I. The Barometrical Method of measuring the Height of Mountains, with two new Tables shewing the Height of the Atmosphere at given Altitudes of Mercury. Extracted chiefly from the Observations of John James Scheuchzer, M. D. Professor of Mathematicks at Zuric, and a Member of the Imperial, and Royal Societies of London and Prussia. By J. G. Scheuchzer, M. D. F. R. S. & Coll. Med. Lond. Lic.

THE Height of Mountains, and their Elevation above the Level of the Sea, hath been at all Times thought worthy the Attention of inquisitive Philosophers. We find in *Pliny* *, that *Dicæarchus*, one of the old Geographers, a Disciple of *Aristotle*, and, as *Pliny* himself stiles him, a Man of great Learning, had by particular Order of some Princes measured the Heights of several Mountains, and that the highest of them, *Mount Pelius* in *Thessalia*, was found by his Observations 1250 Paces high perpendicularly. *Cleomedes* also, a *Grecian* Astronomer and Geographer, who lived sometime before our Saviour's Nativity, asserts †, that the highest Mountain cannot be above 15 Stadia, or 9375 *Roman* Feet high.

But *Plutarch* ‡ fixes the perpendicular Height of the highest Mountains, as also the greatest Depth of the Sea, only to 10 Stadia, or 6250 *Roman* Feet. It will appear by the Sequel of this Paper, that the

* Hist. Nat. L. xi. c. 65.   † Cyclicæ Theor. Cap. x.   ‡ In vita Aemilij.

Height

Height of Mountains, as determined by thefe early
Writers, doth not fo very much deviate from Truth, as
one would be apt to fufpect from the infant State of
Arts and Sciences in thofe Times. Particularly the 15
Stadia of *Cleomedes*, which make out 9375 *Roman*,
or 10,214 *Paris* Feet, will be found by the following
Obfervations to come very near the Height of the Moun-
tains of *Swifferland*, which, although the higheft of
Europe, do not rife above 10,000 *Paris* Feet above
the Level of the Sea ; and it may feem furprizing,
that fubfequent Writers, even fuch as were otherwife
deeply skill'd in mathematical Learning, have run them
up to an extravagant, and altogether unnatural Height.

At firft, it is not improbable, they went only upon
bare Conjectures ; but afterwards, when Geometry
came to be more and more improved, Quadrants, Semi-
circles, and other Geometrical Inftruments were call'd
in Ufe, by the Means of which, and by a Trigonome-
trical Calculation, the Heights of Places could be de-
termined in a more fatisfactory Manner. And yet,
however true the Principles be, upon which this Me-
thod is founded, however nice the Inftruments, and
however curious the Obferver, the Method itfelf muft
be owned, and hath been found by undoubted Experi-
ments, to fall far fhort of that Accuracy, which it
feems to promife ; and the more confiderable the Heights
are, the more uncertain it will be. For in the firft
Place, as the State of the Air is very different in dif-
ferent Seafons and different Weather, its Refraction alfo
becomes thereby greatly altered, which occafions the
Tops of Mountains to appear higher at fome Times
than they do at others, and at all Times higher than
they actually are. But befides, there is another In-

2   conveniency,

conveniency, which whoever is acquainted with the true State of mountainous Countries, muft needs be fenfible of, and that is the extream Difficulty of meeting at the Bottom of high Mountains with Plains large enough for a proper horizontal Stand, or Bafis, to fuch a Triangle, as an accurate and knowing Obferver would think fatisfactory to determine a confiderable Height, making even proper Allowances for the Air's Refraction.

Among the many Improvements in Natural Philofophy, which are owing to the Toricellian Tube, one of the moft confiderable Inventions of the laft Century, it hath been thereby enriched with a new Method of meafuring the refpective Heights of Places, and their Elevation above the Level of the Sea; a Method, which, although it muft be owned, that it hath not as yet, and perhaps, confidering the Inconftancy of the Air, hardly ever will be brought to an abfolute Degree of Certainty, is yet in many Refpects preferable to the Trigonometrical one, as it hath alfo been found by Experience to come nearer the Truth, and leads us, by a new and fingular Scale, from the very Horizon of the Sea to the Tops of the higheft Mountains, a Diftance far beyond the Reach of Geometrical Inftruments. This new Method is grounded upon that effential Quality of the Air, its Gravity or Preffure. As the Column of Mercury in the Barometer is counterpoifed by a Column of Air of equal Weight, fo whatever Caufes will make the Air heavier or lighter, its Preffure will be thereby increafed, or leffened, and confequently the Mercury rife or fall. Again the Air is more or lefs condenfed, or expanded, in Proportion to the Weight, or Force, which preffes it: Hence it is, that

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in *England*, *Holland*, the maritime Provinces of *France*, and in general all thofe Countries which border upon the Sea, the Mercury ftands higheft, that the higher you remove from the Sea into the midland Countries, the lower the Mercury will defcend, becaufe the Air alfo becomes more rarefied and lighter, and that upon the Tops of the higheft Mountains it falls loweft, and thefe Heights of the Mercury in different Places are reciprocally, as the Expanfions of the Air. From thefe Principles, fupported by a competent Number of Ob-fervations, it hath been attempted by feveral learned Men, to derive proper Tables, whereby the Height of any Place may be determined, if the Height of the Barometer be given, or the Height of the Barometer determined from the given Altitude of the Place, and likewife the Expanfions of the Air fettled, as they an-fwer to every Inch, or Part of an Inch, in the Baro-meter.

I pafs over the firft Experiment of this Kind, which was made in the Year 1648 (but a few Years after the Invention of the Torricellian Tube was made publick in *France* by Father *Merfenne*) by Monfieur *Perier*, according to the Directions of the celebrated Monfieur *Pafcal*, his Brother-in-Law, upon the high Mountain *Puy de Domme*, near *Clermont* in *Auvergne*, the Height whereof was thereby determined to 500 *French* Toifes, or 3000 *Paris* Feet. (See the Appendix to *M. Pafcal's Traitè de l' Equilibre des Liqueurs **.) Nor will my prefent Purpofe admit a particular Enu-meration of thofe made fometime after, in 1661, 1665, and 1666, by *George Sinclair*, Profeffor of Philofo-phy in the Univerfity of *Glafgow*, upon the Cathe-

* *Paris*, 1663, 8*vo. pag.* 177.

dral of that Univerfity, upon feveral high Mountains
in *Scotland*, and likewife in fome Wells and Coal-pits,
a particular Account whereof he inferted in his *Ars
magna gravitatis & levitatis* *. I will only obferve,
that thefe Experiments of *Sinclair*, as well as that of
Monfieur *Perier*, were intended not fo much to lay
the Foundation of a Calculation, whereby to determine
the differing Heights of Places, as to prove the Gra-
vity and Preffure of the Air, a Problem very much
controverted at that Time, and to fhew, that the fame
is much more confiderable in Valleys than at the Top
of Mountains, and ftill greater in Proportion at the Bot-
tom of Wells, Mines, &c.

But this Matter was purfued ftill farther by the
Members of the Royal Academy of Sciences at *Paris*,
particularly, when by Order of *Lewis* XIV, they
drew that expenfive *Meridian* Line acrofs the whole
Kingdom of *France. M. Mariotte*, a celebrated Mem-
ber of that Academy, was one of the firft that laid
down certain Rules for the Conftruction of fuch Tables,
as might ferve to determine both the Elevation of Places
above the Level of the Sea from given Altitudes of
Mercury, and the Heights of the Air, anfwering to every
Line of Mercury in the Barometer, from 28 ′′, where
the Mercury was fuppofed to ftand at a Medium near
the Sea. The Principles he went upon, and the Me-
thod he followed, he difcourfed of at large, in his
Second Effay de la Nature de l' Air.

Sometime after, in 1686, the ingenious Dr. *Edmund
Halley* went about another Calculation, which he de-
rived partly from Principles agreeing with thofe of

* Roterodami, 1669, 4to. pag. 129, 132, 134, 144, & feq.

M. Ma-

M. Mariotte, partly from the fpecifick Weight of Air and Mercury, which were found by Experiment to be as 1 to 10,800 ; Air being to Water as 1 to 800, and Water to Mercury as 1 to 13 $\frac{1}{2}$, or very near it. If fo, as the Column of Mercury in the Barometer is counterpoifed by a Column of Air of equal Weight, a Cylinder of Air of 10,800 Inches, or 900 Feet will be equal to one Inch of Mercury, and 90 Feet to $\frac{1}{10}$ of an Inch, or 75 to $\frac{1}{12}$ Part of it. The Height of the Air, as it anfwers to one Inch of Mercury, being thus determined, and the Expanfions of the Air being reciprocally as the Heights of Mercury, Dr. *Halley*, by the Help of the Hyperbola and its Afymptotes, calculated two Tables, one fhewing the Altitude to given Heights of Mercury, the other the Heights of Mercury at given Altitudes. Thefe Tables, the firft that ever were calculated, together with the Doctor's whole Method of proceeding, and an ingenious Attempt of his to difcover the true Reafon of the Rife and Fall of Mercury upon Change of Weather, were printed in the *Philofophical Tranfactions* *, and the Tables themfelves were very lately re-printed, with fome Obfervations upon them, by Dr. *Defaguliers* †.

In the Year 1703, when the *Meridian* Line, firft begun by *M. Picard* in 1669, afterwards continued in 1683, was farther purfued, feveral Obfervations of this Kind were made, and the Heights of feveral confiderable Mountains, particularly in the Southern Parts of *France*, determined as well by Trigonometrical as Barometrical Obfervations. Monfieur *Caffini* the Younger took that Opportunity to compare thefe Obfervations

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* N° 181. *pag.* 106;   † Phil. Tranfact. N° 386.

<div align="right">with</div>

with the Rules laid down by *M. Mariotte* *, in or-
der to which, and conform to the faid Rules, he cal-
culated two Tables, one fhewing the Height of the At-
mofphere ,as it anfwers to every Line of Mercury in
the Barometer, the other determining the Height of the
Atmofphere above the Level of the Sea at given Alti-
tudes of Mercury. But having afterwards, upon Com-
parifon, found that the Obfervations made in 1703, did
not in the Main agree with the Rules of *M. Mariotte*,
and that the Heights of Places, as they appeared by
thofe Obfervations, exceeded, generally fpeaking, the
Numbers refulting from the Tables made by him ac-
cording to the faid Rules, he thought it neceffary to
calculate two new ones, wherein indeed the Refults
are confiderably greater than in the Tables framed ac-
cording to the Rules of *M. Mariotte*; infomuch, that
for Inftance, a Place, where the Mercury falls to 22
Inches, rifes above the Level of the Sea, according to
Mariotte, 852 Toifes, or 5112 *Paris* Feet; and, ac-
cording to *Caffini*, 1158 Toifes, or 6948 Feet, which
makes a Difference of 1836 *Paris* Feet, or 306 Toifes.
Dr. *Defaguliers*, in his Differtation concerning the Fi-
gure of the Earth †, hath already fhewn how far the
Obfervations made by the Gentlemen, that drew the
Meridian acrofs the Kingdom of *France*, differ from
each other; infomuch, that there are not two in nine,
where the Number of Toifes, faid to correfpond to the
Heights of the Barometer, agree together; and that con-
fequently the Heights of Mountains, as determined by
thefe Obfervations, are little to be depended on.

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* Memoires de l' Acad. Royale, 1705. *pag.* 61. & feq. † Phil. Tranf.
N° 386. *pag.* 211.

My

My Father, Dr. *J. J. Scheuchzer*, in his Journeys over the Mountains of *Swiſſerland*, as they were more particularly calculated for the Improvement of Natural Philoſophy in its ſeveral Branches, neglected no Opportunity, along with his other Obſervations, to make ſuch Experiments with the Barometer, as might ſerve to illuſtrate the Qualities of the Air, to ſettle the reſpective Heights of Places, and particularly to ſhew, how much our Mountains riſe, as well above the Level of the Sea, as above other neighbouring Mountains in *France, Italy, Spain,* &c. Many of theſe Obſervations are ſcattered up and down in his Writings, particularly his *Itinera Alpina,* and the ſeveral Parts of his *Natural Hiſtory of Swiſſerland,* which laſt Work was publiſhed in *High German.* It would be too tedious to mention all the Experiments he made at different Times, and upon different Mountains. But my Deſign in this Paper requires me to be particular in one, which for the Height meaſured both with the Line and Barometer is, I believe, the moſt conſiderable that ever was made, and which enabled him more particularly to examine the two Tables made by *Caſſini* the Younger, according to the Rules of Mr. *Mariotte,* and the Obſervations made by him and others, when the *Meridian* Line was perfected in 1703.

This curious Experiment was made in the Year 1709, at *Pfeffers,* a celebrated Mineral Water in the County of *Sargans,* at the Bottom and Top of a Mountain, which riſes from a ſmall Brook, called the *Taminna,* to the Height of 714 *Paris* Feet, as appeared by letting a Line drop down perpendicularly from a Tree at Top full to the Bottom. At the Bottom of this Mountain, near the *Taminna,* the Mercury was by repeated Experiments

periments obſerved at 25″, 9⅓‴, and at the Top it
deſcended to 24″, 11⅓‴, ſo that it fell juſt 10 Lines,
for 714 Feet, which gives about 71 *Paris* Feet for a
Line, if the Heights anſwering to every Line were ſup-
poſed to be equal.

I muſt here once for all deſire the Reader to take
Notice, that I have made uſe in this Paper of *Paris*
Meaſure, namely, of Toiſes (°) Feet (′) Inches (″)
and Lines (‴). Every Toiſe is reckoned at ſix Foot,
the Foot is divided into twelve Inches, and the Inch
into twelve Lines.

The Heights of the Barometer at the Bottom and
Top of the Mountain being thus given, the Height of it
ſhould be, according to *M. Mariotte*, 116°, 0′, 8″, 11‴,
or 696 *Paris* Feet, 8″, 11‴, which falls 17′, 3″, 1‴,
ſhort of the true Height, and according to *Caſſini* 153°
3′, 8″, that is, 921 *Paris* Feet, 8″, which exceeds
the true Height by 207 *Paris* Feet, 8 Inches ; whereby
it appears, that the Table made according to the Rules
of *Mariotte* is much preferable to that of *Caſſini* the
Younger. The ſame was likewiſe confirmed by ano-
ther Experiment made in *June* 1715, upon the Steeple
of our Cathedral at *Zurich.* At the Foot of the
Steeple the Barometer ſtood at 26″, 10‴, and at the
Top at 26″, 7½‴, and the Height of the Steeple was
found by the Line of 241 *Paris* Feet, 4 Inches, which
gives very near 69 *Paris* Feet for one Line. Accord-
ing to the Table of *Mariotte*, the Height of the Steeple
ſhould have been of 237 *Paris* Feet, according to
Caſſini, 265, and according to the new Calculation (of
which by and by) made purſuant to the Experiments
above, it comes to 243°, 16″, 2‴, or about two Foot
more than the true Height.

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It

It appearing by the Experiments made at *Pfeffers*, that from 25″, 9⅓‴ the Barometer defcends to 24″, 11⅓‴, that is, juft 10 Lines, for the Height of 714 Feet, and the Expanfions of the Air being reciprocally as the Heights of Mercury, my Uncle, Dr. *John Scheuchzer*, undertook, purfuant to thefe Principles, and the Properties of the Hyperbola, to calculate a new Table, after the following Method.

As the Difference of the Logarithms of the two given Heights of the Barometer 25″ 9⅓‴ and 24″ 11⅓‴, that is 309⅓ and 299 ′, or

Is to Foot,

So the Difference of the Logarithms of the Height of Mercury near the Sea, 28″ 1‴ to any leffer Height, as for Inftance 28″ 0‴, that is 337 — 336, or

To the Height of the Atmofphere above the Level of the Sea, as it anfwers to one Line of Mercury, is

928 — 898
142717

714

1011 — 1008
12906

64′, 6″, 9‴

Thus the Height of the Atmofphere at 28″ appears to be of 10°, 4′, 6″, 9‴, but, according to *Mariotte*, it is only of 10°, 3′, or 63 Feet, and *Caffini* fuppofes it only at 10°, or 60 Foot.

In like Manner the Height of the Atmofphere, from 28″, 0‴, to 27″, 11‴ is found to be 64′, 9″, 2‴. According to the fame Rule half the Height of the Atmofphere, that is, the Height of the Place, where the Mercury in the Barometer would defcend to 14 Inches, appears to be, 15060′, 3″, 0‴, or 2510°, 0′, 3″, 0‴. Still upon the fame Principle the Mercury will defcend to one Line at the Height of 133,397 *Paris* Feet above the Level of the Sea, which make 22,232 Toifes,

5 Feet,

5 Feet, or 11 *Paris* Miles (at 2000 Toifes the Mile) 232 Toifes, 5 Foot. But as in order to determine the whole Height of the Atmofphere, the Logarithm of $1'''$ ought to be deducted from the Logarithm of $336'''$ or $28''$ $0'''$, and as that Logarithm is 00000, it follows from thence, that beyond the Place, where the Mercury would defcend to $1'''$, the Air is expanded into an Indefinite Space.

For the Satisfaction of the Curious, I have added the Tables themfelves, to wit, thofe which *Caffini* the Younger calculated according to the Rules of *Mariotte*, thofe which he deduced from the Obfervations made by the Gentlemen of the Royal Academy of Sciences, who drew the *Meridian* Line, and thofe which my Uncle calculated from the Obfervation made at *Pfeffers* in 1709.

In another Paper on this Subject I intend to compare the Height of Mountains, as determined by divers antient and modern Writers, with the true Height of them, as it appears to be by the Barometrical Obfervations, particularly thofe made by my Father on the high Mountains of *Swifferland*.

II. *Obfervations of a Difference of Sex in* Mifleto, *in a Letter from the* Reverend *Mr.* Edmund Barrel *to Sir* Hans Sloane, *Bart.* &c.

S I R,

AFTER I had mentioned my being pretty well affured, that the Plants of Mifleto were fome of them Male, and fome Female; and had promifed to

com-

Left Table

The Fall of Mercury in the Barometer ''	'''	The Height of the Atmosphere, as it answers to every Line in the Barometer, according to Mariotte °	'	''	'''	According to Cassini °	'	According to Dr. Scheuchzer °	'	''	'''
0	0	10	3	0	0	10	0	10	4	6	9
	1	10	3	2	3	10	1	10	4	9	2
	2	10	3	4	6	10	2	10	4	11	5
	3	10	3	6	10	10	3	10	5	1	1
	4	10	3	9	1	10	4	10	5	4	1
	5	10	3	11	4	10	5	10	5	6	6
	6	10	4	1	9	11	0	10	5	8	11
	7	10	4	4	1	11	1	10	5	11	3
	8	10	4	6	5	11	2	10	6	1	8
	9	10	4	8	10	11	3	11	0	4	1
	10	10	4	11	2	11	4	11	0	6	6
	11	10	5	1	7	11	5	11	0	8	11
1	0	10	5	4	0	12	0	11	0	11	4
	1	10	5	6	5	12	1	11	1	1	10
	2	10	5	8	10	12	2	11	1	4	4
	3	10	5	11	1	12	3	11	1	6	10
	4	11	0	1	9	12	4	11	1	9	5
	5	11	0	4	3	12	5	11	2	0	0
	6	11	0	6	9	13	0	11	2	2	7
	7	11	0	9	3	13	1	11	2	5	2
	8	11	0	11	10	13	2	11	2	7	9
	9	11	1	2	4	13	3	11	2	10	4
	10	11	1	4	11	13	4	11	3	1	0
	11	11	1	7	7	13	5	11	3	6	4
2	0	11	1	10	2	14	0	11	3	9	0
	1	11	2	0	9	14	1	11	3	11	8
	2	11	2	3	4	14	2	11	4	2	4
	3	11	2	6	0	14	3	11	4	5	0
	4	11	2	8	8	14	4	11	4	7	8
	5	11	2	11	4	14	5	11	4	10	4
	6	11	3	2	1	15	0	11	5	1	0
	7	11	3	4	10	15	1	11	5	3	9
	8	11	3	7	7	15	2	11	5	6	7
	9	11	3	10	4	15	3	11	5	9	5
	10	11	4	1	1	15	4	12	0	0	5
	11	11	4	3	11	15	5	12	0	3	5
3	0	11	4	6	9	16	0	12	0	6	6
	1	11	4	9	6	16	1	12	0	9	8
	2	11	5	0	4	16	2	12	1	0	10
	3	11	5	3	3	16	3	12	1	4	0
	4	11	5	6	2	16	4	12	1	7	2
	5	11	5	9	1	16	5	12	1	10	4
	6	12	0	0	0	17	0	12	2	1	6
	7	12	0	2	11	17	1	12	2	4	8
	8	12	0	5	11	17	2	12	2	8	0
	9	12	0	8	11	17	3	12	2	11	2
	10	12	0	11	11	17	4	12	3	2	4
	11	12	1	2	11	17	5	12	3	5	8
4	0	12	1	6	0	18	0	12	3	8	10
	1	12	1	9	1	18	1	12	4	0	0
	2	12	2	0	2	18	2	12	4	3	2
	3	12	2	3	3	18	3	12	4	6	4
	4	12	2	6	5	18	4	12	4	9	6
	5	12	2	9	7	18	5	12	5	0	8
	6	12	3	0	9	19	0	12	5	3	10
	7	12	3	3	11	19	1	12	5	7	0

Right Table

The Height of the Atmosphere above the Level of the Sea, according to Mariotte °	'	''	'''	According to Cassini '	''	According to Dr. Scheuchzer °	'	''	'''	Height of the Mercury in the Barometer ''	'''
0	0	0	0	0	0	0	0	0	0	28	0
10	3	2	3	10	1	10	4	9	2	—	11
21	0	6	9	20	3	21	3	8	7	—	10
31	4	1	7	31	0	32	2	9	8	—	9
42	1	10	8	41	4	43	2	1	9	—	8
52	5	10	0	52	3	54	1	8	3	—	7
63	3	11	9	63	3	65	1	5	2	—	6
74	2	3	10	74	4	76	1	4	5	—	5
85	0	10	3	86	0	87	1	6	1	—	4
95	5	7	1	97	3	98	1	10	2	—	3
106	4	6	3	109	1	109	2	4	8	—	2
117	3	7	10	121	0	120	3	1	7	—	1
128	2	11	10	133	0	131	4	0	11	27	0
139	2	6	3	145	1	142	5	2	9	—	11
150	2	3	11	157	3	154	0	7	1	—	10
161	2	2	5	170	0	165	2	1	11	—	9
172	2	4	2	182	4	176	3	11	4	—	8
183	2	8	5	195	3	187	5	11	4	—	7
194	3	3	2	208	3	199	2	1	11	—	6
205	4	0	5	221	4	210	4	7	1	—	5
216	5	0	3	235	0	221	1	2	10	—	4
228	0	2	7	248	3	233	4	2	2	—	3
239	1	7	6	262	1	245	1	3	2	—	2
250	3	3	1	276	0	256	4	9	6	—	1
261	5	1	3	290	0	268	2	6	6	26''	0
273	1	2	0	304	1	280	0	6	2	—	11
284	3	5	4	318	3	291	4	8	6	—	10
295	5	11	4	333	0	303	3	1	6	—	9
307	2	8	0	347	4	315	1	9	2	—	8
318	5	7	4	362	3	327	0	7	6	—	7
330	2	9	5	377	3	338	5	8	6	—	6
342	0	2	3	392	4	350	5	0	5	—	5
353	3	9	10	408	0	362	4	7	0	—	4
365	1	8	2	423	3	374	4	4	5	—	3
376	5	9	3	439	1	386	4	4	10	—	2
388	4	1	2	455	0	398	4	8	3	—	1
400	2	7	11	471	0	410	5	2	9	25	0
412	1	5	5	487	1	423	0	0	5	—	11
424	0	5	9	503	3	435	1	1	3	—	10
435	5	9	0	520	0	447	2	5	3	—	9
447	5	3	2	536	4	459	4	0	5	—	8
459	5	0	3	553	3	471	5	10	9	—	7
471	5	0	3	570	3	484	2	0	3	—	6
483	5	3	2	587	4	496	4	4	11	—	5
495	5	9	1	605	0	509	1	0	11	—	4
508	0	6	0	622	0	521	4	0	1	—	3
520	1	5	11	640	1	534	1	2	5	—	2
532	2	8	10	658	0	546	4	8	1	—	1
544	2	3	10	676	0	559	2	4	11	24	0
556	5	11	11	694	1	572	0	4	11	—	11
569	2	0	1	712	3	584	4	8	1	—	10
581	4	3	4	731	0	597	3	2	5	—	9
594	0	9	9	749	4	610	1	11	11	—	8
606	3	7	4	768	3	623	1	0	7	—	7
619	0	1	1	787	3	636	0	4	5	—	6
631	4	0	0	806	4	648	5	11	5	—	5

5	12	2	9	7	18	5	12	5	0	8
6	12	3	0	9	19	0	12	5	3	10
7	12	3	3	11	19	1	12	5	7	0
8	12	3	7	2	19	2	12	5	10	2
9	12	3	10	5	19	3	13	0	1	4
10	12	4	1	9	19	4	13	0	4	6
11	12	4	5	0	19	5	13	0	7	8
5/0	12	4	8	4	20	0	13	0	10	10
1	12	4	11	8	20	1	13	1	2	3
2	12	5	3	0	20	2	13	1	5	8
3	12	5	6	5	20	3	13	1	9	1
4	12	5	9	10	20	4	13	2	0	6
5	13	0	1	4	20	5	13	2	4	2
6	13	0	4	9	21	0	13	2	7	10
7	13	0	8	3	21	1	13	2	10	6
8	13	0	11	10	21	2	13	3	3	2
9	13	1	3	4	21	3	13	3	6	10
10	13	1	6	11	21	4	13	3	10	6
11	13	1	10	6	21	5	13	4	2	2
6/0	13	2	2	2	22	0	13	4	5	10
1	13	2	5	10	22	1	13	4	9	6
2	13	2	9	6	22	2	13	5	1	2
3	13	3	1	3	22	3	13	5	4	10
4	13	3	5	2	22	4	13	5	8	6
5	13	3	8	9	22	5	14	0	0	2
6	13	4	0	7	23	0	14	0	4	2
7	13	4	4	5	23	1	14	0	8	3
8	13	4	8	3	23	2	14	1	0	4
9	13	5	0	1	23	3	14	1	4	5
10	13	5	4	0	23	4	14	1	8	6
11	13	5	8	0	23	5	14	2	0	7
7/0	14	0	0	0	24	0	14	2	4	8
1	14	0	4	0	24	1	14	2	8	9
2	14	0	8	0	24	2	14	3	0	10

606	3	7	4	768	3	623	1	0	7	—	7
619	0	1	1	787	3	636	0	4	5	—	6
631	4	0	0	806	4	648	5	11	5	—	5
644	1	7	2	826	0	661	5	9	7	—	4
656	5	5	7	845	3	674	5	10	11	—	3
669	3	7	4	865	1	688	0	3	5	—	2
682	2	0	4	885	0	701	0	11	1	—	1
695	0	8	8	905	0	714	1	9	11	23	0
707	5	8	4	925	1	727	3	0	2	—	11
720	4	11	4	945	3	740	4	5	10	—	10
733	4	3	9	966	0	754	0	2	11	—	9
746	4	3	7	986	4	767	2	3	5	—	8
759	4	4	11	1007	3	780	4	7	7	—	7
772	4	9	8	1028	3	794	1	3	5	—	6
785	5	5	11	1049	4	807	4	1	11	—	5
799	0	5	9	1071	0	821	1	5	1	—	4
812	1	9	5	1092	3	834	4	11	11	—	3
825	3	4	0	1114	1	848	2	10	5	—	2
836	5	2	6	1136	0	862	1	0	7	—	1
852	1	4	8	1158	0	875	5	6	5	22	0
865	3	10	0	1180	1	889	4	4	11	—	11
879	0	8	0	1202	3	903	3	6	1	—	10
892	3	9	3	1225	0	917	2	10	11	—	9
906	1	2	5	1247	4	931	2	7	5	—	8
919	4	11	2	1270	3	945	2	7	7	—	7
932	2	11	9	1293	3	959	2	11	9	—	6
947	1	4	2	1316	4	973	3	8	0	—	5
961	0	0	5	1340	0	987	4	8	4	—	4
974	5	0	6	1363	3	1002	0	0	9	—	3
988	4	4	6	1387	1	1016	1	9	3	—	2
1002	4	0	6	1411	0	1030	3	9	10	—	1
1016	4	0	6	1435	0	1044	0	2	6	21	0
1030	4	4	6	1459	1	1058	2	11	3	—	11
1044	5	0	6	1483	3	1073	0	0	1	—	10

TABLES of the Height of the ATMOSPHERE to given Altitudes of *Mercury.*

The Fall of Mercury in the Barometer		The Height of the Atmosphere, as it answers to every Line in the Barometer, according to *Mariotte*				According to *Cassini*		According to Dr. *Scheuchzer*			
''	'''	°	'	''	'''	°	'	°	'	''	'''
0	0	10	3	0	0	10	0	10	4	6	9
	1	10	3	2	3	10	1	10	4	9	2
	2	10	3	4	6	10	2	10	4	11	5
	3	10	3	6	10	10	3	10	5	1	1
	4	10	3	9	1	10	4	10	5	4	1
	5	10	3	11	4	10	5	10	5	6	6
	6	10	4	1	9	11	0	10	5	8	11
	7	10	4	4	1	11	1	10	5	11	3
	8	10	4	6	5	11	2	10	0	1	8
	9	10	4	8	10	11	3	11	0	4	1
	10	10	4	11	2	11	4	11	0	6	6
	11	10	5	1	7	11	5	11	0	8	11
1	0	10	5	4	0	12	0	11	0	11	4
	1	10	5	6	5	12	1	11	1	1	10
	2	10	5	8	10	12	2	11	1	4	4
	3	10	5	11	1	12	3	11	1	6	10
	4	11	0	1	9	12	4	11	1	9	5
	5	11	0	4	3	12	5	11	2	0	0
	6	11	0	6	9	13	0	11	2	2	7
	7	11	0	9	3	13	1	11	2	5	2
	8	11	0	11	10	13	2	11	2	7	9
	9	11	1	2	4	13	3	11	2	10	4
	10	11	1	4	11	13	4	11	3	1	0
	11	11	1	7	7	13	5	11	3	6	4
2	0	11	1	10	2	14	0	11	3	9	0
	1	11	2	0	9	14	1	11	3	11	8
	2	11	2	3	4	14	2	11	4	2	4
	3	11	2	6	0	14	3	11	4	5	0
	4	11	2	8	8	14	4	11	4	7	8
	5	11	2	11	4	14	5	11	4	10	4
	6	11	3	2	1	15	0	11	5	1	0
	7	11	3	4	10	15	1	11	5	3	9
	8	11	3	7	7	15	2	11	5	6	7
	9	11	3	10	5	15	3	11	5	9	5
	10	11	4	1	1	15	4	12	0	0	5
	11	11	4	3	11	15	5	12	0	3	5
3	0	11	4	6	9	16	0	12	0	6	6
	1	11	4	9	6	16	1	12	0	9	8
	2	11	5	0	4	16	2	12	1	0	10
	3	11	5	3	3	16	3	12	1	4	0
	4	11	5	6	2	16	4	12	1	7	2
	5	11	5	9	1	16	5	12	1	10	4
	6	12	0	0	0	17	0	12	2	1	6
	7	12	0	2	11	17	1	12	2	4	8
	8	12	0	5	11	17	2	12	2	8	0
	9	12	0	8	11	17	3	12	2	11	2
	10	12	0	11	11	17	4	12	3	2	4
	11	12	1	2	11	17	5	12	3	5	8
4	0	12	1	6	0	18	0	12	3	8	10
	1	12	1	9	1	18	1	12	4	0	0
	2	12	2	0	2	18	2	12	4	3	2
	3	12	2	3	3	18	3	12	4	6	4
	4	12	2	6	5	18	4	12	4	9	6
	5	12	2	9	7	18	5	12	5	0	8
	6	12	3	0	9	19	0	12	5	3	10
	7	12	3	3	11	19	1	12	5	7	0
	8	12	3	7	2	19	2	12	5	10	2
	9	12	3	10	5	19	3	13	0	1	4
	10	12	4	1	9	19	4	13	0	4	6
	11	12	4	5	0	19	5	13	0	7	8
5	0	12	4	8	4	20	0	13	0	10	10
	1	12	4	11	8	20	1	13	1	2	3
	2	12	5	3	0	20	2	13	1	5	8
	3	12	5	6	5	20	3	13	1	9	1
	4	12	5	9	10	20	4	13	2	0	6
	5	13	0	1	4	20	5	13	2	4	2
	6	13	0	4	9	21	0	13	2	7	10
	7	13	0	8	3	21	1	13	2	10	6
	8	13	0	11	10	21	2	13	3	3	2
	9	13	1	3	4	21	3	13	3	6	10
	10	13	1	6	11	21	4	13	3	10	6
	11	13	1	10	6	21	5	13	4	2	2
6	0	13	2	2	2	22	0	13	4	5	10
	1	13	2	5	10	22	1	13	4	9	6
	2	13	2	9	6	22	2	13	5	1	2
	3	13	3	1	3	22	3	13	5	4	10
	4	13	3	5	2	22	4	13	5	8	6
	5	13	3	8	9	22	5	14	0	0	2
	6	13	4	0	7	23	0	14	0	4	7
	7	13	4	4	5	23	1	14	0	8	5
	8	13	4	8	3	23	2	14	1	0	4
	9	13	5	0	1	23	3	14	1	4	5
	10	13	5	4	0	23	4	14	1	8	6
	11	13	5	8	0	23	5	14	2	0	7
7	0	14	0	0	0	24	0	14	2	4	8
	1	14	0	4	0	24	1	14	2	8	9
	2	14	0	8	0	24	2	14	3	0	10

The Height of the Atmosphere above the Level of the Sea, according to *Mariotte*				According to *Cassini*		According to Dr. *Scheuchzer*				Height of the Mercury in the Barometer	
°	'	''	'''	'	''	°	'	''	'''	''	'''
0	0	0	0	0	0	0	0	0	0	28	0
10	3	2	3	10	1	10	4	9	2	—	11
21	0	6	9	20	3	21	3	8	7	—	10
31	4	1	7	31	0	32	2	9	8	—	9
42	1	10	8	41	4	43	2	1	9	—	8
52	5	10	0	52	3	54	1	8	3	—	7
63	3	11	9	63	3	65	1	5	2	—	6
74	2	3	10	74	4	76	1	4	5	—	5
85	0	10	3	86	0	87	1	6	1	—	4
95	5	7	1	97	3	98	1	10	2	—	3
106	4	6	3	109	1	109	2	4	8	—	2
117	3	7	10	121	0	120	3	1	7	—	1
128	2	11	10	133	0	131	4	0	11	27	0
139	2	6	3	145	1	142	5	2	9	—	11
150	2	3	5	157	3	154	0	7	1	—	10
161	2	2	5	170	0	165	2	1	11	—	9
172	2	4	2	182	4	176	3	11	4	—	8
183	2	8	5	195	3	187	5	11	4	—	7
194	3	3	2	208	3	199	2	1	11	—	6
205	4	0	5	221	4	210	4	7	1	—	5
216	5	0	3	235	0	221	1	2	10	—	4
228	0	2	7	248	3	233	4	2	2	—	3
239	1	7	6	262	1	245	1	3	2	—	2
250	3	3	1	276	0	256	4	9	6	—	1
261	5	1	3	290	0	268	2	6	6	26	0
273	1	2	0	304	1	280	0	6	2	—	11
284	3	5	4	318	3	291	4	8	6	—	10
295	5	11	4	333	0	303	3	1	6	—	9
307	2	8	0	347	4	315	1	9	2	—	8
318	5	7	4	362	3	327	0	7	6	—	7
330	2	9	5	377	3	338	5	8	6	—	6
342	0	2	3	392	4	350	5	0	5	—	5
353	3	9	10	408	0	362	4	7	0	—	4
365	1	8	2	423	3	374	4	4	5	—	3
376	5	9	3	439	1	386	4	4	10	—	2
388	4	1	2	455	0	398	4	8	3	—	1
400	2	7	11	471	0	410	5	2	9	25	0
412	1	5	5	487	1	423	0	0	5	—	11
424	0	5	9	503	3	435	1	1	3	—	10
435	5	9	0	520	0	447	2	5	3	—	9
447	5	3	2	536	4	459	4	0	5	—	8
459	5	0	3	553	3	471	5	10	9	—	7
471	5	0	3	570	3	484	2	0	3	—	6
483	5	3	2	587	4	496	4	4	11	—	5
495	5	9	1	605	0	509	1	0	11	—	4
508	0	6	0	622	3	521	4	0	1	—	3
520	1	5	11	640	1	534	1	2	5	—	2
532	2	8	10	658	0	546	4	8	1	—	1
544	2	3	10	676	0	559	2	4	11	24	0
556	5	11	11	694	1	572	0	4	11	—	11
569	2	0	1	712	3	584	4	8	1	—	10
581	4	3	4	731	0	597	3	2	5	—	9
594	0	9	9	749	4	610	1	11	11	—	8
606	3	7	4	768	3	623	1	0	7	—	7
619	0	1	1	787	3	636	0	4	5	—	6
631	4	0	0	806	4	648	5	11	5	—	5
644	1	7	2	826	0	661	5	9	7	—	4
656	5	5	7	845	3	674	5	10	11	—	3
669	3	7	4	865	1	688	0	3	5	—	2
682	2	0	4	885	1	701	0	11	1	—	1
695	0	8	8	905	0	714	1	9	11	23	0
707	5	8	4	925	1	727	3	0	2	—	11
720	4	11	4	945	3	740	4	5	10	—	10
733	4	3	9	966	0	754	0	2	11	—	9
746	4	3	7	986	4	767	2	3	5	—	8
759	4	4	11	1007	3	780	4	7	7	—	7
772	4	9	8	1028	3	794	1	3	5	—	6
785	5	5	11	1049	4	807	4	1	11	—	5
799	0	5	9	1071	0	821	1	5	1	—	4
812	1	9	5	1092	3	834	4	11	11	—	3
825	3	4	0	1114	1	848	2	10	5	—	2
836	5	2	6	1136	0	862	1	0	7	—	1
852	1	4	8	1158	0	875	5	6	5	22	0
865	3	10	0	1180	1	889	4	4	11	—	11
879	0	8	0	1202	3	903	3	6	1	—	10
892	3	9	3	1225	0	917	2	10	11	—	9
906	1	2	5	1247	4	931	2	7	5	—	8
919	4	11	2	1270	3	945	2	7	7	—	7
932	2	11	9	1293	3	959	2	11	9	—	6
947	1	4	2	1316	4	973	3	8	0	—	5
961	0	0	5	1340	0	987	4	8	4	—	4
974	5	0	5	1363	3	1002	0	0	9	—	3
988	4	4	6	1387	0	1016	1	9	3	—	2
1002	4	0	6	1411	0	1030	3	9	10	—	1
1016	4	0	6	1435	0	1044	0	2	6	21	0
1030	4	4	6	1459	1	1058	2	11	3	—	11
1044	5	0	6	1483	3	1073	0	0	1	—	10