Preface

The Gregorian reform of the Julian year is based on the ratio 3 : 400. The Gregorian reform of the Dionysian moon table is based on the ratio 8 : 2,500 which in turn is analysed into the ratios 1 : 300 and 1 : 400. The simplicity of these numbers is evidence of the desire to make the new calendar as simple as possible, and facilitate mental calculation. This was good tradition, as Dionysius Exiguus himself, the grandfather of the computus ecclesiasticus, had already brought to bear mental calculationist criteria in his argumenta paschalia.

For this reason the following paper, investigating into methods of knowing key calendar dates by use of mental calculation, may even contribute to a deeper understanding of the historical subject.

Of course there are excellent text books about calendrical mathematics, the most conspicuous being perhaps Nacham Dershowitz / Edward M. Reingold, *Calendrical Calculations* (first edition 1997). This book represents a universal approach, aiming at a unified mathematical description which can be used to compute key calendar dates of many calendars. Unfortunately, though, mathematicians do very seldom care for mental calculation, and their algorithms, appropriate for the PC, are more often than not quite useless for the mental calculator, nor do mathematicians analyse the calendrical material in a way that satisfies the historian.

Thus I conclude that instead of following ready-made algorithms as presented by academic mathematics we have to start anew and find algorithms which suit our purpose.

An algorithm is adequate for mental calculation if it is not too complex and if its components can be mentally calculated or produced by memory. A fine example is the algorithm for the day of the week as offered by the French mnemotechnician Aimé Paris (1866), an algorithm which follows the flow of speech, and which – with due mnemonic help – allows a quasi-instantaneous access to its components (Chapter 1, § 4). A similar example is the algorithm to compute the first Saturday (or Sunday, Monday etc.) of a given month. (Chapter 2, § 2). Another example is the algorithm for the Easter date (Chapter 3).

These algorithms are complete, but sometimes the object for consideration will be just too complex to allow for a simple solution. In these cases a good strategy is to construct a simple algorithm which approximates the facts so closely that its exceptions can easily be learned by some suitable mnemonics. Examples are the approximation of molad Tishri, and of Tishri 1 (Chapter 5), and of the vernal full moon (Chapter 6).

These strategies presuppose a close alliance between mental calculation and mnemonics. The idea is to construct a mnemonic mathematics which paves the way for pure mnemonics, i.e. to the construction of fantasy in order to learn what is left after mental calculation has reached its limits as sheer matter of fact. It is the same idea as was taught by the German mnemonist Hugo Weber-Rumpe in respect to French Grammar in 1891: To devise a truly mnemonic grammar, easy to be learned because of its simple logic, and leaving not too many exceptions for final mnemonic treatment. In *Esels Welt. Mnemotechnik zwischen Simonides und Harry Lorayne* (2001) Chapter 5.4 you can find a longer discussion about this problem.

In 2003 I published *Das Jahr im Kopf. Kalender und Mnemotechnik*, an enquiry into Christian and Jewish computistics with explicit mental calculation algorithms and mnemonic constructions for the day of the week, the Easter date, Tishri 1 and the vernal full moon. The main focus is clearly on mnemonics, the construction of Zweckphantasie in the tradition of Johannes Buno (1617–1697). In the following paper I present the basic scheme of that book with some mathematical improvements, but without any explicit mnemonics.

As these changes in mnemonic mathematics which I propose in the following paper may allow for a new mnemonical treatment, I make it a part of the series *Beiträge zur Mnemotechnik*.

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