GEODÆSIA:

OR, THE

ART

OF

SURVEYING

AND

𝕸eaſuring of Land,

Made EASIE.

SHEWING,

By Plain and Practical Rules, How to Survey, Protract, Caſt up, Reduce or Divide any Piece of Land whatſoever ; with New Tables for the eaſe of the Surveyor in Reducing the Meaſures of Land.

MOREOVER,

A more Facile and Sure Way of Surveying by the Chain , than has hitherto been Taught.

AS ALSO,

How to Lay-out New Lands in 𝕬merica, or elſewhere: And how to make a Perfect Map of a River's Mouth or Harbour ; with ſeveral other Things never yet Publiſh'd in our Language.

By JOHN LOVE, -Philomath.

Oculus mentis excæcatus & defoſſus, per ſola Mathematica ſtudia inſtauratur & excitatur, ut res ipſas cernere queat, & à rerum nudis ſimulacbris ad veritatem, à tenebris ad lucem, à materiæ ſpelunca & vinculis, ad incorporeas, & inviſibiles eſſentias ſeſe erigere. Plato de Repub.

LONDON:

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TO THE

HONOURABLE

ROBERT BOYLE, Efq;

A MOST

WORTHY PROMOTER

OF ALL

Truly Ingenious Knowledg,

And one of the

MEMBERS

OF THE

𝕽𝖔𝖞𝖆𝖑 𝕾𝖔𝖈𝖎𝖊𝖙𝖞 :

This Small TREATISE of

G   E   O   D   Æ   S   I   A,

Is humbly Dedicated, by the

Meaneſt of his Servants, the Author,

J. L.

THE
PREFACE
TO THE
READER.

WHat would be more ridiculous, than for me to go about to Praife an Art that all Mankind know they cannot live Peaceably without? It is near hand as ancient (no doubt on't) as the World: For how could Men fet down to Plant, without knowing fome Diftinction and Bounds of their Land? But (Neceffity being the Mother of Invention) we find the *Egyptians*, by reafon of the *Nyles* over-flowing, which either wafht away all their Bound-Marks, or cover'd them over with Mud, brought this Meafuring of Land firft into an Art, and Honoured much the Profeffors of it. The

great

great Ufefulnefs, as well as the plea-
fant and delightful Studie, and whol-
fom Exercife of which, tempted fo
many to apply themfelves thereto, that
at length in *Egypt* (as in *Bermudas* now)
every Ruftick could Meafure his own
Land.

From *Egypt*, this Art was brought
into *Greece*, by *Thales*, and was for a
long time called *Geometry* ; but that be-
ing too comprehenfive a Name for the
Menfuration of a Superficies only, it
was afterwards called *Geodæfia* ; and
what Honour it ftill continued to have
among the Antients, needs no better
Proof than *Plato's* ἀ γεωμέτρητος ἔρδυς ἐσοίτω. And
not only *Plato*, but moft, if not all the
Learned Men of thofe times, refufed to
admit any into their Schools, that had
not been firft entred in the *Mathematicks*,
efpecially *Geometry* and *Arithmetick*. And
we may fee, the great Monuments of
Learning built on thefe Foundations,
continuing unfhaken to this day, fuf-
ficiently demonftrate the Wifdom of
the Defigners, in chufing *Geometry* for
their Ground-Plot.

Since

Since which the *Romans* have had such an Opinion of this sort of Learning, that they concluded that Man to be incapable of Commanding a Legion, that had not at least so much *Geometry* in him, as to know how to Measure a Field. Nor did they indeed either respect Priest or Physitian, that had not some Insight in the *Mathematicks*.

Nor can we complain of any failure of Respect given to this Excellent Science, by our Modern Worthies, many Noblemen, Clergymen, and Gentlemen affecting the Study thereof: So that we may safely say, none but Unadvised Men ever did, or do now speak evil of it.

Besides the many Profits this Art brings to Man, it is a Study so pleasant, and affords such Wholsom and Innocent Exercise, that we seldom find a Man that has once entred himself into the Study of *Geometry* or *Geodæsia*, can ever after wholly lay it aside; so natural it is to the Minds of Men, so pleasingly insinuating, that the *Pythagoreans* thought the Mathematicks to be only

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a Reminifcience, or calling again to mind things formerly learned.

But no longer to light Candles to fee the Sun by, let me come to my bufinefs, which is to fpeak fomething concerning the following Book ; and if you ask, why I write a Book of this nature, fince we have fo many very good ones already in our own Language ? I anfwer, becaufe I cannot find in thofe Books, many things, of great confequence, to be underftood by the Surveyor. I have feen Young men, in *America*, often nonplus'd fo, that their Books would not help them forward, particularly in *Carolina*, about Laying out Lands, when a certain quantity of Acres has been given to be laid out five or fix times as broad as long. This I know is to be laught at by a Mathematician ; yet to fuch as have no more of this Learning, than to know how to Meafure a Field, it feems a Difficult Queftion : And to what Book already Printed of Surveying fhall they repair to, to be refolved ?

Alfo concerning the *Extraction of the Square Root* ; I wonder that it has been

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fo much neglected by the Teachers of
this Art, it being a Rule of fuch abfo-
lute neceffity for the Surveyor to be
acquainted with. I have taught it
here as plainly as I could devife, and
that according to the Old way, verily
believing it to be the Beft, ufing fewer
Figures, and once well learned, charg-
ing lefs the Memory than the other
way.

Moreover, the Sounding the En-
trance of a River, or Harbour, is a
Matter of great Import, not only to
Seamen, but to all fuch as Seamen live
by; I have therefore done my endea-
vour to teach the Young Artift how
to do it, and draw a fair Draught
thereof.

Many more things have I added, fuch
as I thought to be New, and Wanting;
for which I refer you to the Book it
felf.

As for the Method, I have chofe that
which I thought to be the eafieft for a
Learner; advifing him firft to learn
fome Arithmetick, and after teaching

him

him how to Extract the Square-Root.
But I would not have any Neophyte
difcouraged, if he find the *Firſt* Chap-
ter too hard for him ; for let him ra-
ther skip it, and go to the *Second* and
Third Chapters, which he will find fo
eafie and delightful, that I am perfuaded
he will be encouraged to conquer the
Difficulty of learning that one Rule in
the *Firſt* Chapter.

From *Arithmetick*, I have proceeded
on to teach fo much *Geometry* as the Art
of *Surveying* requires. In the next place
I have fhewed by what Meafures Land
is Surveyed, and made feveral Tables
for the Reducing one fort of Meafure
into another.

From which I come to the Defcrip-
tion of Inftruments, and how to Ufe
them ; wherein I have chiefly infifted
on the Semi-circle, it being the beft that
I know of.

The *Sixth* Chapter teacheth how to
apply all the foregoing Matters toge-
ther, in the Practical Surveying of any
Field, Wood, *&c.* divers Ways, by di-
vers Inftruments ; and how to lay
down

down the fame upon Paper. Alſo at the end of this Chapter I have largely infifted on, and by new and eafie ways, taught Surveying by the Chain only.

The *Seventh, Eighth, Ninth, Tenth* and *Eleventh* Chapters, teach how to caft up the Contents of any Plot of Land ; How to lay out New Lands ; How to Survey a Mannor, County or Country : Alſo, how to Reduce, Divide Lands, *Cum multis aliis.*

The *Twelfth* Chapter confifts wholly of *Trigonometry.*

The *Thirteenth* Chapter is of Heights and Diftances, including amongft other things, how to make a Map of a River or Harbour. Alſo how to convey Water from a Spring-head, to any appointed Place, or the like.

Laftly, At the end of the Book, I have a Table of Northing or Southing, Eafting or Wefting ; or (if you pleafe to call it ſo) A Table of Difference of Latitude and departure from the Meridian, with Directions for the Uſe thereof. Alſo a Table of Sines and Tangents, and a Table of Logarithms.

I have taken Example from Mr. *Holwell* to make the Table of *Sines* and *Tangents*, but to every Fifth Minute, that being nigh enough in all fenfe and reafon for the Surveyor's Ufe; for there is no Man, with the beft Inftrument that was ever yet made, can take an Angle in the Field nigher, if fo nigh, as to Five Minutes.

All which I commend to the Ingenious Reader, wifhing he may find Benefit thereby, and defiring his favourable Reception thereof accordingly. I conclude,

<div align="center">

R E A D E R,

Your Humble Servant,

J. L.

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THE

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