Chapter Four

§4.1. ***Synopsis: Chapter Four.***

The index or logarithm associated with a powers of ten is given a special name: the characteristic. In addition, the numbers lying between 1 and 10 have characteristic 0; while those between 10 and 100 have characteristic 1; between 100 and 1000, characteristic 2, etc. It became conventional, following Vlacq's 2nd edition of the *Arithmetica*, to put the decimal point after the characteristic, but Briggs did not do this, merely using a comma, or no special indicator at all, which we follow here. Briggs demonstrates several numbers involving an integer and a fractional part which have the same logarithm but differing characteristics.

§4.2 *The Characteristics of Logarithms.*

But of all logarithms, the particular ones I have adopted are these which are assigned to one and ten; certainly the nearest to themselves must be those numbers which are continued in the ten-fold ratio, namely by a hundred, a thousand, etc, which are all described by zeros only after the first place to the left, which we shall call the characteristic, which will indicate to us how many units the whole number advances beyond the place of unity. Also, for these [multiples of ten] the remaining nearby numbers have the same characteristic. Indeed, the characteristic of unity, and of all of the whole numbers which can be written with a single place (clearly those which are less than ten) is zero. Of ten, assuredly, and of the remainder numbers as far as one hundred, which have been described with two places, the characteristic is 1; from one hundred to a thousand, assuredly 2; from a thousand to ten thousand, 3; and thus successively, with the characteristic, or the number of the places beyond the place of unity, always increasing.

If a fraction has been attached to an integer, it is permitted to write the whole number with more places: the characteristic of that [combination] however only considers the places with which the whole number is written; the remaining places following, with which the added parts are expressed, have no ratio.

7	0,845098	49	0,690196
49	1,690196	343	0,535294
343	2,535274	2401	0,380392
2401	3,380392	16807	1,225490
16807	4,225490		

[Table 4-1]

As for instance 343, the Logarithm of which is 2,535274, the first place to the left of this is 2,

which we call the characteristic: because the given number is positioned between a hundred and a thousand. But [regarding] 34$\underline{3}$ & 3$\underline{43}$, it is permitted that the logarithms of these keep the same remaining places; nevertheless, the first place to the left both change. Indeed, the logarithm of this is 0,535294, (because here 3$\underline{43}$ is less than ten), of the other one, it is indeed 1,535294.

§4.3. **Caput IIII.** **[p.4.]**

Logarithmorum Characteristica.

Logarithmorum autem omnium praecipui sunt ij qui Vnitati tribuuntur & Denario, istis vero proximi ijs numeris debentur qui in decupla ratione continuantur, nempe Centenario, Millenario, &c., qui omnes cyphris tantum describuntur praeter primam notam versus sinistram, quam Characteristicam appellare poterimus, quos nobis indicet quot notis numerus integer progreditur ultra locum Vnitatis. Eandem etiam habent Characteristicam reliqui numeri ijsdem proximi. Vnitatis nempe & omnium integrorum qui unica nota scribi poterunt (eorum scilicet qui sunt Denario minores) Characteristica est cyphra. Denarij vero & reliquorum usque ad Centenarium qui duabus notis [p.5.] sunt descripti Characteristica est 1, a Centenario vero ad Millenarium 2. a Millenario ad decies mille 3, & sic deinceps, crescente semper Characteristica pro numero locorum ultra locum Vnitatis.

Quod si numero integro partes adhaeserint, licet totus numerus pluribus notis scribatur: eius tamen Characteristica respicit tantum illas notas quibus integrae unitates scribuntur, reliquarum subsequentum notarum, quibus partes adjunctae exprimuntur, nulla habita ratione. ut

7	0,845098	4$\underline{9}$	0,690196
49	1,690196	3$\underline{43}$	0,535294
343	2,535274	2$\underline{401}$	0,380392
2401	3,380392	16$\underline{807}$	1,225490
16807	4,225490		

Ut 343 cuius Logarithmus 2,53529,4, huius prima nota versus sinistram quam Characteristicam appellamus, est 2: quia datus numerus situs est inter Centenarium & Millenarium, at 34$\underline{3}$ & 3$\underline{43}$ licet eorum Logarithmi reliquas notas servent easdem, primas tamen versus sinistram mutat uterque. est enim huius Logarithmus 0,53529,4 (eo quod 3$\underline{43}$ est denario minor) illius vero 1,53529,4.