AN ELABORATE MEDIEVAL MNEMONIC

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Every schoolboy is familiar with such memory aids as ROY G BlV for the colors of the rainbow or FACE for the interlineal notes of the treble clef. Far fewer people are aware of an elaborate but tightly-constructed mnemonic used in an earlier era to remember the various forms of the syllogism. To review, a syllogism consists of a major premise, a minor premise, and a conclusion, such as

Every mammal is a vertebrate (major premise)
Every cat is a mammal (minor premise)
Therefore, every cat is a vertebrate (conclusion)

Syllogisms come in 24 basic formats -- fourteen proposed by Aristotle, five validated by his sutdent Theophrastus, and five more by Ariston of Alexandria.

Recently, while studying the entry under "Traditional Logic" in The Encyclopedia of Philosophy (Macmillan, New York, 1967) edited by Paul Edwards, and Book 11 of Elements of Logic (Sheldon and Company, New York, 1866) by Richard Whately, onetime archbishop of Dublin. 1 learned that an elaborate mnemonic was once constructed to remember the format of each syllogism and its method of proof. This tour de force deserves to be resurrected to show how much information can be packed into a carefully-thought-out mnemonic.

The mnemonic consists of four lines of six names apiece:

Barbara, **Celarent**, **Darii**, **Ferio**, Barbari, Cesaro
Cesare, Camestres, Festino, Baroco, Celaront, Camestrop
Darapti, Disamis, Datisi, Felapton, Bocardo, Ferison
Bramantip, Camenes, Dimaris, Fesapo, Fresison, Camenop

The five boldface syllogisms are the ones due to Theophrastus, and the five underlined ones due to Ariston; these latter were originally given in a separate line, but are here presented in their logical order for explanatory clarity.

What information does this mnemonic contain? To begin with, there are four basic forms possible in each line of a syllogism:

A: every ... is (a) ...
E: no ... is (a) ...
I: some ... is (a) ...
O: some ... is not (a) ...

The three vowels in each name represent respectively the forms of the major premise, the minor premise and the conclusion of the corresponding syllogism.

Looking at the three lines of a syllogism as a whole, one observes that syllogisms come in four varieties, called figures. Letting M, P and S stand for quantities to be filled in (in the dotted spaces of the forms), such as mammal, cat and vertebrate in the example above, the four figures are:

First Figure: every M is a P; every S is an M; therefore every S is a P

Second Figure: no P is an M; every S is an M; therefore no S is a P

Third Figure: every M is a P; every M is an S; therefore some S is not a P

Fourth Figure: every P is an M; every M is an S; therefore some S is not a P

In brief, the figures differ in the order in which the Ms, Ps and Ss appear in the premises and conclusion: MP SM SP, PM SM SP, MP MS SP, PM MS SP. (The particular forms used above correspond to the syllogisms represented by Barbara, Cesare, Darapti and Bramantip; others, of course, might have been used for illustration.) In the mnemonic, all names in the first line correspond to syllogisms arranged according to the First Figure, all names in the second line to syllogisms arranged according to the Second Figure, and so on. In other words, after having memorized the AEIO table and the four orders of quantities in figures, the vowels of the 24 names and the placement of the names in the lines completely specify the format of the 24 syllogisms.

But there is more! At first blush, the consonants in the names appear to be useless filler, but they tell the student how to prove the syllogisms. In Aristotle's view, the first four syllogisms (Barbara, Celarent, Darii, Ferio) were self-evident axioms, and the others were to be proved by reducing them to one or another of these. The first consonant in each name tells the student which axiom the syllogism is to be reduced to – thus, Dimaris, Disamis, Datisi and Darapti are all to be proved by showing they are equivalent to Darii.

Certain other consonants in each name label the logical steps that are to be used in such a reduction. The letter M indicates that one is to interchange the two premises of the syllogism; the letter S indicates that the two quantities in the premise identified by the immediately preceding vowel are to be interchanged (for example, every M is S becomes every S is M); the letter P indicates that the S-interchange is to take place and the form of the premise is to be weakened as well (that is, $\overline{A \text{ to } I}$, or E to O). The internal consonant C identifies a somewhat more complicated logical step called "indirect reduction": the denial of the conclusion (that is, changing E to A, or A to E), together with either premise, implies the denial of the other premise. For example, one could replace the syllogism at the beginning of this article with:

No cat is a vertebrate
Every mammal is a vertebrate
Therefore, no cat is a mammal

Actually, C is used in only two of the twenty syllogisms, Baroco and Bocardo.

I illustrate a typical proof by examining the Second Figure name Camestres, which is to be reduced to Celarent. One starts with

Every P is an M; no S is an M; therefore no S is a P

The Ss following the two vowels E tell us to interchange quantities in the minor premise and the conclusion:

Every P is an M; no M is an S; therefore no P is an S

Next, the letter M tells us to interchange the premises:

No M is an S; every P is an M; therefore no P is an S

But, if the variables P and S are swapped throughout the syllogism, this becomes the syllogism coded by Celarent:

No M is a P; every S is an M; therefore no S is a P

Out of the 169 letters used in the 24 names, only 44, or about 25 per cent, are non-functional – that is, needed to create names containing the essential vowels and consonants. I doubt that modern logologists can do any better, using contemporary words instead of those hard–to–remember names. If anyone wants to try, he is, of course, allowed to make different vowel and consonant assignments – EAOl, for example, instead of AEIO, or STRN for the internal consonants MSPC – but the overall structure and strategy outlined above must be preserved.

FINE AND APPLIED ARTS TERMS INDEX

This is an alphabetical listing of approximately 45,000 terms relating to "objets d'art, objets de vertu, bibelots, antique furnishings, jewelry, rugs and carpets, paintings, engravings, drawings, sculptures, as well as designs, styles, periods, influences, motifs, ornamentation, components, shapes, production techniques, materials and finishes." Editor-in-chief Laurence Urdang of Verbatim points out that this is a field especially likely to embrace new (and outre) terminology; as such, it contains much rich material for the logologist. from medullary rag to schneeballen, from kotchak to katechu, from hob in the well to wag-on-wall clock, from dog of Fo to fu-dog mount, from og and oog to bee and brickwork. The words are given without definition, and have been taken from about 25 books on collectibles plus a variety of Christie's and Sotheby Parke Bernet catalogues of 1982 and 1983. The book is available from Gale Research Company for $85.