Problem Texts

Problem texts are the most important source of information on Egyptian mathematics. From the extant hieratic mathematical texts roughly 100 problems are known. They come from an educational context, written either in a teachers handbook (e.g. the Rhind mathematical papyrus) or by a student practising mathematical techniques (e.g. the Moscow mathematical papyrus).

As the name indicates, they name a problem and then give instructions to solve it. The general structure of a problem is to announce the type of problem in the heading (which may be written in red). Second the given data are listed and the entity that shall be calculated is named. Then a series of instructions follows. Each instruction usually comprises one arithmetical operation (addition, subtraction, multiplication, division, halving, squaring or the extraction of a square root), followed by the respective intermediate result. The sequence of instructions is the solution that leads to the numeric result of the problem. This result is announced in a final sentence. In addition, the calculations that have to be carried out may be noted, or, in some instances small sketches are drawn next to the text of the problem. The individual sections of the problem are marked by different grammatical structures as well as by stereotypic formulas.

The form of these problems can be characterized according to Jim Ritter (1995) as *rhetorical*, *numeric*, and *algorithmic*. Rhetorical refers to the texts being given as a prose text without the use of mathematical symbols like for example our modern + or −. Numeric denotes the practice of always using concrete numbers. Algorithmic refers to texts that provide a sequence of instructions to solve a problem.

The scribes learnt to follow these procedures when they encountered a specific problem. "Specific" refers to the type of problem only, and not to the numerical values.

Among the Illahun mathematical fragments, five are problem texts or texts related to problem texts: UC 32118B, UC 32134A, UC 32134B, UC 32160, and UC 32162.