I. *A new Method for making* Logarithms, *and* vice versâ, *for finding the Number corresponding to a* Logarithm *given, by help of the following Table. Communicated by Mr.* John Long, S. Theol. Bacc. *and Fellow of* Corpus Christi *Coll.* Oxon.

Log.	*Nat. Num.*
0,9	7.943282347
0,8	6.309573445
0,7	5.011872336
0,6	3.981071706
0,5	3.162277660
0,4	2.511886432
0,3	1.995262315
0,2	1.584893193
0,1	1.258925412
0,09	1.230268771
0,08	1.202264435
0,07	1.174897555
0,06	1.148153621
0,05	1.122018454
0,04	1.096478196
0,03	1.071519305
0,02	1.047128548
0,01	1.023292992
0,009	1.020939484
0,008	1.018591388
0,007	1.016248694
0,006	1.013911386
0,005	1.011579454
0,004	1.009252886
0,003	1.006931669
0,002	1.004615794
0,001	1.002305238

Log.	*Nat. Num.*
0,0009	1.002074475
0,0008	1.001843766
0,0007	1.001613109
0,0006	1.001382506
0,0005	1.001151956
0,0004	1.000921459
0,0003	1.000691015
0,0002	1.000460623
0,0001	1.000230285
0,00009	1.000207254
0,00008	1.000184224
0,00007	1.000161194
0,00006	1.000138165
0,00005	1.000115136
0,00004	1.000092106
0,00003	1.000069080
0,00002	1.000046053
0,00001	1.000023026
0,000009	1.000020724
0,000008	1.000018421
0,000007	1.000016118
0,000006	1.000013816
0,000005	1.000011513
0,000004	1.000009210
0,000003	1.000006908
0,000002	1.000004605
0,000001	1.000002302

Log.	*Nat. Num.*	*Log.*	*Nat. Num.*
0,0000009	1.000002072	0,00000009	1 000000207
0,0000008	1.000001842	0,00000008	1.000000184
0,0000007	1.000001611	0,00000007	1.000000161
0,0000006	1.000001381	0,00000006	1.000000138
0,0000005	1.000001151	0,00000005	1.000000115
0,0000004	1.000000921	0,00000004	1.000000092
0,0000003	1.000000690	0,00000003	1.000000069
0,0000002	1.000000460	0,00000002	1.000000046
0,0000001	1 000000230	0.00000001	1.000000023

This Table is what I ſometimes make uſe of for finding the Logarithm of any Number propos'd, and *vice verſâ*. For inſtance: Suppoſe I had occaſion to find the Logarithm of 2000. I look in the firſt Claſs of my Table (the whole Table conſiſts of 8 Claſſes) for the next leſs to 2, which is 1.995262315, and againſt it is 3, which conſequently is the firſt Figure of the Logarithm ſought. Again; dividing the Number propos'd 2, by 1.995262315 the Number found in the Table, the Quotient is 1.002374467; which being look'd for in the ſecond Claſs of the Table, and finding neither its equal, nor a leſſer, I add 0 to the part of the Logarithm before found, and look for the ſaid Quotient 1.002374467 in the third Claſs, where the next leſs is 1.002305238, and againſt it is 1, to be added to the part of the Logarithm already found; and dividing the Quotient 1.002374467, by 1.002305238, laſt found in the Table, the Quotient is 1.000069070 which being ſought in the fourth Claſs gives 0, but being ſought in the fifth Claſs gives 2, to be added to the part of the Logarithm already found; and dividing the laſt Quotient by the Number laſt found in the Table, *viz.* 1.000046053, the Quotient is 1.000023015, which being ſought in the ſixth Claſs, gives 9 to the part of the Logarithm already found: And dividing the laſt Quotient by the new Diviſor, *viz.* 1.000002072, the Quotient is 1 000002019, which being greater than 1.000000115, ſhews that the Logarithm already found, *viz.* 3.3010299 is leſs than the Truth by more

more than half an Unit; wherefore adding 1, you have *Briggs's* Logarithm of 2000, *viz.* 3.3010300.

If any Logarithm be given, suppose 3.3010300, throw away the Characteristic, then over against these Figures 3 ... 0 .. 1 ... 0 .. 3 .. 0 .. 0, you have in their respective Classes 1.995262315 ..., 0 ..... 1. 002305238 ...... 0 ..... 1 . 000069080 .... 0 .. 0 which multiplied continually into one another, the Product is 2.000000019966, which by reason the Characteristic is 3, becomes 2000.00001 9966, *&c.* that is, 2000, the Natural Number desired. I shall not mention the Method by which this Table is fram'd, because you will easily see that from the use of it.

It is obvious to the intelligent Reader, that these Classes of Numbers are no other than so many Scales of mean Proportionals: In the first Class, between 1 and 10; so that the last Number thereof, *viz.* 1,258925412 is the tenth Root of 10, and the rest in order ascending are the Powers thereof. So in the second Class, the last Number 1,023292992 is the hundredth Root of 10, and the rest in the same manner are Powers thereof. So 1,002305238 in the third Class, is the tenth Root of the last of the second, and the rest its Powers, *&c.* Or, which is all one, each Number in the preceding Class, is the tenth Power of the corresponding Number in the next following Class: Whence 'tis plain, that to construct these Tables requires no more than one Extraction of the fifth or sursolid Root for each Class, the rest of the Work being done by the common Rules of Arithmetick; and for extracting the fifth Root, you will find more than one very compendious Rule in *Num.* 210 of these *Transactions*, if any one shall desire to examin the *computus* of these Tables.

The Process is exactly the Reverse of Mr. *Briggs*'s Doctrine, in *Cap.* XII. of his *Arithmetica Logarithmica* of *Vlacq*'s Edition; and had *Briggs* been appriz'd hereof, it would have greatly eased the Labour of deducing the Logarithms of the first prime Numbers, which appear to have cost him so much Pains.

II. *An*