Leeds Studies in English

THE LEXICOGRAPHY OF ' CIPHER.'

The word *cipher* or *cypher* in English has two areas of meaning, one connected with arithmetic and one with handwriting. We have failed to distinguish between the two areas of meaning by the form of the word, either form being used ambiguously.

This diversity of meaning existed in the languages from which we took the word. The form of the word was taken from French; but semantic values gathered round the word as it was used in translations from both French and Spanish. Put into its simple form, as by H. C. Wyld in his *Universal English Dictionary*, the etymology of the word is that M. E. *siphre* is an adaption of O. Fr. *cifre*, from Sp. *cifra*, the origin of which is given as Ar. *sifr* ' empty thing, a cipher,' the second meaning of which seems to beg the question. Wyld gives the meaning of Spanish *cifra* as ' o,' and points out that O. Fr. *cifra* gives Mod. Fr. *chiffre* which he translates ' figure.' I quote Wyld because his is the best-informed of popular dictionaries. The accounts of Skeat in his *Etymological Dictionary* and of the *New English Dictionary* itself are also unsatisfactory in that they make no attempt to explain the origin of the two distinct areas of meaning of the word, leaving it to the imagination to suppose that the dual application of the word is found in Arabic, or to connect the notions by the fact that one begins to practise European handwriting by making a series of O-s.

Now Baron Carra de Vaux has stated in his article *Astronomy and Mathematics* in *The Legacy of Islam* (Oxford, 1931, p. 386) that the Spanish word *cifra* had two origins, and two sets of meanings from the beginning. ' It may be noted,' he writes, ' that the Latin word *cifra* has a double meaning: it is sometimes zero, sometimes the ciphers themselves. In the sense of zero, it is evidently the Arabic *çifr* empty; in the meaning of numeral it is clearly the *sifr* (with *s*) which means something

written, a book or character.' If the Baron's main thesis is correct, we have to do with two distinct Arabic words. Postponing an examination of the weakness of his thesis, we here note that his analysis is unsatisfactory: the widening of the meaning ' nought ' to include all Arabic numerals is easy to understand, especially since ' nought ' is the essential figure in algorism. Surely *sifr* may rather be the origin of the meanings connected with writing. Incidentally, the question as to whether Old French *cifre* was taken from Spanish *cifra* or medieval Latin *cifra* (also *cifrum*) is not yet settled.

We may note in passing that the difference in pronounciation between the Arabic letters *sīn* and *çād* (transliterated here s and *ç* respectively) is not readily noticeable to a foreigner. Phonetically they are distinct: the former is a dental fricative and the latter a velarised alveolar fricative; but no distinction was or could be made between them in the Arabic loan-words in Spanish or in any other European language. Both of them were occasionally voiced—*sīn* in *zenith, azimuth, fez,* and *çad* in *zero, alezan, alizarin*—but no difference was made between the two. It is by exception that in French either is converted to *sh - sīn* in *gamache,* and possibly both *sīn* and *çād* in *chiffre* (though this is a later fifteenth century change possibly due to the influence of Italian *cifra*: the earlier French forms were *cyfre, cifre, ciffre*). There is no reason why *sifr* and *çifr* should not both be represented by *cifra* in Spanish and Latin. For a full account of the sound-changes from Arabic to Spanish see Dozy & Engelmann's Introduction to *Glossaire des mots espagnols et portugais dérivés de l'arabe* (Leyden, 1869), and from Arabic to French, H. Lammens, Introduction to *Remarques sur les mots français dérivés de l'arabe* (Beyrouth 1890).

If we accept the Baron's suggestion of a dual origin of the word *cifra,* we are faced with a lexicographical problem: how to disentangle the many different semantic values of the word *cipher,* and to give a convincing arrangement of them. It is clear that according to him we must record two words *cipher,* distinct in meanings and in origin.

The two areas of meaning of the word are found already in Spanish: *cifra* is translatable ' the figure O, zero, arithmetical mark,' etc., and also ' contraction, abbreviation, code,' etc. There is also the verb *cifrar* which may be translated ' to write in cipher, to abridge ' and also ' to inclose ' (surely from the meaning ' O ' ?). Medieval Latin adopted the word, with all its potentialities of meaning. Italian *cifra* is translatable ' arithmetical figure ' and also ' device, initial,' etc. French *chiffre* is ' figure, number, digit, total amount,' but also ' monogram, flourish of letters, (secret or private) code '; and the verb *chiffrer* shows a similar adaptability to its context; *chiffrage* is ' writing in code ' and also ' valuation,' but *chiffrature* is ' pagination of books.' No doubt if Romance scholars were to produce dictionaries comparable to the *New English Dictionary* we should see an astonishing variety of semantic values for the above words.

For English the following might be offered as a tentative solution to the lexicographical problem. Definitions and dates are abstracted from the evidence collected in N.E.D.

CIPHER (1) [M.E. *siphre* f. O.Fr. *cyfre* f. Sp. (Pg., It., Med. L. *cifra* f. Ar. *çifr* ' nought,' orig. ' empty ' (cf. *çafara* ' to be empty '), translating Sanskrit *śūnya*, the Hindu word for the symbol, also orig. ' empty.' The earliest Hindu-Arabic character for nought was O, not . as in modern Arabic, where an empty oval is the figure 5.]

As a substantive:

1. The arithmetical symbol for nothing (O). 1399.

2. A numerical figure; a number. 1530.

3. *fig.* A person who fills a place, but is of no importance. 1579.

4. The continuous accidental sounding of a note on an organ. 1779.

5. The zero-point of a thermometer. 1796 *obs.*

As a verb:

6. To use the Arabic numerals. 1530.

7. To make nought of. 1589 *obs.*

8. In navàl architecture, to bevel away. 1674.

9. To calculate. 1837. (U.S. colloq.).

10. To put out without scoring (in cricket). 1882 *obs.*

11. To sound any note continuously without pressure on the key of an organ. 1779.

12. To work out arithmetically. 1860.

From this word are derived *cipherhood* (1679) and *cipherize* (1674), both obsolete.

CIPHER (2)   [M.E. *siphre* f. O. Fr. *cyfre* f. Sp. (Pg., It., Med. L.) *cifra* f. Ar. *sifr* ' book, writing ' f. Aramaic (see Fraenkel *Aram. Fremdw. im Arab.* p. 247).]

As a substantive.

1. A secret manner of writing. 1528.

2. A symbolical character. 1533.

3. An astrological sign or figure. 1590 *obs.*

4. A monogram (esp. in Arabic characters). 1631.

As a verb:

5. To express by characters. 1563.

6. To decipher. 1593 *obs.*

7. To express by a monogram. 1628.

From this word are derived *cipherable* (1888), *ciphered* (1611), *cipherer* (1648), *ciphering* (1536), *decipher* (vb. & sb. 1545), *decipherable* (1607), *decipherably* (1890), *decipherage* (1851 *obs.*), *decipheration* (1838 *obs.*), *decipherer* (1587), *decipheress* (1763, becoming obsolete with the equality of sexes), *deciphering* (1552) *decipherment* (1840), *uncipher* (1598 *obs.*), *undecipher* (obsolete in the original meaning ' to decipher ' 1654, but perhaps still used for ' to make undecipherable ' 1856), *undecipherable* (1757), *undecipherability* (1890), *undecipherably* (1847), *undeciphered* (1668).

The second word *cipher* has more life in it than the first one, both in its frequency of use and in its power of forming derivatives.   The first word, owing to its ambiguity in many contexts, is fast falling into desuetude, being replaced in most contexts by ' zero,' ' figure,' ' to reckon,' etc.   Is it too late to suggest the revival of the earlier spelling *cypher* for the first word ?

' 'Twas certain he could write, and cypher too.'

This distinction of form would be useful even if the distinction of etymology were rejected. And there are reasons for not accepting it at present. In the first place *sifr* is a loan-word in Arabic from Aramaic (see S. Fraenkel *Die aramäische Fremdwörter im Arabischen* p. 247), and is rare in Arabic, except in the popular saying, ' like an ass laden with books.' Whether it was equally rare in Spanish Arabic we have no means of knowing; nor do we know to what extent the cognate Hebrew word was used in Spain. In the second place the meaning of *sifr* is ' book,' particularly ' holy book,' also ' something written '; but the meaning ' character ' (which we particularly want, in the sense of *Buchstabe*) seems not to be recorded in the Arabic dictionaries; and the context in which the Baron has found it with this meaning must be an exceptional one.

Yet if we reject *sifr* as an etymon, we have to say how in Spanish *cifra* extended its meaning from ' nought ' to ' a secret manner of writing.' And that at present we cannot do.

The modern Arabic word for a code is *shifr*. This must be a borrowing-back of French *chiffre*.

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