

ABSTRACTS of Papers read at the Symposium on HISTORICAL SCIENTIFIC CONTACTS BETWEEN EAST AND WEST, held on 17th April, 1952

Probable Sources of the Numbers on which Jabirian Alchemy was Based

BY DR. H. E. STAPLETON

The evidence adduced in this paper would appear to justify the following conclusions :—

1. Jabirian science was an extension, into the realms of Alchemy and Magic, of the Pythagorean theory that the Universe and all it contains is made up of Numbers.

2. The Jabirian writers considered that the series 1, 3, 5, and 8, with their total of 17, as well as 28, were the basal numbers in Matter.

If the simplest Magic Square—which is alluded to more than once in the Jabirian *Corpus*—is gnomonically analysed (*vide* Fig. 1) it will be seen that the numbers in question are contained in this Square, the Gnomonic total being 28, with the other numbers in the four subsidiary cells outside the Gnomon.

Fig. 1

4	9	2
3	5	7
8	1	6

Gnomonic Dissection
of the simplest 9-celled Magic Square
assigned to SATURN (Lead)

Without using this method of analysis, such a deduction is not particularly obvious : and thus this particular Magic Square may have been used as a means of concealing these essential Numbers from all who had not been initiated into the Mystery of Alchemy.

3. The figures that make up a Magic Square do not, however, enable us to explain the fact that, prior to the adoption by alchemists of the Number 28, 60 was used : so that some way must be found of explaining why such an exchange occurred, and of ascertaining whether any mathematical relationship exists between these two Numbers.

The necessary explanation seems to be derivable from C. P. S. Menon's "Early Astronomy and Cosmology", in which a detailed study has been made of the methods used by Indian Astrologers in casting horoscopes. A square is used instead of a circle, and the sides of the square are subjected to successive bisections. By dividing each side into four parts, joining the corresponding opposite points by lines, and rubbing out the four central squares thus produced, a square enclosure is obtained, with 12 smaller squares forming an inner margin. These are regarded by Indian astrologers as representing the "Twelve Houses of the Zodiac".

If this bisection of the sides of the square be continued, the next number of marginal squares is found to be

28 :

and the next after that

60.

An astrological relation is thus established between these two Numbers, the first of which is the second "Perfect Number": and the second the unit of the Sexagesimal system of notation that was current in Mesopotamia from the earliest times.

4. Having thus established a mathematical relationship between the two numbers in question, it remains to be discovered why, at some comparatively recent date—between, say, the 1st cent. A.D. (Apollonius of Tyana) and the early half of the 10th cent. (date of final recension of the *Jabirian Corpus*), the older Number 60 was superseded by 28. Was this due to some peculiar importance being attached to the first Magic Square (and other Magic Squares with an odd number of cells) ?

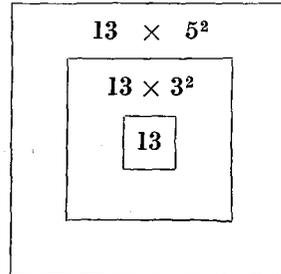
Enquiry as to why the authors of the *Corpus* mentioned this Magic Square, and why it was associated by later alchemists with the Planet Saturn and the Metal Lead, led to the observation that if the relation between the central number of any Magic Square with an odd number of cells, and the sum of all the Numbers in each "platform" of the Square be represented graphically, the resulting graph irresistibly reminds one of the ground plan of a multi-staged Mesopotamian *Ziggurat* (vide Figs. 2(a) and 2(b)). The relation between A (the number in the central cell) and the sum of those in the successive "platforms" (including the central number and those in the lesser "shells"), was found to be $A : A \times 3^2, A : A \times 5^2, A : A \times 7^2, \text{etc.}$

Fig. 2 (a)

8	4	25	16	12
2	23	19	15	6
21	17	13	9	5
20	11	7	3	24
14	10	1	22	18

25-celled Magic Square assigned to MARS (Iron)

Fig. 2 (b)



Graphical Representation of same.

In order to test whether any similar relationship existed in a *Ziggurat*, the measurements of various *Ziggurats* were considered, and, finally, the one at Borsippa—in the immediate vicinity of Babylon—was chosen. This was reconstructed in the time of Nebuchadnezzar (604–561 B.C.) and a further reason for selecting it (in addition to the platforms being square-based throughout) was that its seven platforms suggested comparison with the seven Magic Squares that are associated in mediaeval European Alchemy with both Planets and Metals. Using the measurements of Sir Henry Rawlinson, it was found that the relation between the areas of the different platforms was exactly the same as that between the central figures and successive layers of odd-totalled Magic Squares, viz.: $A : A \times 3^2, A : A \times 5^2, \dots$ with $A : A \times 13^2$ in the case of the basal platform. In

addition, it was found possible to represent the measurements of the platforms in exact numbers of Sumerian cubits.

In view of this last observation, as well as the existence of a single common relationship between the platform areas of at least one Mesopotamian *Ziggurat* and those of odd-numbered Magic Squares, it would appear reasonable to infer that such Magic Squares may have been designed as a means of secretly recording the platform plan of this particular variety of one of the most ancient forms of Temple in the world.

A further important inference—from the point of view of the growth of “scientific” knowledge in Neo-Babylonia—may also be drawn from the name assigned to the Borsippa *Ziggurat*, viz. :— *E-ur-imin-an-ki* (Temple of the Seven Rulers of the Heavens and the Earth). It is difficult not to conclude that the name indicates an astrological association between the seven platforms of the building and the then recognized seven wandering stars—the Sun, the Moon, and the five planets, Mercury, Venus, Mars, Jupiter, and Saturn; and, if this is so, the increase made by Nebuchadnezzar in the number of platforms, as well as the numerical relationship that has been demonstrated between the areas of the platforms, points to a greatly-increased local interest in mathematical astrology. It can now hardly be doubted that Rawlinson’s description¹ of the Borsippa *Ziggurat* as a “quadrangular representation of the old Chaldean planisphere” correctly sums up Nebuchadnezzar’s objective when ordering the original more ancient tower to be remodelled.

¹ Journ. Royal As. Soc., XVIII (1861), p. 18.

John Mesue and his Work

BY D. M. DUNLOP, M.A.

Symphorianus Campegius, in an edition of the Latin corpus of Mesue Junior (Lyons, 1540), gives the floruit of John Mesue as *circa* 1154. John Mesue actually flourished *circa* 800. The main facts of his life are well known from Arabic sources, notably Ibn abi Usaibi’ah (13th century), who makes much use of Yūsuf b. Ibrahim, a contemporary of John Mesue. The date *circa* 1154 does not come from the source indicated for Mesue Junior, the *De medicis et philosophis Arabibus* of Leo Africanus (16th century), which was not published till 1664. It was not invented by Symphorianus, but should come from Latin MSS. of the corpus. There is no Arabic account of Mesue Junior, nor are any Arabic MSS. known which contain the original of the corpus.

That Arabic sources were used for the corpus is certain, from the presence in it of such barbarous Latin words as *robub*, *loch/lohoc* (whence *looch*, *lok*, still in pharmaceutical use in French), *zubendech/zeudech*, cf. *zeudech Mesuae* in Vesalius (Hyrtl). In view of the fact that John Mesue is (incorrectly) connected with Damascus by the Latins, Constantine Africanus (11th century), who appears to have invented the figure of Joannes Damascenus, author of medical texts (Steinschneider), is indicated as author of the Latin corpus. On the other hand, the latest authority in the corpus is Avenzoar (d. 1162), cited *De Simplicibus* c. xii (*De Absinthio*). We seem to be thrown back on the view that the corpus of Mesue Junior is the work of a Latin doctor, unspecified, using Arabic sources.

John Mesue left a number of works in Arabic, of which 44 are listed by Ibn abi Usaibi’ah. Some of these may be the basis of the Latin corpus. Four have been edited by Paul Sbath: the *Book of the Times* (1933), the *Medical Axioms* (1934), *Simple Aromatic Substances* (1936), and the *Book on Barley-water* (1939). An important contribution on the ophthalmology of John Mesue