TABLES FOR FACILITATING ARITHMETICAL CALCULATIONS, INTENDED FOR CALCULATING THE PROPORTIONATE CHARGES ON THE PARISHES IN POOR LAW UNIONS, AND WHICH ARE ALSO USEFUL FOR VARIOUS OTHER PURPOSES

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THOMAS FOWLER

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DEDICATED BY PERMISSION TO

THE

RIGHT HONOURABLE LORD CLINTON,

CHAIRMAN OF THE BOARD OF GUARDIANS OF THE
TORRINGTON UNION.

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BY THOMAS FOWLER,

TREASURER TO THE TORRINGTON UNION.

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LONDON:

1045.

To the

Right Honourable

LORD CLINTON.

My Lord,

In permitting me to dedicate to your Lordship the present Tables, you have conferred upon me an Honor for which I feel truly grateful.
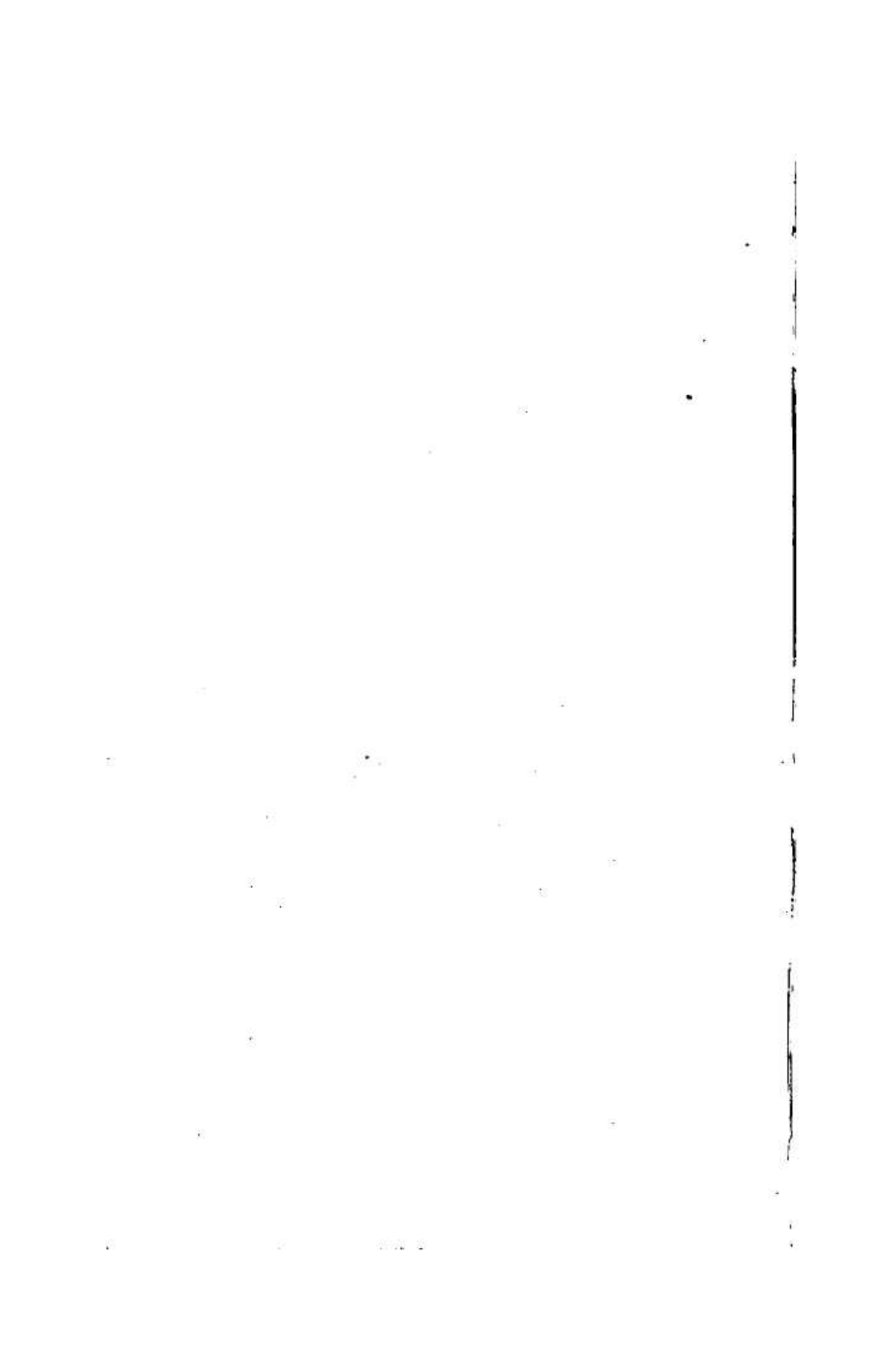
I have the Honor to be,

My Lord,

Your Lordship's greatly obliged,

and faithful

humble Servant,

Thos. Fowler.

INTRODUCTION.

THE following TABLES are Published chiefly for the purpose of facilitating the very troublesome Calculations, which occur every Quarter in making up the Accounts of POOR LAW UNIONS. Having myself been employed in the TORRINGTON UNION, to make up the Accounts, at the commencement, I found those Calculations the most troublesome part of the business, and had recourse to the common Logarithms, which certainly abridged the labour, yet even with this valuable aid I was not satisfied, and was constantly searching after some other method more simple, and of easier application;—happily, I hit on the Idea, that any Number might be produced, by a combination of the Powers of the Numbers 2 or 3, and consequently, that the same Indices of the Powers that produced any two or more Numbers, would also represent any other two or more quantities bearing the Ratios of these Numbers, one to another respectively;—I now saw that my object was attained, and that I had only to form a Table of consecutive Numbers, with the corresponding Indices of the Powers of 2 or 3 that would produce them, this was quickly done, by taking the Binary and Ternary Scales of Notation, as the foundation of my proceedings, and I was much delighted at observing the beautiful order in which the Indices introduced themselves into the Tables, and which made their construction a matter of great facility.

Since the Tables have been constructed, the Calculations for the Torrington Union have been made by one or other of them, and the Calculator finding his Work so easy, and so materially abridged, soon caused the Tables to be noticed by the Board of

Guardians, of which the NOBLEMAN, who has so kindly permitted his Name to appear on the Title Page, is Chairman;—His LORDSHIP, and the very efficient and respectable Auditor of the Union Accounts, C. W. JOHNSON, Esq. were so much pleased with this abridgement of the Calculator's Labours, that they immediately desired me to publish them.

I believe the Plan is entirely new, although the properties of the Powers of the Numbers 2 and 3, of which I have now availed myself, have always been known to Mathematicians, and doubtless, the want of some particular object for their use, such as that which is now furnished by the really beautiful mode of keeping the Accounts of Poor Law Unions, is the reason that an application so obvious and simple, has not hitherto found its way into the various Treatises on Arithmetic.

The necessary Forms of application of the Tables to some useful purposes, will be found in the proper place, and I venture to hope that an intelligent Public will favourably receive this little Work; it is published in the hope of being useful to a valuable Class of Men, by one who is well acquainted with long and laborious Calculations.

In the course of my observations on the Binary and Ternary Scales, I have fallen on a species of Binary and Ternary Arithmetic, which appears to possess some curious Properties, but, as writing on this subject is incompatible with my present purpose, I have only given a short Example of Multiplication, in what may be termed, *Ternary Arithmetic*, the process is extremely easy, and may be extended to very large Numbers.

Should the Sale of the present Edition be favourable, another will soon follow, in which the Ternary Table will appear under another Form, and extend from Unity to Numbers almost indefinitely great, and also contain some other curious and I hope, useful matter.

<div align="right">THOMAS FOWLER.</div>

Great Torrington, Devon,
November 15th. 1838.

DESCRIPTION AND USE

BINARY AND TERNARY TABLES.

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EXPLANATION OF THE SIGNS.

AS some of the common Algebraical Signs must necessarily be introduced in the description and use of the Tables, it is expedient to premise a short explanation of them.

+ *plus*, or *more*, indicates that the quantity which follows it is to be added to the quantity that precedes it.

— *minus*, or *less*, signifies that the quantity that follows it is to be subtracted from the quantity that precedes it.

× *into*, signifies that two quantities between which it is placed are to be multiplied one by the other.

÷ *by*, signifies that the quantity which precedes it is to be divided by the quantity that follows it.

= *equal to*, signifies that any two quantities between which it is placed are equal one to the other.

: :: : *is to, so is, to*, signifies that four quantities between which they are placed are proportional one to the other.

b

The *power* of any number or quantity, signifies that the number or quantity is to be multiplied by itself once or many times, thus, 2×2, $2 \times 2 \times 2$, $2 \times 2 \times 2 \times 2$, $2 \times 2 \times 2 \times 2 \times 2$, &c. are called the 2nd. 3rd. 4th. and 5th. *Powers* of 2, and are thus expressed, 2^2, 2^3, 2^4, 2^5, &c. in which the little numbers above the quantity multiplied are called *Indices*,—the first *Power* of any quantity is always the quantity itself.*

( ) *parenthesis*, signifies that any combination of quantities within it are to be taken collectively as one quantity, and be subject as one quantity to the Sign that is placed before it, and if no Sign be placed before a Parenthesis or other quantity, the Sign + is always understood to be there.

The Sign + also signifies a *positive* or *existing quantity*, and the Sign − a *Negation*, or the want of the quantity that follows it, which in Mathematical language is called a *negative quantity*.

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OF THE BINARY TABLE.

This Table extends from Page 1, to Page 16, in double Columns of consecutive Numbers from No. 1, to No. 1023, with the corresponding Indices of the Powers of 2 that produce them. Pages 17 and 18 are a continuation of the same Table, in which the Numbers proceed by large Intervals; I have called these Numbers, *Leading Numbers*, because they lead to the Indices of the Powers that produce any Number from No. 1, to No. 130048, the extent of the Table. The Leading Numbers themselves are represented by the

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* The Powers of the Numbers 2 and 3 in the following Pages, are always understood to be represented by their Indices, which are necessarily Positive, and if the Negative Sign be sometimes placed before an Index, or Indices within a Parenthesis, it means only that the *powers* or *quantities* which they represent, are Negative; an Index itself, when made Negative, has quite a different meaning, the explanation of which is not required here.