

General Note on the Translation.

In this translation, each chapter of the *Arithmetica Logarithmica* is presented in four parts: -

1. A Synopsis of the chapter;
2. The main translation of the chapter in modern English;
3. Notes and comments;
4. The original Latin text.

A brief outline of the function of each part is now given:

1. The Synopsis. Although no algebra as such is used in the original text, Briggs' intuitive arithmetical approach can be conveniently recast algebraically for the benefit of the modern reader, and presented in an introductory synopsis box, chapter by chapter. Each summary is meant as an aid to the understanding of the main text, yet kept apart from it, in order to avoid confusion with algebraic notation that was not available to Briggs in the early 1620's. The synopsis is hence a bridge between modern mathematics and the contemporary mathematical scene. The first half of the book is concerned with introducing the reader to the concept of logarithms, and shows how Briggs' tables of logarithms were derived; the second half from Ch. 17 onwards, gives a number of mainly geometric applications, but also deals with the Fibonacci numbers, gauging, etc.

2. The Main Translation of the Chapter. The intention of the translation is to stay as close as possible to the Latin original as understood by the translator, which is included at the end of each chapter. Thus, as little of the text has been paraphrased as possible; on the other hand, it must be presented in such a way that it is understood without too much effort by the modern reader. There are places, especially in the introductory remarks to a chapter, where the original writing has been enlarged upon to convey the meaning which becomes apparent only from familiarity with the work. Briggs' explanations at times are laboured, as he attempts to describe in words, operations with numbers that would now be described algebraically. Most of the actual working is presented in ubiquitous tables, which was the usual approach at the time, and these also may offer short explanations. Extra words or occasional phrases have been inserted to help the flow of the argument in English, without changing the meaning. Items in square brackets, such as table labels, e.g. [Table 1-1], are *not* present in the original text, and have been inserted for the reader's convenience; occasionally extra phrases are inserted in square brackets to aid the explanation without having to refer to an indexed note. The subjunctive mood, though a strong feature of Latin sentences, e.g. for expressing possible outcomes, etc., plays no great part in modern English writing, and hence in the translation simple present, past, and future tenses are normally used, in accordance with the usual style of writing adopted in mathematical texts. The convoluted style used

by Briggs, (&Vieta and their contemporaries) has made this translation a rather trying process over a considerable length of time.

Any points of contention in the translation that arise for the reader can be referred back to the Latin original. It was, of course, difficult for early workers in the exact sciences to use Latin to explain concepts for which the language was never intended: Latin words or phrases are adapted for use in a restricted mathematical sense that only becomes apparent from an extensive reading of the original text. At the time, there was a very limited mathematical framework for new ideas outside classical Greek geometry: the reader may be disappointed by the lack of explanation offered for some of the more forward-looking concepts introduced by Briggs. Thus, there was no contemporary explanation for his square root difference algorithm that greatly aided in extracting the numerous square roots needed to find the logarithms of numbers from first principles; or for the numerical limiting approximation whereby the natural and then base ten logarithms of primes were found; or again for the subtabulation schemes that he introduced to interpolate between known values to fill out the tables, etc.

It is important, however, not to fall into the trap of making anachronistic appraisals of such things: this is the original presentation, and as such it must stay; the reader must be prepared to view the mathematical scenery presented with rather restricted vision, in order to appreciate the work. Such new ideas as there were at the time had flowed mainly from the pen of Vieta: thus, Briggs presumably discovered his numerical procedure for extracting the roots of polynomials by simplifying the process of affected cubes that Vieta had introduced. Again, Leonard and Thomas Digges, via the *Pantometria*, had an influence on the trigonometric aspects of the work. On the other hand, the influence of Thomas Harriot, Briggs' contemporary, is hard to find: he does not get a mention in any of Briggs' work, yet he was arguably the most outstanding mathematician of the time immediately after Vieta: perhaps one has to look at religious, political, and character differences to account for this omission, as the two men appear to have had little in common: apart from being the two outstanding mathematicians in England at the time. Nevertheless, Walter Warner, one of Harriot's close associates, was to make a valiant but eventually fruitless attempt to publish the missing Chiliades in Briggs' tables.

3. Notes: The indexed notes are meant to handle situations where more explanation can be provided than the author has given; also, a note may draw attention to relevant historical details that may be of interest to the reader. Some are quite extensive: as this is a web document, the writer is aware of the difficulty of moving to different parts of the document; thus, some of the notes are better thought of as appendices.

4. The Latin Text: This is copied straight from a facsimile of the original text. An electronic Latin parser has been used to check the spelling in this transcription: this has been an invaluable asset, though doubtless mistakes

remain. Occasionally words are abbreviated in the original, as space was at a premium: these have been restored to their full length in the transcription.