrangement of the sequence—especially the displacement of the 5 from the center as its particular star-god moved it around—made it impossible for them to reproduce a constant sum. Nevertheless, these were still magic squares in another sense, for they were put to magical use in astrology, in an elaborate calendar system intended to determine lucky and unlucky days.[129]

[126] See n. 129, below.

[127] The T'ang cult at the Nine Halls Altar is discussed in the *T'ang hui-yao*, 10*b*.17–23.

[128] After 760, we are told, they did not change their thrones.

[129] Sir Aurel Stein found at Tun-huang a manuscript containing a calendar based on the Nine Halls, the title of which also referred to moving chessmen, so perhaps the "flying thrones" were figured on counters like Chinese chessmen. I have not yet been able to examine this manuscript, which is now in the British Museum (Stein Collection, No. 6164). It is referred to in Needham, *Science and Civilization*, III, 542. This calendar is said to have been introduced by Li Yeh-hsing in A.D. 548, which means that it must have been devised in the Six Dynasties Period, considerably before the T'ang.

These rites, and the calendars for divination, all seem to have passed out of regular use in China with the end of the T'ang. However, the nine-year cycle of calendars has persisted into modern times in Japan,[130] while the Tibetans, until recently, were still using the nine diagrams as one of their principal forms of divination.[131]

One final sacrifice on the Nine-Halls Altar at T'ai Shan took place during the Early Sung dynasty, but that seems to have been merely an isolated incident. In 1008 Emperor Chên Tsung, induced by a delegation of tradition-minded scholars to revive the former cycle of sacrifices at the Eastern Sacred Mountain, found the old T'ang altar and proceeded to use it,[132] but as far as we know that particular ceremony was not repeated.

Meanwhile, T'ang records report that the imperial court also practiced divination by three kinds of *shih*, one of which was called the *T'ai-Yi shih;* but this is not explained, except for a statement that it was forbidden to the people.[133] This is the last public mention of the connection between T'ai-Yi and divination. Even before the end of T'ang, old styles of divination seem to have given way to new forms of fortune-telling based upon astrological methods imported from Persia and India,[134] and to these the Sung scholars added renewed antiquarian interest in the sixty-four hexagrams of the *I Ching*. No longer linked with official divination, and apparently having lost any connection with the Nine Halls or *Lo Shu*, T'ai-Yi after the T'ang continued to serve as the object of various minor Taoist cults down

[130] In Japan this system is called "The Nine Stars," *Kyūsei* (see Bernard Frank, "Kata-imi et Kata-tagae," *Bulletin de la Maison Franco-japonaise*, N.S., V, Nos. 2–4, 174–185). The system was known in Japan as early as the twelfth century A.D. (*ibid.*, pp. 182–83), and it still figures in Japanese astrological almanacs (*ibid.*, p. 184).

[131] A very clumsy attempt to explain Tibetan divination by the nine variations on the *Lo Shu* pattern (expressed in Tibetan numerals) was given by Emil Schlagintweit, *The Buddhism of Tibet* (London, 1863), pp. 309–10. In his discussion of the Tibetan survival of the *Lo Shu* diagram and related symbol systems, he consistently lists the directions upside down. (Ironically, on p. 307, n. 2, he criticizes Pallas for citing the wrong directions in a previous work, claiming to have set them right himself by means of a compass; but he was working with a European compass and did not realize that these Asian plans put South at the top!) While the Tibetans still represent the *Lo Shu* on a turtle, they show a misunderstanding of the Old Chinese tale, by depicting it on the turtle's stomach instead of on his back.

[132] *Sung shih*, 104.1*b* ff.

[133] *Ta T'ang liu-tien*, 14.22*b*.

[134] The new trend in divination by means of foreign astrological methods is epitomized in the extensive work by Gotamsidda (or Gautama Siddhartha), under his Chinese name, Ch'ü-tan Hsi-ta, the *K'ai-yüan chang-ching* of 729. With this trend, the twenty-eight constellations began to appear on mirror backs, compass dials, etc. Also, there was increased stress on the signs of the zodiac, now regularly depicted by twelve animals—instead of characters—except on the compass dials.

into the Ming dynasty,[135] and by modern times he had degenerated into one of the lesser figures in the immense pantheon of popular Taoism.[136]

7. ULTIMATE FATE OF THE "LO SHU"

The *Lo Shu* as a comprehensive symbol did not long survive its parting with the religion of T'ai-Yi. During the T'ang dynasty, China was once more well unified under a smoothly working administrative system, so Centrality was taken for granted, and the concept of this as an ideal aspect of the universal plan lost all significance. Other changes in thinking led to a revised world view which held that Heaven and the Tao were less directly involved in the workings of the universe, since the secondary principles—Yin and Yang—were completely self-operating. Thus the *Lo Shu* as a symbol probably ceased to be much more than a representation of the harmonious relationship of the Yin and Yang, as expressed in the balanced pairs of odd and even digits around the middle number.

The numerical *Lo Shu* apparently died out as a symbol sometime before 900, and early in the tenth century it was entirely replaced by a dotted one. This is supposed to have been first published by the Taoist sage Ch'ên T'uan (*ca.* 906–989).[137] Whether he invented this, or whether it was really an alternative form in which the *Lo Shu* had been passed down, we do not know. In any case, the complete substitution of this for the numerical one would doubtless have been impossible if the latter had retained any strong symbolic appeal of its own. The stylized form (as pictured in Fig. 1) represented each of the original digits by the same number of small circles: white ones for the even numbers and black for the odd, as though to stress the contrast of Yin and Yang, which was probably all that people still remembered from the old symbolism.

In this stylized rendering of the *Lo Shu*, the circles linked by thin lines were supposed to represent the knots on cords used in ancient calculations, and this lent an air of antiquity to what may have ac-

[135] The gradual descent of T'ai-Yi is discussed by Fr. Henri Doré, *Recherches sur les superstitions en Chine*, Part II, IX ("Variétés sinologiques," No. 48 [Shanghai, 1915]), 557–62.

[136] T'ai-Yi was still figured among the gods on paper charms in the first half of the twentieth century (see C. B. Day, *Chinese Peasant Cults* [Shanghai, 1940], pp. 46–165).

[137] The line of transmission from Ch'ên T'uan is briefly mentioned in Fung Yu-lan, *Chinese Philosophy*, II, 453. As mentioned in n. 4, some modern writers have assumed that he, or a contemporary, invented the *Lo Shu* instead of merely publicizing it in dotted form. It is barely possible that the dotted form itself was very old, being the "Bead Calculation" (*Chu suan*) mentioned by Hsü Yo, *Su-shu chi-i*, 6*b*.

tually been a new diagram. Indeed the dotted form of the *Lo Shu* was a characteristic expression of the antiquarian spirit that prevailed in the period of nostalgic reverence for the past which followed the loss of vigor after the middle of the T'ang, and this continued on through the Sung (960–1280). During this time the thoughts of the scholars were largely turned back to past dynasties, seeking out the ideas of dead sages and trying to reconcile in one coherent system the often-discrepant views of the old philosophers and religious teachers. Although the archaic-looking dotted *Lo Shu* was just as typical of that period as were the "Han jades" and "Chou bronzes" then being forged in such quantities, it was still a highly artificial-seeming device and was apparently confined to Taoist groups or scholarly circles, so it never took hold in the popular mind to become a real symbol.

Then, too, sometime in the Sung, a new Yin-Yang symbol appeared, to take over the sole remaining symbolic function of the *Lo Shu*. Essentially, this consisted of a circle cut in two by an S-shaped line. When drawing or printing it, they showed one half light for Yang and the other half dark for Yin; but when painting, they used red for the Yang side and black for the Yin. (In either case, they usually placed a dot of the opposing color at the broadest point of each comma-shaped component to indicate the small amount of the opposing principle still present in each.)[138] The new symbol was also intended to represent the workings of the Tao through the actions of the Yin and Yang, as the *Lo Shu* had once done; but the new device was so much more obvious that it immediately found favor as a symbol, and it retained its popularity down to modern times.[139]

After early Sung, with the *Lo Shu* no longer regularly used in divination, replaced as a symbol, and presented in a rather unappealing guise, people forgot almost all its original functions. Beyond the fact that it could produce the sum of fifteen in several different ways, its distinctive mathematical properties were no longer recognized; most of its old meanings were lost; and with the numbers themselves obscured by the dotted presentation, the diagram took on the aspect of a

[138] The new Yin-Yang symbol was often depicted surrounded by the Eight Trigrams. Probably it was partly because of its use at the center of such plans of the universe that it came to be called the "*T'ai-chi T'u*" ("Picture of the Great Axis"), a term that had previously been applied to other patterns.

[139] This late Yin-Yang symbol was one of the simplest and most dynamic examples of the *coincidentia oppositorum*, which has been the basis for so many symbols of Deity or the universe (see Eliade, "Methodological Remarks on the Study of Religious Symbolism," p. 102). As such, it invites comparison with the Shield of David, for the two opposed triangles joining to form the six-pointed star correspond to the two contrasting comma-shapes united to make the circle, and both emblems were separately interpreted as representing the dual aspect of the Universal Power.

riddle. Classical-minded antiquarians indulged in a considerable amount of arid speculation about its past meaning—along with that of the *Ho T'u*, which now was also exhibited as a pattern of black and white dots—without achieving any real understanding of its former psychological appeal or any true conception of its possible deeper significance.

Only in the esoteric Taoist works preserved in the Ming edition of the Taoist canon can we find any definite remains of the *Lo Shu* tradition.[140] Most of these contain long and detailed philosophical interpretations of the *Lo Shu* by various Sung philosophers, several of whom confused it with the *Ho T'u*, referring to each under the opposite name. However, we also find some interesting survivals, as well as a few late developments. Thus, one book shows a representation of

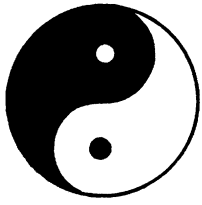

FIG. 6.—The recent Yin-Yang symbol

the nine bronze cauldrons which were traditionally the ancient symbols of sovereignty over the Nine Provinces, each of the vessels being identified by the name of an old province and by a number of the *Lo Shu*, the whole set displayed in three rows, in the following order: 4, 9, 2; 3, 5, 7; 8, 1, 6.[141]

Again, among the many depictions of Taoist magic charms, we find numerous zigzag figures based on a continuous set of lines linking nine circles. Whether the circles are labeled with numbers or symbols, or left plain, it is easy to recognize these as representing a journey through the Nine Halls. However, one marked difference sets these apart from the old Han diagram of the celestial travels of T'ai-Yi. The journey no longer begins and ends at the center; it starts at the first circle or dot (at top, or bottom, center) and ends at the ninth one, at the middle of the opposite side.

[140] The Ming edition of the *Tao Tsang*, or Taoist Canon, seems to have been based on what remained of the Taoist literature of the Sung period after it had been largely destroyed by orders of Khubilai Khan in the thirteenth century. Printed in the fifteenth century, only one complete copy appears to have survived. Kept in the White Cloud Temple in Peking, this was reprinted by the Commercial Press in 1,120 small volumes, Shanghai, 1924–26. The following references are to this edition.

[141] *Ibid.*, *Chêng-i pu*, *Shang-ch'ing ling-pao ta-fa*, 12.9.

The loss of the old concept of Centrality is not the only innovation. We also see that the medieval Taoists—probably through long familiarity with the circulation in the Nine Halls—had learned to set out the numbers in continuous succession, instead of having to write the numbers in a diamond and exchange the opposite pairs. As one result of discovering this technique, we find that they were no longer limited to two variations of the magic square of three, but they could now write it in four different ways. Thus, a set of charms for the Four Seasons shows the Winter diagram beginning at bottom center, the Spring one at left center, the Summer one at top center, and the Autumn one at right center.[142]

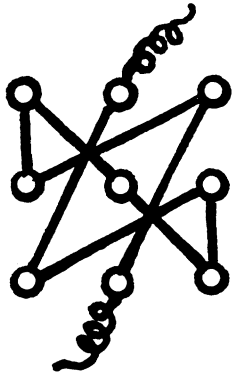

FIG. 7.—Later Taoist magic charm (from the *Tao Tsang*)

The same zigzag figure is also shown in later Taoist diagrams outlining the procedure of various rituals, with detailed instructions telling how to pace out the pattern from point to point, often accompanied by meaningless-sounding spells and incantations, to be recited while taking the steps. One Sung diagram, in a Taoist work of 1016, is so explicit as to include tiny pictures of footprints to illustrate exactly how to place the feet in advancing from one position to the next on the nine-point plan.[143] The captions or text descriptions for these ritual patterns explain that they are to be followed for various specific purposes, such as averting evil, driving off malignant demons, or for securing long life and other boons. Some of these rites were also prescribed for inducing trance or attaining ecstasy. One of the latter seems to pre-

[142] *Ibid.*, *Tao-fa hui-yuan*, 94.7*a*, 98.14 (two similar sets). Note that the Winter plan was the old Yang diagram, since the Yang begins at midwinter with the height of Yin; while the Summer plan was the old Yin diagram, for the opposite reason.

[143] *Ibid.*, *T'ai-shang chu-kuo chiu-min tsung-chên mi-yao*, 8.10*b*.

serve a trace of the old cult of Centrality, even though the diagram does not begin and end at the center; for a short inscription on it notes that, upon reaching the mid-point of the pattern, the officiant will experience golden splendor (*chin kuang*), and the sun, vegetation, and even the body, will not be visible.[144] Another similar rite for the attainment of "long life and lasting happiness" is entitled "the Paces of Yü,"[145] as though it was assumed that this legendary earthly ruler, and not T'ai-Yi, first trod out this design, tracing with his steps the pattern he had seen on the sacred turtle of the Lo River. Other titles refer to the Nine Provinces, as though these had constituted the location on which the nine steps were first taken. In short, the confusion of ideas regarding these patterns for the *t'a-kang pu-tou*[146] rites based on the Nine Halls or *Lo Shu* clearly indicates that we have reached the last stage in the evolution of the ancient plan: its final descent to a mere pattern for the performance of ritual magic.

Even though this final stage seems to have lingered on in Taoist circles into comparatively recent times, the active tradition of the *Lo Shu* ceased to exist a thousand years ago. For the magic square of three lost any real meaning in China by late T'ang, when it ended its remarkably versatile life as a most adaptable cosmic symbol.

[144] *Ibid.*, *Tao-fa hui-yüan*, 183.7.

[145] *Ibid.*, *Tung-hsüan pu, Kuan-tou chung-hsiao wu-lei wu-hou mi-fa*, p. 3.

[146] For this expression see Giles, *Dictionary*, No. 5906, second phrase.