



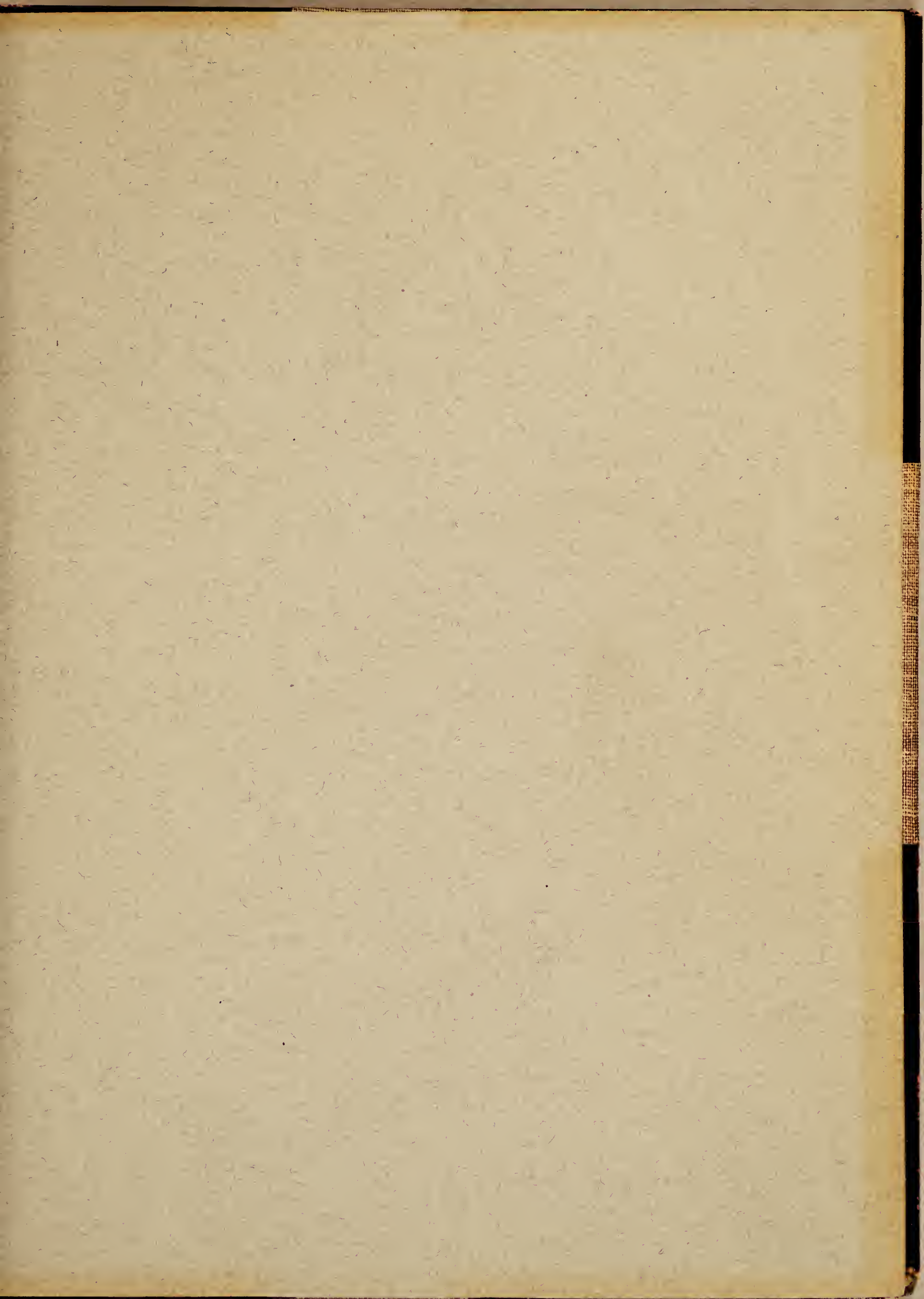
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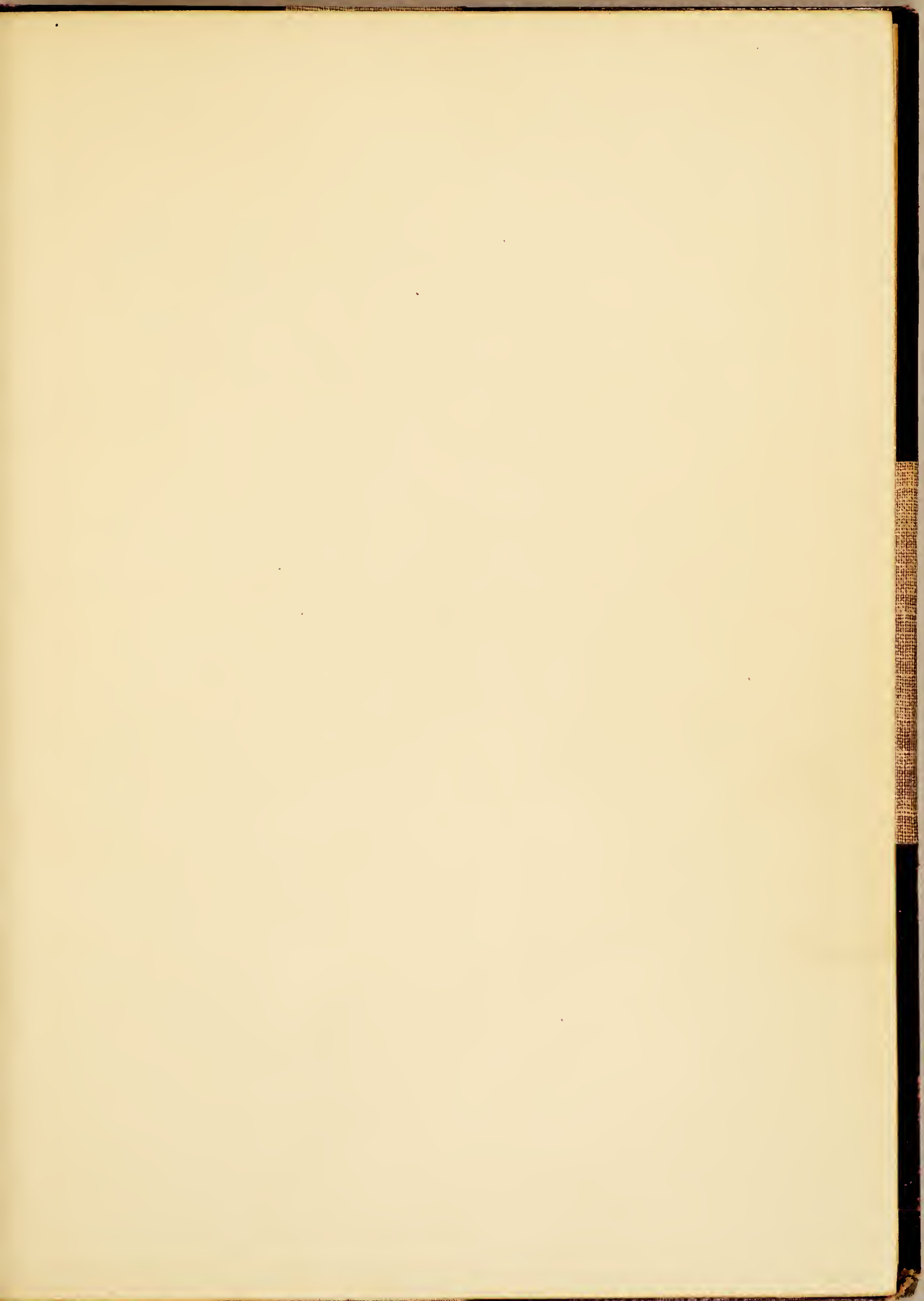
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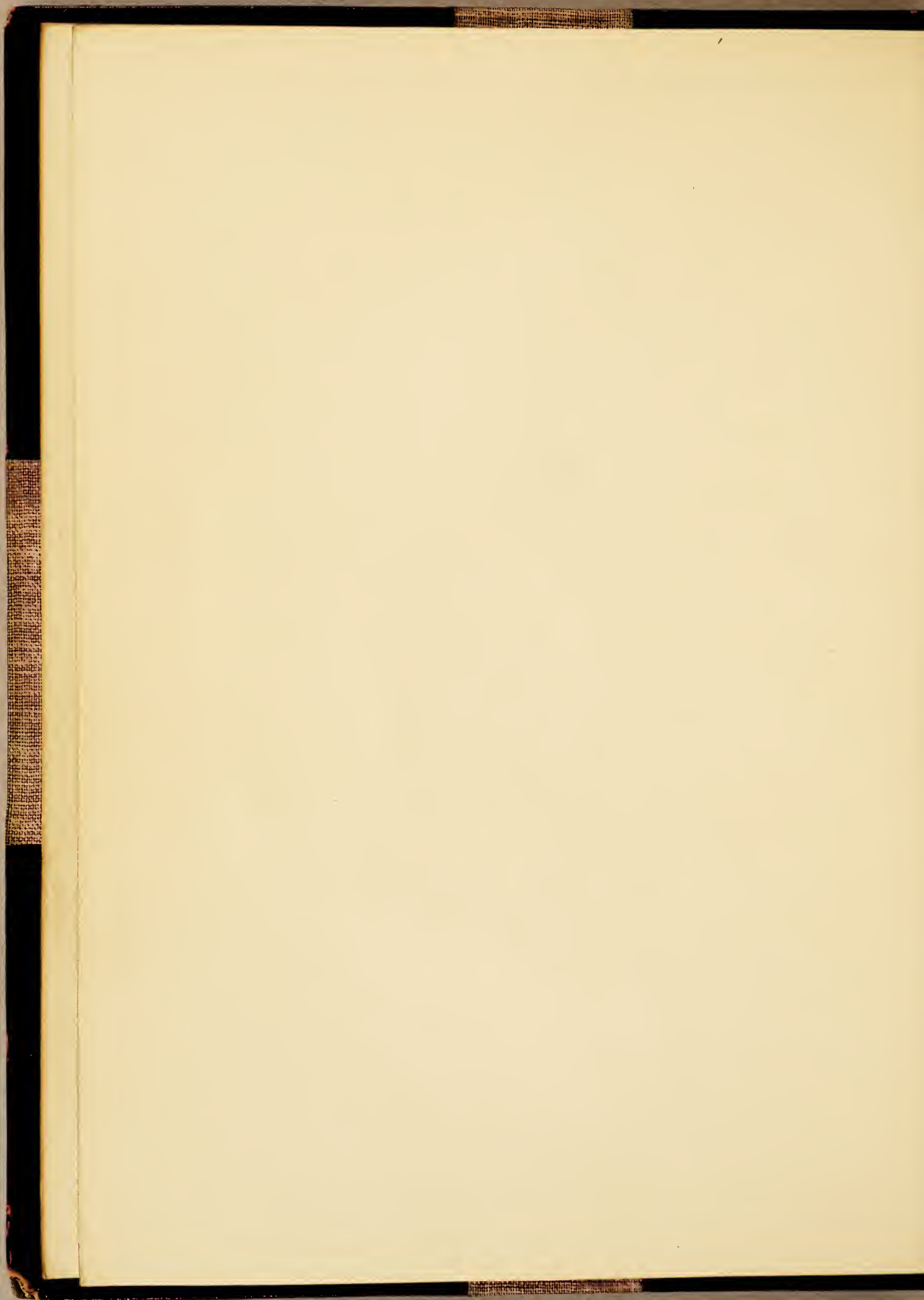


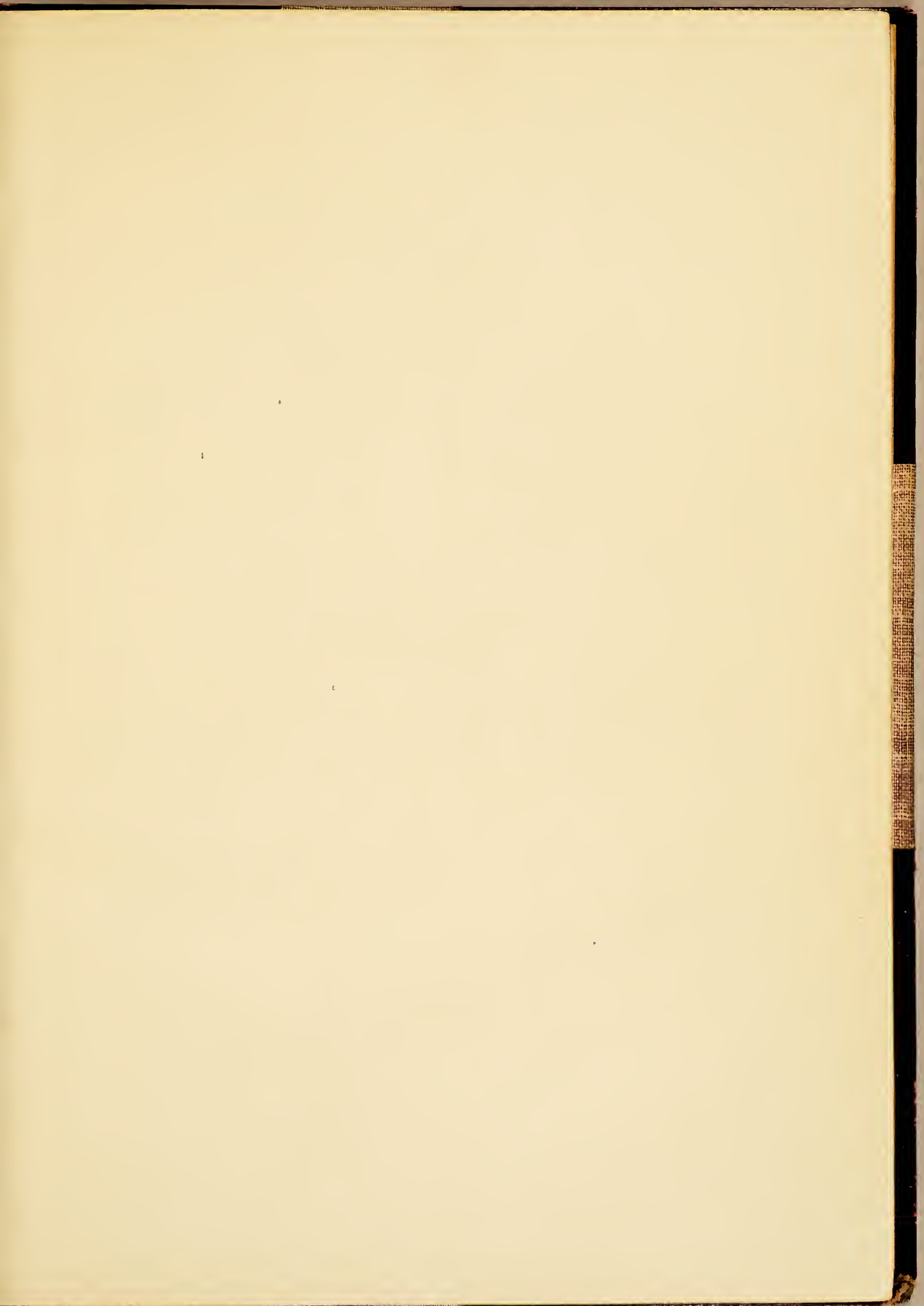
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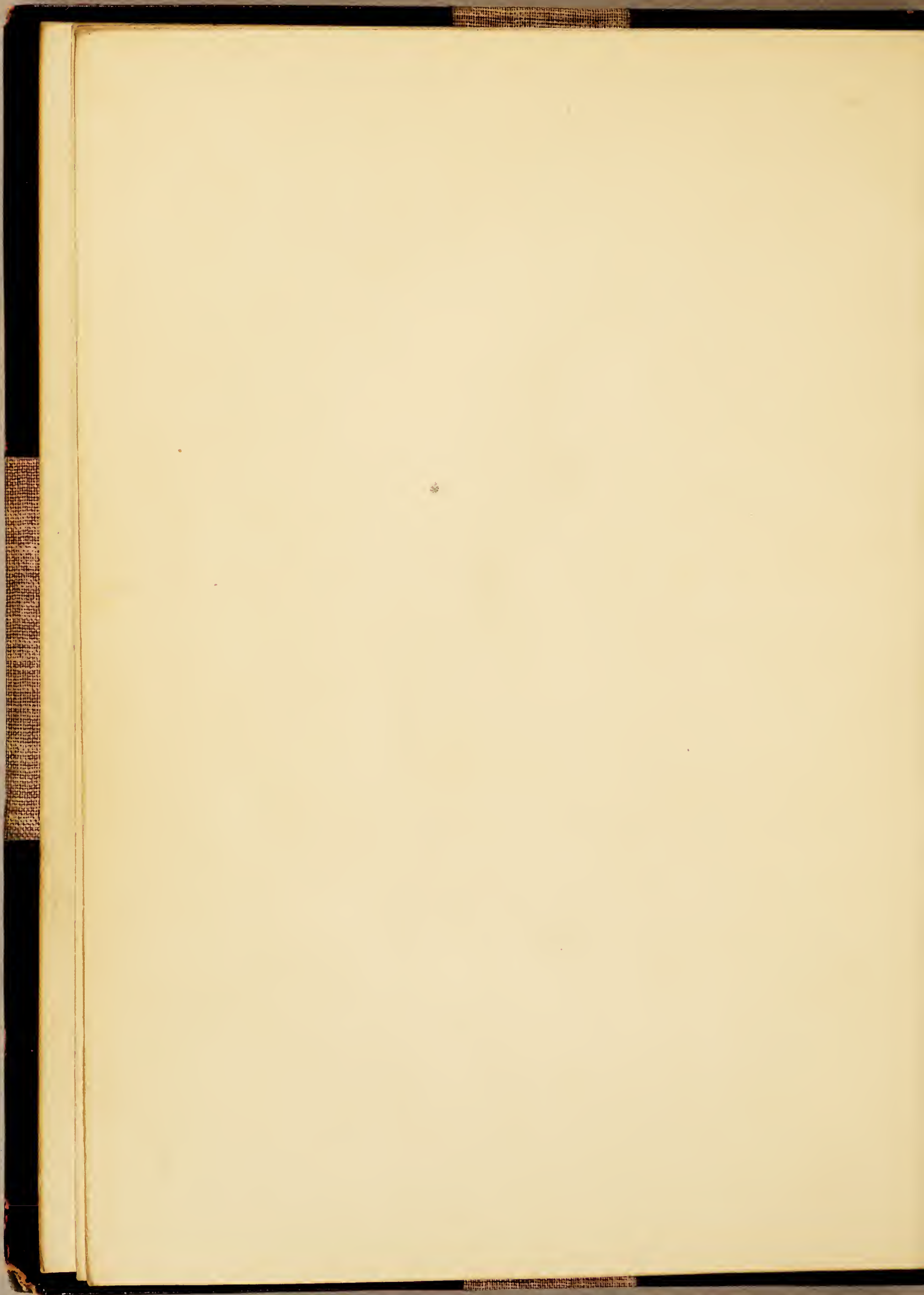
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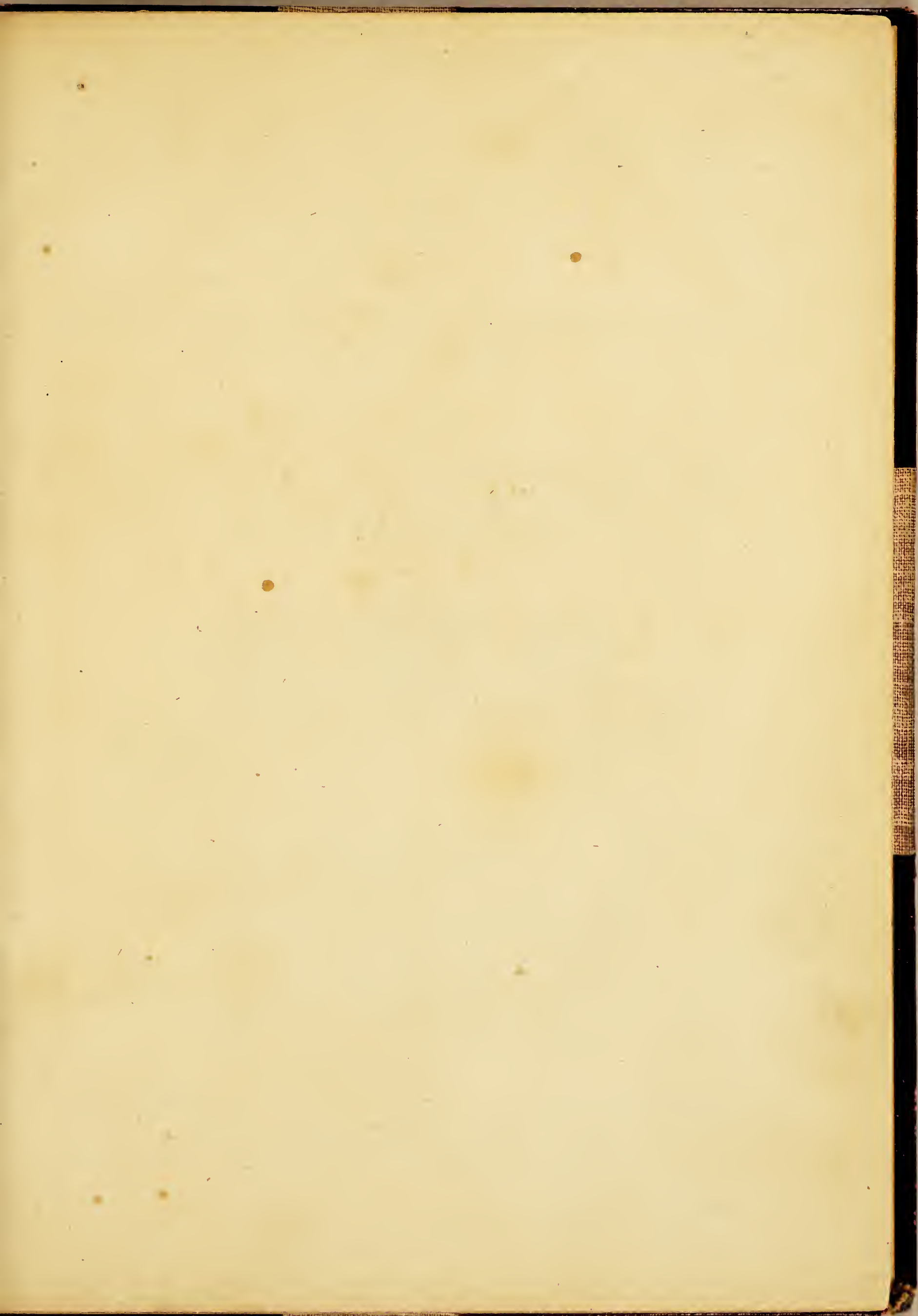
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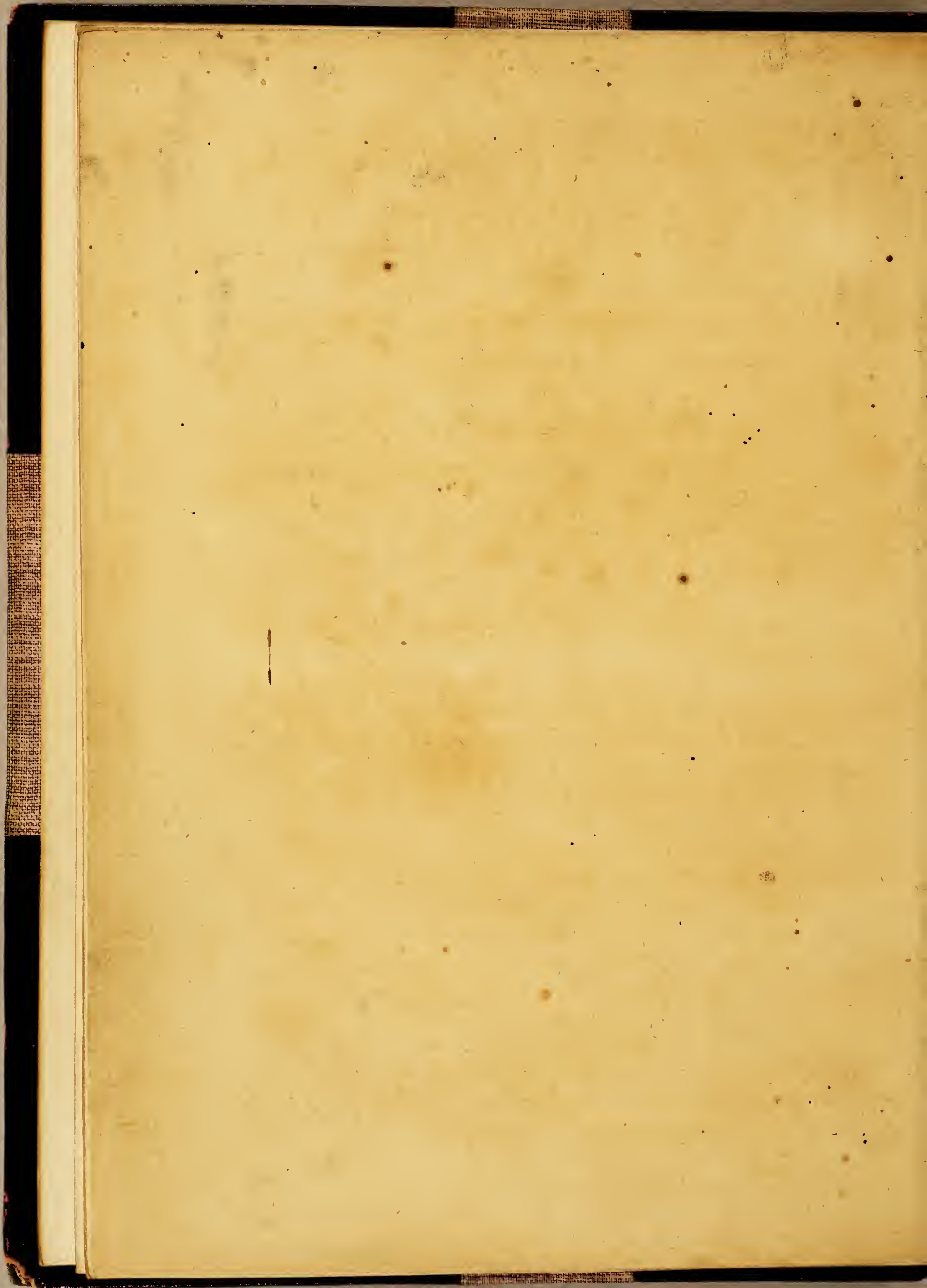












THE
SEAMANS
KALENDER,

Or

An Ephemerides of the Sunne, Moone,
and certaine of the most notable
fixed Starres.

The Eighth Edition.

Newly corrected and enlarged; with an abridged Table
of Sines, and some propositions thereupon, concer-
ning Arithmetical *Navigation.*



LONDON.

Printed by EDVV: ALLDE, for Iohn TAP, and are
to be solde at his shop at Saint Magnus corner.

Anno Domini

1622.

RPJCB



To the right **V**Worshipfull Sir **I O H N**
P A I T O N Knight, Governour of his Majesties Isle
of *Iersey*, I. T. wishes worlds pleasures,
and heauens happines.

THE Bee (*right worshipfull*) by *serious industrie*
gathering a certaine hidden vertue from sundry
sortes of Flowers and Hearbes, and making thereof
(by labour and trauaile) a materiall Lumpe, namely
the Hony-combe: is not therefore to be condem-
ned by any, but rather commended of all. The Physition, of ma-
ny simples making one compound medicine, doth not onely there-
by reape profite to himselfe but applauditie to others, And the
studious Reader, out of many Authors doth select some chiefe
principles which hee recordeth as memorials, either to profite him-
selfe or to pleasure others.

Of these two comparisons, the first is excellent for immitation
in generall, the second very necessarie for diuers in particular, and
the last, (though not so highly esteemed of the common sorte of
people, by reason of their ignorance in Artes and Sciences, yet for
the good that may come thereby to a Common-wealth) nothing
inferiour to the best: especially, where their study tendeth to
good and vertuous exercises, or the practise and contemplation
thereof to laudable Artes and Sciences. Of which Artes, namely
Mathematicall, Nauigation being a principall member, as hauing
participation in *Arithmeticke*, *Geometry*, *Geography*, *Cosmography*,
and *Astronomy*, or rather to say the truth, being the quintessence
of them all, yea the prooffe and tryall of them: for albeit that men
reade or heare neuer so much of *Cosmography* or *Astronomy*, yet
without practise and experience it is vnperfect: and how can per-
fection be attained but by sayling and transporting from place to
place, thereby beholding the diuersities of dayes and nights, with
the temperature of the Ayre in sundry Regions, whereby the
A 2 whole

The Epistle Dedicatorie.

whole course and reuoluion of the Sphere is made apparant to Mans capacitie? and by what meanes can Sayling bee performed but by Nauigation? which so being, it may be affirmed that as the *Mathematicall* Sciences are the grounds of Nauigation, so is Nauigation the onely meanes, whereby the excellencie of those Arts and Sciences, are proued and laide open, to the view of the world. Therefore very aptly may Artes be tearmed the mirrour of Nature, because that by Artes, the wonderfull and hidden secrets of Nature are reuealed: And Nauigation may bee called the tryall of Artes, being that thereby the whole study of Artes is proued to be true. These reasons moouing mee, as also being many times conuersant with Sea-men and Marriners, whereby I perceiued what they (I meane the common and playner sort of them) chiefly desired: at my best leysure I made a collection of such Tables and Rules, as I thought fittest for their purposes: and being instantly vrged by diuers to publish them, although I was very loath to aduenture my simple laboures to the common view of carping censurers: yet at last (hoping well of the best, and not greatly respecting the worst) I resolued to hazard my papers to the Presse, and (as the common custome of the world is) thinking vpon a Patron, to protect it from the malicious flanders of malignant spirits, I presumed vpon your Worships fauour in two respects: the one in consideration that your selfe beeing so well acquainted in the Artes *Mathematicall* would (though not in respect of the Author, yet for affection to the matter) vouchsafe the protection of them: The other, that beeing in duty bound to be at your Worships pleasure, I knowe not how I might shew my selfe dutifully affected, better then by dedicating my (though vnpolisht yet well willing) laboures to your fauourable disposing, beseeching your Worship to accept of them, and to pardon my boldnesse: and so with my dayly prayers to God for your health and prosperous successe in all your actions, I rest:

Your Worships, most dutifully
to bee commanded,
JOHN TAP.



*To the Courteous Readers
health.*

Gentle and indifferent Readers,
whose iudgements are not so Sophistically
mixed with humorous conceites, and quip-
ping quidities, (as many are now a dayes) who
are apter with their turbulent tongues to condemne all
thinges, then with sensible iudgements to amend any
thing: as for them or any such carping Zoylistes, I am
indifferently perswaded to set as lightly by their partiall
and iniudiciall censures, as they are farre from hauing a
good opinion of ought but what is agreeable to their
own fantasticall fictions: Onely to them that are of more
plausibile spirits and grauer iudgements, who (for the
most part in reading) applaude that which is good, and
passe ouer with silence that which is not hurtfull, with-
out scoffing at the worke, or deriding the Author; and
to those that hauing small vnderstanding, are desirous of
more knowledge in the Art of Nauigation, and other
Mathematicall studies: To the one I commit the cen-
suring of my worke, and to the other the profit of my la-
bours: knowing that the wise will rather winke at small
faults, then rashly reprove that which may profit others,
though not pleasure themselues: And though (as I say)

To the Reader.

the curious and expert Mariners finde nothing herein conteyned which may satisfie their expectation, yet I hope they will Iudge fauourably of my intention, and with patience passe it ouer for affection to the Art it selfe, wishing Charitably that my skill were answerable to my will: As for the meaner sorte whose experience haue not beene fitted with Artes rudiments, nor their iudgements fined with demonstratiue illustration in the Mathematicall Sciences, but onely are now (as it were) setting themselues with willing mindes to learne what they before wanted, I make no question but as by these following Tables & Propositions they may reape profit, so accordingly, in yeelding friendly censures vpon mee and my workes, they shall answer my expectation, with a full recompence of my passed labours. And

so I leaue thee friendly Reader, to the practise of what followeth: hoping that
as it may be profitable to all,
so it can no way bee
hurtfull to
any.

Yours to vse:

I. TAP.





¶ Certaine definitions, meete to be vnderstood of
Those that will practise *Navigation*.



Sphere or Globe, is a round figure, made by the turning of halfe a Circle, till it end where it began to be moued; or a massy body inclosed with one platfome or surface: in the middle whereof is a pizicke, from which all lines drawn to the surface, are equall.

Center is the point or pizicke aforesaid, in the middle of a Sphere, Globe, or other Circle.

Diameter is a right line, drawn through the Center, to the Circumference or surface of a Sphere or Circle to each side thereof.

Circumference is a round Circle, equally distant on all sides from the Center thereof.

Surface or Superfices is the vpper part of any thing.

A Degree is the 360. part of the circumference of any Circle.

A Minute is the 60. part of a Degree, being vnderstood of measure: but in time, a minute is the 60. part of an houre, or the fourth part of a Degree, 15. degrees answering to an houre, and 4. minutes to a degree.

The Pole is a point, or a pizicke imagined in the Heauens: whereof are two, the North Pole being the center, to a Circle described by the motion of the North Starre, or the tayle of the little Bears: From which point aforesaid, a line imagined to passe through the center of the Earth, and passing directly to the opposite partes of the Heauens, sheweth the South Pole.

The Equinoctiall is a great Circle imagined in the Heauens: also deuiding the heauens into two equall partes, and lying iust in the middle betwene the two Poles, being in compass from West to East, 360. degrees, euery degree of terrestrial measure, valuing 20. English leagues or 60. miles.

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The Meridian is a great Circle deviding the Equinoctiall at right angles into two equall partes, passing also through both the Poles and the Zenith: to which Circle, the Sunne comming twice every 24. houres, maketh the middle of the day, and the middle of the night.

Note that euery place hath a seuerall Meridian, which doe all meete together in the Poles of the world.

Zenith, is a point or pꝛicke in the Heauens, right ouer our heads, 90. degrees from the Horizon, as the Pole is 90. degrees from the Equinoctiall.

Nadir, is a point or pꝛicke in the heauens vnder our feete, opposite to the Zenith.

Horizon, is a great Circle deviding that part of the Heauens which we see, from the other part we see not.

Azimuth, is a great Circle, crossing the Horizon at right angles as the Meridians doe the Equinoctiall, being as many as the Meridians: and as the Meridians concurre and meete together in the Poles of the world, so doe the Azimuthes meete in the Zenith, which is the Pole of the Horizon.

Paralels, are lines or Circles equally distant in all partes one from another, as all Circles of East and West are Paralel to the Equinoctiall.

Almicanterahs, are Circles paralell to the Horizon, being also Circles of Altitude or eleuation, being that the Altitude of the Sunne, Moone or Starres aboue the Horizon are discribed thereby: which Almicanters doe crosse the Azimuthes, as the Paralels or Circles of East and West doe crosse the Meridians.

The Tropickes, are two lesser Circles paralell to the Equinoctiall, limitting the bounds of the Zodiacke or the greatest declination of the Sunne on each side of the Equinoctiall. The Tropicke of Cancer Northward, and the tropick of Capricorne southward, whose distance from the said Equinoctiall are 23. degrees, and 31. minutes.

The Zodiacke, is a great Circle, crossing the Equinoctiall in two opposite places thereof, and swaruing Byas wise therefrom towards either of the Poles, touching the tropicke of Canc. on the North

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North part, and the tropicke of Capri. on the south part thereof. In the Zodiacke are the 12. Signes: viz. Aries, Tau. Gem. Can. Leo, Vir. Libra, Scor. Sagit. Capri. Aqua. Pisces, every signe being 30. degr. in length, and 12. in breadth: through which lines the Sun passing, describeth a yeare, and the Moone passing likewise thorough the same makes a Moneth; the 12. Degrees that the Zodiacke hath in breadth, is allowed for the latitude of the Planets.

Eclipticke is a Circle lying iust in the middle of the Zodiacke, out of which the Sunne neuer goeth, but the Moone and other Planets are sometime on the one side, and sometime on the other side thereof, in which the head and tayle of the Dragon also is.

The head and tayle of the Dragon, are two opposite points in the Ecliptick line of the Zodiack, which goeth backward through all the 12. signes in 19. yeares: And when it happeneth that the Sunne and Moone are in Coniunction, in that place of the Eclipticke where the head or tayle of the Dragon is, then is the Sunne Eclipsed, and being in the opposition, the Moone being in either of the said points, the Moone shall be Eclipsed.

The Circle Articke is a circle which incloseth all those starres which doe neuer rise or set in any Latitude, but are alwaies about the Horizon where the North Pole is raised: the like is understood of the Circle Antarticke, where the South Pole is raised.

The Polar Circles are two little circles distant from the Poles of the world, so much as is the greatest declination of the Zodiacke from the Equinoctiall: in which Polar Circles are the Poles of the Zodiacke.

Colures are 2. great Circles passing through both the Poles, crossing one another in the said Poles at right angles, and deviding the Equinoctiall and the Zodiacke into foure equall partes, making thereby the foure seasons of the yeare. The one Colure passing through the Equinoctiall pointes of Aries and Libra, sheweth the beginning of the Spring time and Autumne, which two times, the dayes and nights are equall. The other Colure passing through the two tropicall pointes of Cancer and Capricorne, sheweth the beginning of the Summer and Winter: at which two times, the dayes and nights are longest and shortest.

Altitude

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Altitude in the Heavens, is the height of any thing above the Horizon towards the Zenith.

Latitude is the widenesse or distance of the Planets or Stars, from the Eclipticke, either Northward or Southward. Also Latitude is the distance of the Zenith of any place from the Equinoctiall, towards either of the Poles, which is alwayes equall to the height of the Poles of the same place.

Longitude is length, and in the Heavens it is understood the distance of any Starre or Planet, from the beginning of Aries to the place of the said Planet or Starre, or from the beginning of any signs to a certaine other part or degree of the same signe: Otherwise longitude in the earth, is the distance of the meridian of any place, from the Meridian which passeth over the Isles of Azores, where the beginning of longitude is said to bee: Longitude, is counted upon the Equinoctiall, and latitude upon the Meridian.

Declination is the declyning or distance of the Sun, Moone or Starres from the Equinoctiall, and is said to be North or South according to the Pole towards which it leaneth.

Amplitude is the distance of the rising and setting of the Sun, Moone or Starres, from the true East or West point of the Compass upon the Horizon.

Ascension is the rising of any Star, or of any portion of the Eclipticke above the Horizon. Right Assention is the number of degrees and minutes of the Equinoctiall, which commeth to the Meridian with the Sun, Moone, Star, or any portion of the eclipticke. Oblique Ascension is the number of degrees of the Equinoctiall, which riseth or commeth to the Horizon with the Sun, Moone, Star, or any portion of the eclipticke: In which sort is Oblique Descension also. Assentionall difference, is onely the remainer, the one being subtracted or taken from the other.

The Golden number or Prime, is the time of 19. yeares: in which time the Sunne and Moone maketh all varietie of their Coniunctions, Oppositions, and other Aspects.

Epact is the 11. dayes and 6. houres, which are added to the yeare of the Moone, being 354. dayes, to make it equall with the yeare of the Sunne, which consisteth of 365. dayes $\frac{1}{4}$. By the

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the Prime is found out the Epact : and by the Epact is found out the age of the Moone.

The Circle of the Sunne is the number of 28. because that in 28. yeares, all the varietie of Dominicall or Sunday Letters and leape yeares, are expired, being that at the 29. yeare, the said Circle doth begin againe : the vse of the which number is to finde out the Dominicall Letter for any yeare past, present or to come, Where note, that there is but 7. letters which serue for Sunday letters, viz. A B C D E F G, And albeit that in the dayes of the weeke, they proceede according to their naturall order of the Alphabet, yet in the yeares they goe backward : as if G. be for one yeare, F. shall be for the next : and when it is Leape yeare (which is euery fourth yeare) then is there two Letters for the yeare, the first seruing from the first of January till St. Mathias day, which is then the 25. of February, and then the other Letter takes place, and serues till the end of the yeare.

To finde which number of the Sunnes circle, and consequently the Dominicall letter for the yeare proposed, to the yeare of our Lord, adde 9. that totall deuide by 28. and that which remaines is the Circle of the Sunne for that yeare : Then to know the Dominicall letter : note that the 28. yeare the dominicall letter is A. and is the third from the Leape yeare : therefore the first to begin withall againe, is G. because it is another leape yeare, and so counting the 7. letters backward, and euery fourth yeare counting 2. letters, that letter vpon which the number of the Sunnes circle ends, shall be the Sunday letter for the yeare proposed.

As for Example.

The yeare 1618. adding 9. thereto, it makes 1627. that being deuided by 28. the remainer is 3. the circle of the Sunne : then counting 3. of the 7. letters backward till I haue counted 3. places, beginning with G. thus : 1. G. 2. F. 3. E. 4. D. I finde that the 3. place ends vpon D. which I conclude to be the Dominicall letter for the yeare aforesaid : & it is the 2. yeare after the leape yeare.

And here is to be noted, that the Prime and Dominicall Letter, changes the first day of January, and the Epact the first day of March,

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To finde out the prime.

Deuide the years of our Lord by 19. and to that which remaineth after the deuision, adde one: the product is the prime number for all that yeare. As for example.

I would know the Prime for the yeare 1623. deuide 1623. by 19. and you shall haue in the quotient 85. and after the deuision, there rests 8. vnto which if you adde one, it makes 9. which is the Prime for the yeare 1623.

To finde out the Epact.

Adde to the Epact of the yeare past 11. and if it passe 30. take away 30. and the product is the Epact for all that yeare: but otherwise, which is the better way: imagine three places vpon your hand, which for example let it be the 3. ioynts of one of your fingers, and call or name the first ioynt 10. the second 20. the third 30. then count the Prime number vpon the 3. ioynts aforesaid and going ouer them vntill you come to the end of the said Prime number, marke vpon which your Prime ends, and adding the number of the ioynt with the prime, if they come not to 30. that shall be the Epact for all that yeare: if they passe 30. take away 30. and the remainder is the Epact, if it be iust 30. then is the Epact equall to the Prime.

As for Example.

The yeare 1623. the Prime is 9. and imagining the first ioynt of my finger to be 10. the second 20. the third 30. I count vpon the three ioynts 9. the Prime number, viz. vpon the first ioynt I tell 1. on the second 2. on the third 3: againe, on the first 4. the second 5. and so to 9. which is the Prime ending vpon the last ioynt, which I call 30. therefore taking away the number of the last ioynt, leaues nothing but that the Epact is also 9. which is the Epact also for the yeare 1623.

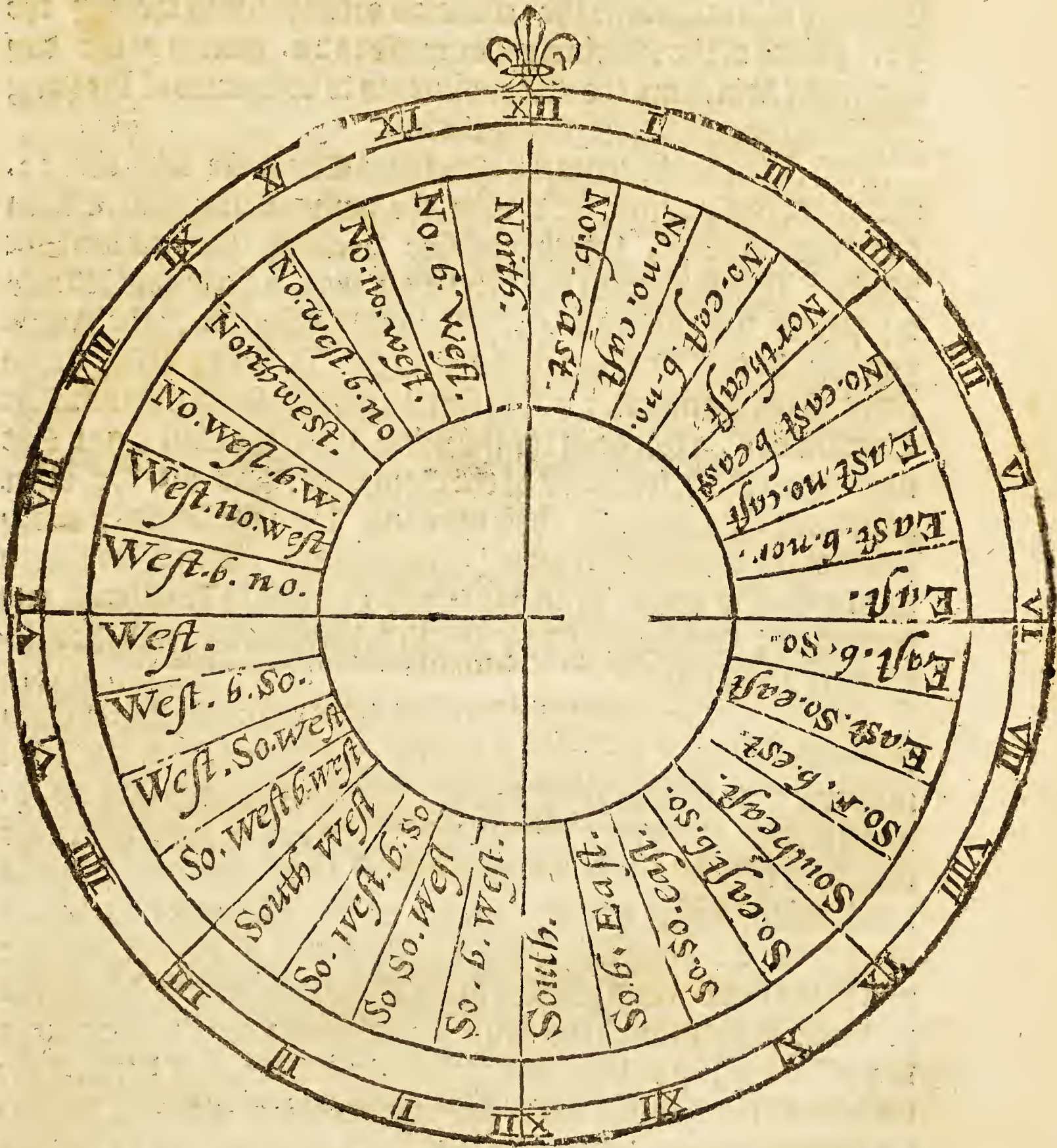
To know the Moones age.

Adde to the day of the moneth, the Epact, and so many dayes more as are moneths, from March to the moneth you are in, including both Moneths, and if they come not to 30. so much is the Moones age: but if they passe 30. take away 30. and the ouerplus is the Moones age.

This

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This is when the month hath 31. dayes, but if the month hath but 30. dayes, you must take away but 29. and the rest is the age aforesaid, for in those monthes that haue 31. dayes, the Coniunction is the 30. day of her age, and in those monthes that haue but 30. dayes, the Coniunction is the 29. day of her age.



A Decla-

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A Declaration of the former Instrument.

This Instrument giues you a plaine and easie order, for the
Mitting of the Sunne and Moone for euery day of her age,
and also it is a ready and most necessarie reckoning of the Tides,
whereby also is sholue the common order to bring thereby the
32. points of the Mariners Compasse to 24. houres of the day
and night, which are the first rudiments to be learned of the yong
scholler or appzentice in Nauigation.

First, heere is the common Mariners Compasse with the 32.
points thereof plainely set downe, the names being printed vpon
each seuerall point, which must bee perfectly learned without
Booke: then is there in the vttermost edge, a circle deuided into
24. partes, which signifie 24. houres of the day and night, where
you may see that twelue a clocke at night is iust vpon the North
point of the Compasse: 12. at none vpon the South point of the
Compasse, 6. a clocke in the morning, vpon the East: and 6. at
night vpon the West point of the Compasse: and for the other
pointes of the Compasse their agreeing with the houres, euery
point of the Compasse makes $\frac{1}{4}$ of an houre as you may see North
and by East is vpon $\frac{1}{4}$ of an houre past 12. North Northeast, one
houre and $\frac{1}{2}$ Northeast and by North 2. houres and $\frac{1}{4}$ and so conse-
quently of the rest.

Also to the Center of the Compasse is fixed a moueable circle to
turne round about the said Compasse: the vttermost edge wherof
mouing close within the Circle of houres, is deuided into 29. e-
quall partes, signifying the dayes of the Moones age, which are
numbred in Arithmetical figures, from the first day of her age to
her Coniunction or meeting againe with the Sunne: at which
place of her Coniunction, is left a little Index or shewer to direct
you to the houres and pointes of the Compasse: which Index also
shewes you how much the Sunne and Moone are a sunder ouery
day of her age, by telling the pointes of the Compasse betwixt the
number of the Moones age in the said moueable circle and the In-
dex thereof, accounting euery point for 11. degrees, and $\frac{1}{4}$ or other-
wise

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wise the number of houres contained in the vttermost Circle, betwixt the said number of the Moones age and the Index: accounting euery houre for 15. degrees, shewes the degrees of distance betwixt the Sunne and the Moone.

Now to keepe a reckoning of the tides thereby, you must know by the Table hereafter set for that purpose, how it flowes: that is to say, what Moone makes full Sea or high water at that place where you would know the time of the tide or high water for the day proposed: which knowne, you must also by the former propositions, or else by the Kalender following, know the Moones age: then seeking out the number of the Moones age in the moueable Circle, place the said number of the Moones age vpon that point of the Compasse which makes full Sea vpon the change day at your place desired, and staying it there, the index which is in the said moueable Circle, points you directly to the point of the Compasse that the Sun must be vpon, when it shall be high water the foresaid day in the desired place, and also in the vttermost fixed Circle it shewes the houre of the day which you desire.

An Example.

The first of January 1623. I desire all this aforesaid: First for the Moones age, because that the Epact changes not till the 1. of March, I adde the Epact of the last years before which is 28. and the day of the month 1. is 29. then January being the eleuenth month from March, 11. added thereto makes 40. from which subtract 30. leaues 10. for the Moones age the 1. of January, 1623.

Againe, to know how much the Sunne and Moone are asunder, the Moone being 7. dayes olde, I seeke in the moueable Circle for the Moones age, which being 7. I place 7. vpon a certaine point of the Compasse, which for example is here West, and the Index shewes the North and by west, and $\frac{3}{4}$ to the Northward, which is 7. points and $\frac{1}{4}$ that multiplied by a 11. $\frac{1}{4}$ the number of degrees that belong to a point of the Compasse, makes 87. deg. 12. minut. for the distance betwixt the Sunne & the Moone, and in houres it shewes 5. $\frac{1}{2}$ which multiplied by 15. yeelds the like, being very neere $\frac{1}{4}$ of the Zodiacke.

Then for the tides, at London Bridge it flowes Southwest
and

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and Northeast, or is high water at 3. a clocke on the change day: there fore when the Moone is 7. dayes olde, I place 7. the Moones age, vpon the point Southwest 3. a clocke, & staying in the moueable rundle there, I see that the Index shewes almost Northwest, which is 40. minuts nearest hand, or neere 3. quarters of an houre past 8. of the clocke, at which time it shall be high water at London bridge, the Moone being 7. dayes olde.

Againe, at Harwich where it flowes South and by East, the Moone 10. dayes olde, I lay 10. (the Moones age) vpon the point of the compasse South and by East, and then the Index shewes the point West Northwest of the Compasse, and in the Circle of houres, of an houre past 7. which is the time of the full Sea, at Harwich, the Moone being 10 dayes olde.

But if you want a Table or instrument to worke the account of the tides, you may doe it by memory, multiplying the Moones age by 4. and deuide the product by 5. and to the quotient adde for euery vnitie which remaines vpon your deuision 12. mi. that totall adde to the houre that it makes full sea on vpon the change day, the product shall be your desired number, as in the first example.

The Moone 7. dayes olde, and the high water at London on the change day, at 3. of the clocke. I multiply 7. (the Moones age) by 4. makes 28. that deuided by 5. the quotient is 5. and 3. remaines vpon the deuision, which 3. being so many times 12. min. makes 36. min. and added to 5. in the quotient, makes 5. houres 36. min. that added to 3. the houre of full Sea vpon the change day, makes 8 of the clocke and 36. minutes as aforesaid.

The gouernment of the Planets.

Diuers writers haue disagree'd, concerning the Planitary houres, some making the houres of the Planets equall with the houres of the clockes, and so continuing their Regiment orderly with the othev common houres. Some againe, beginning the said Planitary houres at none, some at midnight, and some againe at the Sun rising: which indeed for the time of the beginning of the account is the best, and for the difference of the equalitie and inequality betwene the planitarie houres, and the common houres of the clockes, Gemma Frisius agreeing with the best

Astrono

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Astronomers saith, that as the dayes and nights doe increase or decrease, so must the Planetary houres be longer or shorter accordingly, neuertheless so that there shall be 24. planetary houres in the day and night, as well as of other houres, but that if the day consist of more then 12. houres, then proportionally the planetary houres to consist of more then 60. minutes: and if the day be lesse then 12. houres, then the planetary houres to be lesse then 60. minutes: and if the day be iust 12. houres, then the planetary houres are equall to the houres of the clockes and not otherwise. The like is to be vnderstood of the nights: and to make an equalitie of the planetary houres to them of the clockes, being that how long soeuer the day is, yet there must be but 12. planetary houres: and how short soeuer the day is, there must (neuer the lesse) be 12. planetary houres, and so of the night: by which you see that the planetary houres, are sometimes greater and sometimes lesser then the common houres of the clockes, which alwayes consist iust of 60. minutes, therefore if you deuide the day into 12. equall parts, one of those partes shall be the quantity of a planetary houre, which you may doe thus: multiply the houres of the day into minutes by 60. and if there be any odde minutes, adde them to the product, the totall being deuided by 12. the quotient shewes the number of minutes contained in an vnequall or planetary houre.

And againe, if at any houre of the day or night you know not what planetary houre it is, that is to say, how many planets haue ruled since the beginning of the day or night proposed: multiply the number of the houres past from Sunne rising by 60. and deuide the product by the number of the minutes contained in an vnequall or planetary houre, the quotient will shew you how many houres and minutes of the Planets are past from the Sunne rising (if it be in the day) or from Sun setting if it be in the night: which knowne, enter the Table following to know what Planet rules the day and houre proposed, looking for the houre desired in that coloume which is right vnder the day proposed: those Planets which are gouernours of the said houres in the day time, being placed on that side next the left hand, and the gouernours of the night on the right hand.

B

Example

The Sea-mans Kalender.

Example.

The 17. day of May being Sunday at 9. of the clocke in the morning, I would know what Planet rules? First in the following Kalender, I finde that the 17. of May the day is 16. houres long, therefore I multiply 16. houres by 60. minutes, and the product is 960. that deuided by 12. brings in y^e quotient 80. minutes for the length of a Planetary houre at

Gouernours of the night	Sunday,	Munday,	Tuesday,	Wednesday,	Thursday,	Friday,	Saturday,	Gouernours of the night
Sol	1	12	9	0	10	0	11	Iupi.
Venus	2	0	10	0	11	1	12	Mars
Mercurie	3	0	11	1	12	2	0	Sol
Luna	4	1	12	2	0	3	0	Ven.
Saturne	5	2	0	3	0	4	1	Mer.
Iupiter	6	3	0	4	1	5	2	Lun.
Mars	7	4	1	5	2	6	3	Satu.
Sol	8	5	2	6	3	7	4	Iupi.
Venus	9	6	3	7	4	8	5	Mars
Mercurie	10	7	4	8	5	9	6	Sol
Luna	11	8	5	9	6	10	7	Ven.
Saturne	12	9	6	10	7	11	8	Mer.
Iupiter	0	10	7	11	8	12	9	Lun.
Mars	0	11	8	12	9	0	10	Satu.

that time: then from 4. of the clocke (the time of the Sunnes rising) till 9. a clocke, the houre proposed is 5. houres, which multiplied by 60. brings 300. that deuided by 80. (the length of a Planetary houre) brings in the quotient 3. houres and 3. quarters: so I conclude, that at 9. of the clocke, 3. Planets haue past their Regiment, and the 4. hath ruled 3. quarters of his houre: therefore vnder the title Sunday in the top of the Table, I looke for 4. toward the foote of the said table, against which on the left hand is placed Luna, therefore I say that the 17. of May being Sunday, at 9. of the clocke in the morning, Luna shall haue reigned 3. quarters of her houre.

A Rut-

The Sea-mans Kalender.



A Rutter, for the Courses round about Ireland, from Cape to Cape, and what tides it makes in euery Harbor, and how many leagues it is from Harbor to Harbor.

Ipprimis, from Cape-cleare to the Mison-head, is 7. leagues, and lyeth west and by North, and East and by South, you shall finde a Hauen north west from Cape-cleare, called Crooke Hauen, and it floweth there East northeast, and west southwest, you must goe west to enter into it.

From the Mison to the Durzib, is 7. leagues, and lyeth West northwest, and east southeast.

Bearc Hauen lyeth from the Mison-head, north northwest 3. leagues and a halfe, you must goe northwest into the Hauen, it floweth east northeast and west southwest: if you will anchor betweene the Durzib and the maine Land, you must goe aborde the Island, for the east side is not sound.

The 3 Islands that be of the point of the Dowrzies, which is called the Bull, the Cow and the Calfe, they be sound, you may goe within them or else betweene them, for there is no danger but what you see.

Dowrzies, and Blaskey lye North and by west, and south and by east, and there is betwixt them 12. leagues, the Skellocks is betweene both, and it floweth northeast and southwest.

Northeast of the great Skellocks a 2. leagues off, you shall finde the entry of Vallens, you must runne east southeast to enter in, it floweth east northeast, you must borrow of the Island to enter

The Sea-mans Kalender.

In, for the point of the easter side is long.

North northeast of the great Scellocks, 6. leagues off, you shall finde the Hauen of the Ventry which is a good Road: It floweth east northeast.

N. E. by N. of the great Scellocks, 7. leagues, you shall finde the hauen of Dingell, and without the hauen is a rocke called the Croo, which is found on both sides: the rocke doth not cover but on a spring tide: you must run north west and by west into the hauen, it floweth east northeast and west southwest.

The Ventry and the sound of Begue lyeth south by east, and north by west 3. leagues, and when you are past into the sound of Begue, you must lye east and by north into the roade against a red cliff which is on the south side.

Southeast of the sound of Blaskey, a 6. leagues off, you shall finde a good harbor named Begue, which is to the northeast of Valence: The said Hauen hath two entrees, but the west side is the best: You must take great heed of a sunke rocke that is on the Islands side, which you must lean on your Larboard side going in, and it floweth East northeast and west southwest.

You shall understand, that the said sound of Blaskey lyeth southeast and north west, but you must take heed of a sholde that is on the east side athwart the Sezebras.

From Blaskey to Smerrick is 3 leagues, and if you enter into the hauen, you must goe southwest into it: It floweth east northeast and west southwest.

There is a hill to the eastward of Smerrick, which is called Sin-brandon, goe from Smerrick east northeast, and you shall goe with Lopus head, which maketh entry of the riuer of Lymeric, on the north side: there is from one to the other 10. leagues.

Smerrick and the head of the Kerry, lye east northeast and west southwest, 7. leagues a sunder, and there is within the Bay three Islands called Salline.

From Lawpshead to the Seatries is 7. lea. they lie E. N. E. and W. S. W. and if you enter into the riuer, take heed of a sholde halfe way betwene Lawpshead and an Island called Starrick, which
you

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you must leave on the South side, and to the Eastward of that Island, is a good roade: it floweth east northeast, and west south west.

From Scattricke to Quoine is five Leagues, you must goe East, and you shall finde two Islands, they be flat Islands, goe you to the northwards hard aboard them, and from thence runne East northeast, and you shall finde a Rocke called the Bieffe, goe hard aboard the South side of the said Rocke called the Bieffe. And when you are at the said Rocke, you must rowe South east, and you shall finde another Rocke called the small Bieffe, then goe with the Island of the entrie of Dorsey, and borrow aboard the Islands, as nere as you can, for feare of the Banke going into the Haven, and you must moore at the Castle by foure Cables, for there goeth a great tide, it floweth east northeast and west southwest.

The sound of Blaskey, and the Islands of Arrin, lyeth North northeast, and south southwest, and there is betwene them 16. leagues: the Islands lye east and west, and makes the entrance of Galloway and of the other Islands: there is one which is naught, but the west sound is good, and the next sound to it is good, which is called the little sound, but the sound comming from the East is naught, but the next comming to the Black-shore from the east is partly good, but you must put the two particions to the Island, for it is dangerous: You must understand that there is one Island in the course way, betwixt Lampshed and the entrie of Galloway, that hath a great Ranie, a league and a halfe of the maineland.

If you goe befoze the towne of Galloway, goe aboard the Black-shore, and bying the Black-shore Southeast of you: then goe northeast, and you shall fetch an Island called Motton Island, and there is betwene them both thre leagues: you must not trust to the north shore, for there is a shoole halfe way to the Black-shore, and the Island of Motton is thwart of two white points, which is on the north side.

The said shoole is upon the west southwest side of the said Island of Motton a league and a halfe off at a spring tide, then shall you

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for it dyle, and it floweth at the said Iland, East northeast and west southwest.

The sound of Saint Gregory and the Rode of Galue lyeth East northeast and west southwest, and there is betwixt them 8. leagues.

The sound of S. Gregory and Siluishead, lye Southeast and northwest and the distance betwixt them is 9. leagues.

Slinshed and Sarke lye north by west, and are distant 15. leagues.

Black-rock is an Iland which is west of a Kill-head, a league of the Cape: the said Black-rock and the Staggs lyeth northeast and by North, and are distant 12 leagues.

From the saide Black-rock, runne North and you shall finde the Iland of East Eues, and there is betwene them 2. leagues.

South southwest of the Staggs there is a Hauen called Broadhauen, from the Hauen to the Stagge is 2. leagues: the Staggs is a Cape that maketh the entrie of the Riuer of Raffin, they lye East and west, and are distant 8. leagues: the Staggs and the Cape of Tellen lye northeast & Southwest and are distant 15 leagues.

Betwixt the Staggs and the Cape of Tellen in the Bay is the Hauen of Moy, the Hauen of Portway, the Hauen of Slego, the Hauen of Ballechennen, the Hauen of Dongall, the Hauen of Kellekeg, and the Hauen of Tellen.

The Cape of Tellen, and the Iland of Arron, lye North northeast, and south Southwest, and are distant 7. leagues.

The Iland of Raghlenborne, and Tellen, lye southwest and northeast and are distant 2. leagues.

The Iland of Raghlenborne, and the Iland of Torre, lye North northeast and South southwest, and are distant 14. leagues.

To the Eastward of Torre, is a Cape called Horne-head, and are distant 2 leagues: southeast of Horne-head is a Hauen called Sheep-hauen it floweth East and west, but you shall haue in the Bay a good roade for all Windes: the said Hauen is a broad Hauen, and is two leagues from the Cape.

Horne-

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Horne-head and the entry of Loughfoyle, lye East northeast, and west south west, and are distant 6. leagues.

The entrie of Loughfoyle, and the Island of Enerster-houlde, lyeth Northeast and Southwest, and are distant five leagues.

The Island of Torre, and the Island of Enerster-houlde lyeth East and by North, and West and by South, and are distant 9. leagues.

The entrie of Loughfoyle, and Enersterhoulde, lye Southeast and northwest, and are distant 5. leagues.

The Isles of Enersterhoulde, and Skirris Portrush, lye East southeast and West northwest, and are distant 10. leagues.

You must vnderstand that the Riuer of Loughfoyle lyeth from Skerris Portrush, West southwest, and East northeast, and there is betwixt them, the Riuer of the Band: there is betweene Portrush and Loughfoyle, 5. leagues: There is in the entrie of Loughfoyle, a Sand which is called the Tonnes, which is dangerous for any Ship of charge: also there is a Channell of the East side of the Tonnes, hard aboard the shore, but you must haue your tide: It floweth East by South, and West by North: Skerris Portrush and it, lyeth south and north, and are distant 12. leagues.

Skerris Portrush, and the Islands of the Raghlin, lye Northeast and by east, and Southwest by west, and are distant five leagues, it floweth in Skerris East southeast, and west northwest, the flood commeth from the Eastward.

Off the Raghlin is a Cape called the faire Forland, and betwixt them is a league and a halfe, the faire Forland and the Knee lyeth South southeast, and North northwest, and are distant 9. leagues.

The faire Forland and Loughrian in Scotland, lye East southeast, and West northwest, and are distant 15. leagues.

There is betwixt the Knee and Carickuergus 5. leagues.

The point of Loughrian, and the Islands of Commoras off Scotland lye North and South, you must passe by Elliso, and by the Haven of Lambach a sunder 7. leagues.

The Sea-mans Kalender.

The point of Laughrian and Copnam Isles, lyeth Northeast, and southwest.

The Knee and the Rocks of the Maydens, lye northeast by north.

The Knee and Elke in Scotland, lye Northeast by east, distant 10 leagues.

Loughrian in Scotland, and the moule of Galuc, lyeth south southeast, and north northwest, and are distant 7. leagues.

the Mould of Galuc, and the Calke of Man, lye South southeast, and North northwest, and are distant 10 leagues.

The Compman Isles, and the roade Carricke Vergus lye East and west, and are distant 14. leagues, it floweth in the sound east southeast, and west Northwest.

Compman Isles and the point of the Moulens, lye south southeast, and north northwest, and are distant 7. leagues.

The point of the Moulens and the Ile of Lambay, lye south southwest, and north northeast, and are distant 21. leagues.

Lambay and Carlingford, lye north northwest, and south southeast, and are distant 18. leagues.

Lambay and the Ile of Dalke, lye south southwest, and north northeast, and are distant 5. leagues.

The banke of Wiclo beginneth thwart of the Forth of Dublin and continues to the Ile of Tosker, they lye North by west, and south by east, and they lye in length 24. leagues.

Tosker and the point of the Grenord, lye East and by north, and west and by south, distant 2. leagues.

And when you are bound to the eastward of the Grenord, you must keepe the Mountaine of Washford aboue the lowe land, and so you shall goe cleare of all the dangers betwixt you and the Shore: and if you close the Bount with the lowe land, then you shall goe with the dangers.

Tosker and the Cape of Canwall, lye south by east, and north by west 40. leagues.

Tosker and the Salts, lye East northeast, and west southwest, distant 6. leagues.

The Salts and Silly, lye South and North, and are distant thirty

The Sea-mans Kalender.

thirty three leagues.

The Salts and the Tower of Waterford, lye East and west, distant 5. leagues.

The Tower of Waterford and the Ile of Ballecutin, lye south west and by west, and north east by east, but betwene the Tower of Waterford and Ballecutin, is a Haven called Yoghall, and a Sea-board it, is an Island called Capell Ile, and betwene Capell Island and Ballecutin is 4. leagues.

The Tower of Waterford and Heluick-head, lye East and west, distant 3. leagues.

Capell Island and the Island of Ballecutin, lye west south west, and east north east, and are distant 3. and a halfe leagues.

Ballecutin and Corke Haven lye West by South, and east by north, and are distant 3. and a halfe leagues.

Oyster Haven and the Old-head of Kinsale, lye south west and north east, distant 3. and a halfe leagues.

The Haven of Kinsale lye from the Old-head north north east, and going in, you must keepe Bane Castle open of the west land.

The Old-head and Cape Cleare, lye west by south, and east by north, and are distant 14. leagues.

Cape Cleare and Silly, lye east southeast, and west north west, distant 50. leagues.

There lye from Fasten a Haven called Crocke haven, and is from it north west, distant 4. leagues.

There is a Haven called Scoll haven, which lye from Fasten north and by west, distant 5. leagues.

There is a head-land, halfe way betwixt the Old-head of Kinsale and Beltemore, which is called Kendonetedo, and it lye north west by west, from it is a good Haven called Clendor, there is a high Land to the Eastward, you must goe aboard that high land, and so into the Haven. There is a ranie of Rockes on the west land, that goeth to the eastwards, therefore keepe the east side, and when you come in, Anker before the Castle: there lye west north west from the said head, a good Haven, called Castle-haven, 4. leagues from it, and if you come out into the Sea,

and

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and meeete with the Staggs, you must goe northeast into Castle-hauen, and in the entrie there is an Island which you must leaue on the East side of you, and another flat Island which you must leaue on the west side of you, you may goe dry at lowe water from it to the maine, for it is very nigh to the West land, but be bolde on the easter Island, and goe right with a Chappell that lyeth on the East side of the maine Land, and when you are thwart of the Chappell, you shall see a Castle of the west side, and thwart of the Castle you may enter in 12. fatham, it is from the Staggs 3. and a halfe leagues.

You must vnderstand that the flood shootes from Dorze to the Old-head of Kinsale north northeast, and the ebbe to the contrary, and from the Old-head to the Tower of Waterford, northeast and southwest, and from the Dourze to the northwards, north northeast and south southwest.

If you will goe in betwixt the Cash and the North-head of the grounds into Dalky, you must bring a round hill that standes like a Sugar loafe north northwest, and then you shall haue 10. fatham: It floweth southeast alongst the Channel and the barre of Poulbacke, there is eight fote water vpon it at lowe water, and 3. fatham at full Sea: your Barre lyeth South and North, and you shall haue in the roads of Poulback, 14. fote at lowe water.

To sayle from Dalky to the roads of Poulback, you must keepe a small Rocke open, a hand spicke length, and when you come to the Barre, you must lye west southwest vp into the roade within the Beacon, then must you Ancker in 4. fatham at high water, for there be two Hilles on the South side, a high hill and a lowe round hill, bring them both in one, and then you bee in the best of the Rocke. A south southeast Monne, makes a full Sea.

A Note



A Note for going into
Dublin.

If you come for Milford, you must leave all the Ilands to the Westwards, and when you have the Grasham Point north west, then the Haven beareth northeast by north, & when you come into Dall Rode, you may ride in 3. fatham and a halfe at low water, it floweth East by North.

Milford goeth in close under Cowein and Scabon, to the Eastward, and when you come open of Milford, you shall see an Iland like the Mawstone, which lyeth on the East side, and in Dall rode you may ride for all windes, the Small lyeth from the Grasham 3. leagues, and betwixt them lyeth a ledge of Rockes, which is dry at lowe water, it lyeth midway, it is very dangerous coming betwene them.

A Gene.

The Sea-mans Kalender.

A Generall and Compendious tide-Table,
 shewing what Moone makes full Sea or
 high water, in all these places
 following.

Full Sea on the Coastes of *Zurphen, Friezland,*
Holland, Zealand, and
Norway.

A t the Iutlandish Isles be- foze the Riuers of He- uer, Fyder, and Elue.	S. and N.	land, Wyering, and Amster- dam.	S. W
A t Anhuifen.	S. and N.	W ithout the bankes of Flaun- ders.	S. W.
T he Ile of Vrck befoze Delfe- Ile, at Emden, and all the Chozes of Flanders.	S. and N	D odrecht and Ziericke Sea.	S. W
B efoze the Maers deepe.	E. and W	R otterdam, and from Harlem to the Riuer of Maes.	S. W
A t Hambrow and Antwerp.	E. and W	A t Ward-house	E. and W
U nderneath Holyland.	W. S W	A t Brihac.	E. S E
A t Egmount and Harlem.	W. S W	C ape Gallant.	S. by E
I n the Bresond and Vourd.	W S. W	T he Hauens of Yotland and Norway.	S. and N
B efoze the Easterne and we- stern entrances of the Emes, or riuer of Emden, befoze all the Coast of Friezland and the Flye.	S. E	A t Corpus Christi point.	S. S. W
B efoze the Ghest of Texell.	E. S. E	B efoze the Fen in the Channell, at Horn, Edam, Ile of Gore, befoze the Maes befoze Can- fer and Teruer.	S. S. W
U pon the flats of west Friez-		B efoze the Willing and all the Coast of Zealand.	S. S. W
		N orth Cape and Blangbrow.	S. W
		F ox nose, and S aint Nicholas roade.	W, S, W Full

The Sea-mans Kalender,

Full Sea on the Coast of France, Spayne, and Portugall.	head,	S.w
	Before the River of Naunts & before the Bay.	S.w
	In the Bay within Vshant.	
A t Blacknesse, Armuy, Rammekins, and Camfer.		w.s.w
	At the Sept. Iles, and at Calice in the Creeke,	w.s.w
Within the Fosse of Caen.	Within the river of Roan, and from the Polehead of Burde- aux, to the Forland of Foun- tains, before Brouage, in the river within all the hauens aforesaid, it floweth	s.w.b.w
Calice road and Diepe.	At S. Iohn de Luze,	s.s.E
At Boleine, Calice, Grauelin, and Dunkerck, halfe tide.	At Concalo, and Saint Malo.	E and w
The Island of Basse,	At Cape Saint Maries,	E.b.E
Within the Seine, before the Calquets, before Gamesey.	On al the coast of Biskay, Ga- lizia, Portugall, and Spayne, it floweth south-west and northeast.	
Before Cherborough and the Rase of Blanquet.		
At Newport halfe tide,		
At Seine head,		
At Gamesey, and before Saint Poul,		
Bellisle and Holly Ile,		
Without Vshant, and before Burdeaux,		
Brittaine, Penmarke, Poytou, and Gascoine.		
Rase of Fountnes.		
Bloy, and S. Mathews,		
Abrowrath, and S. Malowes,		
Before the Killiats,		
Portwise, and before the River of Burdeaux.		
From the Rase to the Pole-		

Scotland.

At S. Magnes found,	s.E.b.E
At Faire Iles	s.E
In the Frith,	s.s.E
Faire Ile Rodes,	s.b.E
At Orkney,	s.E

England.

A t Barwick it flows	s.s.w
At the Staples halfe tide.	N.E.b.E
At Howncliffe foote, halfe tide,	N.E.b.E
At Flam-	

The Sea-mans Kalender.

At Flambrow-head one quarter tide.	E.N.E	Between Bridlington and Lawrenas,	W.s.w
At the Shoo,	S. and N	Between Lawrenas and Cromer along the Well,	halfe tide,
At Timmouth one quarter tide	S.W		E. and W
At the Sporne,	W.b.S	Between Cromer and Yarmouth roade,	S.E
Newcastle & Humber,	W.b.S	Between Laistow roade and Orfordnes,	S.E.b.s
Winterton,	E.S.E	Between Orford and Orwell waues,	S.s.E
Blacke tayle and the Nowre,	S.b.W	Between the Naze and the Ware-head of Colne,	S.b.E
Blackney & the Shields,	E. & W	At the west end of the Nere,	S.b.W
Yarmouth,	S.E.b.E	Rochester and Maldon,	S.b.w
Orford and Albrow,	S.E.b.S	At Grauesend,	S.s.w
Whitbay and Robin-hoods bay,	S.W	London and the middlest of the Heads or Straights,	S.w
Before Hartlepoole,	S.W	At the north Forlands,	S.s.E
Scarbrov one quarter tide,	W.S.W	At Beachy,	S.and N
Hull and Lin halfe tide,	E. & W	Seauen Cliffes,	S.E
Before Humbers mouth,	N.w	In the Downes,	S.s.E
At Burnham one quarter tide,	E. and W	In the Camber and at Gore-end,	S.b.E
Cromer,	S E	At Cambernes and at the Needles,	S.E.b.s
At Liestow quart. tide,	S.S.E	In Cambernes roade,	S.s.E
Harwich and Douer,	S.s.E	Portsmouth, Hampton and the Ile of Wight,	S. and N
Harwich within,	S.b.E	In the Offing from the north Forland to the south Forland,	it runneth halfe tide,
South Forland,	S.s.E		and from the south Forland to the Nasse,
Before Margate and Thames mouth,	S.b.E		it runneth halfe tide, and halfe quarter tide,
Ligh and Kentish knock,	S. & N		and
Spits and along the Swine,	S. and N		
Between Timmouth & Flambro-head,	S.W		
Between Flambro-head and Bridlington-bay,	S.w.b.w		

The Sea-mans Kalender.

and from the Nasse to Fairly
one halfe tide and from Fair-
ly to Beachy one quarter
tide vnder other.

At Portland rode, E.S.E

At S. Ellens, S.E.b.E

Within the Race of Portland,
at Poole in the Hauen, at
Home-head, and thwact of
Plimouth and Dartmouth.

S.E

At Waymouth E. and W

At Famouth, Foy, Fourne, Pli-
mouth & Dartmouth. W.b.s.

Bristow and Foulnes, E.b.s

At the Start, E.b.s

Moshole. W.s.W

S. Davids head, E. and w

Milford-hauen, E.S.E

Ile of Man and Catnes, S.E

Three leagues off the shore, at
the Lizard to the shore, and
to the Lands-end, E.S.E

Within Torbay and in the bay
of Carnaruen, W.b.s

At the mouth of Seuerne,
W.b.s

At the Mooales, W.b.s

From the Lizard to the Sor-
lings, W.b.s

Before Silly in the Channell,
E. and w

At Silly halfe tide, S.s.w

Within Mounts Bay, and in
the Sea of Wales and Se-
uerne, W.s.w

At Lundy and the Holmes of
Bristow, E. and w

In the Sleene betwæne Silly
and Vshant, S. and N

Note that the Floud sets in at
the East end of Wight till a
Southeast Hoone : in the
roade of Dungenesse South
Southeast, but without in
the Channell a Southwest
Hoone full Sea : from the
Seames, and in the broad
sound betwæne it and V-
shant, the Floud runneth
East northeast, and West
southwest.

Ireland.

At Caldy, W. by S

Waterford and Abermo-
rick E. and W

At Cape-cleare, E.S.E

Macknels Castle, S.E.b.E

Dublin and Lambay, S.E.b.E

Dunbar and Kildien, S.E

Dungaruin, Kinsale, Corke

Hauen and Baltemore,

W.S.W

The Sea-mans Kalender.

The Course of all the Coastes of Holland,
Zealand, France, and Spaine, vpon what
Point, and in what distance
they are.

From the Ile of Texell vnto Egmont,	S. & by w. leagues 50
From Egmont vnto the Maze,	S.s.w.l. 11
From the Maze vnto the Wieling,	S.w.l. 12
From the Wieling vnto the head of Straight betwæne Douer and Callice.	w.s.w.l. 18
From the Ile of walkeren or Flushing vnto Calice,	s.w. & by w.l. 22
From Blacknesse vnto Deepe,	s.s.w.l. 12
From Deepe vnto Seyne-head, or the Riuer of Seyne,	w.s.w.l. 11
From the Seyne-head to the Riuer of Cane,	s.w.l. 8
From thence vnto Cape de la Haugue,	N.w.l. 12
From thence vnto the Caskets,	w. & by N.l. 8
From the Caskets to Garnesey,	s.w. & by w.l. 4
From Garnesey to St. Malo,	s.s.E.l. 10
From Garnesey to the Sept Iles,	s.w. & by s.l. 12
From the seauen Iles to St. Poul.	w.s.w.l. 8
From thence to the Fourne,	w.s.w.l. 10
From the Caskets to the Fourne,	s.w. & by w.l. 34
From the Fourne to St. Mathewes point,	s.s.E.l. 3
From thence to Fontenau or Fonteynes,	s. & by E.l. 5
From Vchant to the Seams, Seaboard it,	s.l. 7
From Fontenau to the west Penmarques,	s.E.l. 7
From thence vnto the Ile of Croy,	E. & by s.l. 12
From the west Penmarques, to Bell Ile,	E.s.E.l. 15
From thence to Heys some what more Easterly,	s.E.l. 12
From thence againe vntill within Piquilier,	E & s.l. 10
From thence againe vnto Croyhill,	E. & by s.l. 9
From Piquilier vnto Heys,	s. & by w.l. 5
From Heys to the Kiliats,	E.s.E.l. 10
From the Ile of Heys to Porthuis,	s.E. & by E.l. 12
	from

The Sea-mans Kalender.

From St. Martins Island to the burning Ile,	S.E. & by E. 1. 3
From the Burning Ile to the Oyster banks,	S.s.E. 1. 3
From St. Martins Ile to the Tower of Cordam,	S. & by E. 1. 12
From thence unto Bayone,	S. & N. 1. 28
From Bayone to Orio,	W.s.w. 1. 5
From Orio unto St. Ion de Luz,	E.s.E. 1. 6
From Orio unto St. Andrew,	W. & by s. 1. 20
From St. Andrew to Cape de Pennas,	E. & w. 1. 30
From Cape de Pennas to Ribadeo,	S.w. & by w. 1. 12
From Cape de Pennas to Ortegall,	W. & by w. 1. 20
From Ortegall unto Ribadeo,	E. 1. 14
From Ortegall unto the Ile of Cizaega,	S.w. & by w. 1. 13
From Cizaega unto Coronna,	E.s.E. 1. 6
From thence unto Cape de Coriana,	W.s.w. 1. 10
From Coriana to Cape Finisterre,	S. & N. 1. 3
From Finisterra unto Bayone,	S.E. & by s. 1. 14
From Bayone unto Port de port,	S.s.E. 1. 18
From Port de port to Aueiro,	S. & N. 1. 8
From Aueiro to Montega,	S.s.w. 1. 5
From Montega unto Barlings,	S.w. 1. 12
From Barlings unto Roxende,	S. & by E. 1. 12
From Roxende to St. Vues point,	S.E. & by s. 1. 8
From thence unto Cape St. Vincent,	S. & N. 1. 24
From thence unto Pharo,	E. & w. 1. 14
From Pharo unto Lepe,	N.E. & by E. 1. 12
From Pharo to Saltees,	E.N.E. 1. 18
From Saltees to Chipiona,	S.E. 1. 8
From Chipiona to Calis malis,	S.E. 1. 6
From Calis unto the straight of Gibraltar,	S.E. 1. 8
From Calis unto Cape de Cantin,	S.w. by s. 1. 60
From Cape de Cantin to the Ile of Madera,	W. 1. 104
From Cape St. Vincent to Madera,	S.w. & by w. 1. 115
From Roxende to Madera,	S.w. 1. 130
From Roxende to the Ile of Tercera,	W. 1. 210

The Sea-mans Kalendex.

The Courses of England, Ireland,
and Scotland.

From Boecknes vnto Leeth in Scotland,	S.S.w.leagues 28
From Leeth vnto Barwicke,	S.s.E.L8
From Barwicke vnto the Holy Ile,	E.s.E.l.4
From S. Abbes head to the Easterne end of Farne Isles,	S.E.l.6
From the Isles of Farne to the Tees mouth,	S.s.E.l.16
From the Riuer of Tees to Flambrow-head,	S.E.& by E.l.14
From Flambrow-head to Blackney,	S.E.l.18
From Blackney vnto Winterton,	S.E.l.8
From Winterton vnto Lestoff,	S.& b.E.l.8
From Lestoff vnto Orford Hauen,	S.l.7
From Orford vnto the Foreland,	S.s.E.l.13
From the Foreland to Douer,	S.l.5
From Douer to the Shingles, or the Nesse point,	S.w.& b.w.l.7
From the Nesse point vnto the Beache,	w.s.w.l.6
From the Beache to the Ile of Wight,	w.& b.s.l.15
From Wight vnto Portland,	w.& b.s.l.10
From Portland to the Start point,	w.s.w.l.14
From the Start vnto Ramhead point,	w.N.w.l.6
From Ramhead vnto Dodmans point,	w.s.w.l.8
From Dodmans to the Lizard point,	S.w.& b.w.l.6
From the Lizard to the Isles of Silly,	W.l.12
From the Lizard to the Lands-end,	w.N.w.l.8
From the Lands-end to the Ile of Lundy,	N.E.l.14
From thence vnto the Holmes of Bristow,	N.E.& b.E.l.16
From thence vnto the Ile of Caldie,	w.s.w.l.25
From thence to the Isles of Salteys, on the Coast of Ireland,	W.N.w.l.20
From Salteys to Cape-Cleere,	w.s.w.l.25
From Cape-Cleere to the Ile of Dorsey,	W.l.12
From the point of Dorse to the Ile Blakem,	N.N.w.l.16
From Blakem vnto the Isles of Arran,	N.N.E.l.14
From the Isles of Arran to Galwicke or the Galfe in Ireland,	E.N.E.l.6

Of

The Sea-mans Kalender.

Of diuers and sundry Courses ouer the
Westerne Sea.

From the Texell on the Coast of Holland to Flamborough,	W.N.w.leagues 49
From Texell vnto VVinterton in Norfolke,	west, l. 32
From the Ile of Texell vnto Lestoffe,	w. & b.s.l. 28
From the Riuer of the Maze, in South Holland vnto Harwich,	west, l. 26.
From the said Maze to the Foreland of England,	w. & b.s.l. 25
From the Marsdeepe in North Holland, to the said Foreland,	Southwest, l. 36
From the said Marsdeepe to Calico,	w. & b.s.l. 38
From Douer vnto Bulloigne,	S.E.l. 8
From Bolloigne vnto the Beache,	w.l. 16
From the Beache to Deepe in Normandy,	S.E.l. 18
From Deepe vnto the Ile of VVight,	E.s.E.l. 28
From Wight to the Seyne head or mouth,	S.E.l. 20
From the said Riuer of Seyne to Portland,	w.N.w.l. 30
From the Ile of Wight vnto the Caskets,	S.w. & b.s.l. 14
From Garnesey vnto S.Malo in Normandy,	S.s.E.l. 8
From the Caskets to Portland,	N. & b.w.l. 10
From the Caskets to the Start point,	w.N.w.l. 16
From the Start to the Sept Iles in Normandy,	S.s.E.l. 24
From the Start to St.Poul in Normandy,	S & b.w.l. 22
From St.Poul to Portland,	N.E. & b.N.l. 32
From the Fourues to Ramhead,	N.N.E.l. 28
From the Start point vnto Vshant,	S.w. & b.s.l. 32
From the Fournie to the Lizard,	S. & N.l. 22
From Vshant to the Iles of Silly,	N.N.w.l. 26
From the Sorlings to Milford Hauen,	N. & b.E.l. 25
From the Sorlings to Wexford in Ireland,	N.N.w.l. 34
From the Sorlings to Cape-Cleare,	N.w.l. 42
From Cape-Cleare to Cape de Finisterre,	S. & N.l. 130
From the Lizard to Cape de Finisterre in Galicia,	S.s.w.l. 112

The Sea-mans Kalender.

From Vshant unto the Ile of Cizarga in Galizia,	S.s.w.l. 85
From Vshant to Laredo in Biscay,	S.s.E.l. 85
From the Seame Rockes to St. Sebastian in Biscay,	Southeast and by s.l. 10
From Vshant againe to Cape de Pannas in Biscay,	S. & N.l. 70
From Bel Ile unto Ortegall in Galizia,	S.w.l. 75
From St. Martins Ile to Ortegall,	W.s.w.l. 85
From Ortegall to Cape de Coriana,	S.w. & by w.l. 24
From Cape de Finisterre to the Iles of St. Michael,	W.s.w.l. 185
From St. Michael to the Ile of Tercera,	N.w.l. 26
From Cape de Finisterre to the Iles of Madera,	Southwest and by w.l. 190
From Madera unto the great Ile of Canary,	S.E. by E.l. 60
From Cape de Finisterre to Bayone in Galicia,	S.E. b. E.l. 15
From Cape de Finisterre to the Ile of Barlings,	S. & N.l. 50
From the Barlings in Portugall to the Ile Canary,	S.s.w.l. 170
From the Iles of Madera to Calis malis,	E.N.E.l. 150
From Calis to Cape de Cantin,	S.w. & by s.l. 65
From Cape de S. Vincent unto Cape de Cantin,	S. & N.l. 62
From Cape de Vincent unto the Iles of Madera,	Southwest and by w.l. 120
From Roxen in Portugall to the Ile of Tercera,	E. & w.l. 210

The Courses of Norway, Swedeland, and East Finland.

From Schuytenes to the Vesteen,	S. & by E.l. 4
From Vesteen or Wollone to the Iedder,	S.s.E.l. 4
From the Iedder to the Vorsteen or Forstone,	S.E.l. 5
From the Forstone to the Noes,	E.s.E.l. 6
From the Noes unto Reperwicke,	E.N.E.l. 8
From Reperwicke to Mardon,	N.E.l. 10
From Mardon unto Iofferland,	N.E.l. 8
From Iofferland to Langhesondt,	N.N.E.l. 1
From Langhesondt to Ferderoer	N.E. & by E.l. 6
	From

The Sea-mans Kalender.

From Ferderoer vnto Soen water,	N.1.6
From Ferderoer vnto Roeghe,	N.N.E.1.4
From Ferderoer vnto Akerfond,	E.N.E.1.6
From Akerfond to Maesterland,	S.E.& b.E.1.4
From Pater noster to Nydrinke,	S.E.1.8
From Nydrinke to Waerberghe,	S.E.& by E.1.4
From Waerberghe to Swedoroer,	S.s.E.1.6
From Swedoroer vnto Col,	S.s.w.1.3
From Col vnto Lapsand,	S.E.1.3
From Lapsand vnto Ween,	S.s.E.1.2
From Ween to Drakeriffe,	S.& by E.1.7
From Drakeriffe to Steden,	S.& b.w.1.4
From Steden vnto the North end of Bornholme,	E.& by N.1.5
From Bornholme vnto Anno,	N.& by w.1.8
From Anno vnto the Rockes,	N.E.1.8
From the Rockes vntill within the Calmerfond,	N.N.E.1.10
From Calmerfond to the Sweedish Ionckfrow,	N.N.E.1.8
From Ionckfrow to Landfoort,	N.N.E.1.8
From thence vntill befoze Duryhauen,	N.E.& by E.1.8
From the Stockhoms Schares to View of Abo,	N.E.& b.N.1.24
From View vnto Luns Vtschares,	E.N.E.1.28
From the Vtschares to the Ale Putfuagto,	E.& b.N.1.30
From thence vnto Somere,	E.& w.1.9
From Somere to the Red-hole of Wiburgh,	N.E.1.9
From the Red-hole to Traelsand,	N.E.& by N.1.2
From thence vnto Wiburgh.	leagues, 3

The Sea-mans Kalender.

*The Depths and Soundings, neere
diuers Prouinces. And first of
Gascoigne, Poictou, and
Brittaine.*

VWithout the Riuer of Burdeaux, there is 14. fatham depth, but when you come within the sight of Cordam Tower, 30. fatham.

Ouer against the Coast of Poictou, 16. leagues, without Oleron you haue 35. fatham, but conning neare the land 8. leagues from the shore, you haue 35. fatham: In the Channell betwene Porthuis and Heys, it is 30. fatham, and as much in the Channell of Heys: as also betwene Heys and Belile, without the Channell is 35. fatham, but within 25. without Heys, two kennings off, there is found 45. fatham.

Twenty two leagues Southward of Belile, is 70. fatham, but 9. leagues from the Northwest point of that Island, towards the Southwest is 60. fatham: and ouer against the midst of Belile, in 40. fatham depth you shall see Land. In your course betwene Belile and the Seames, you may come no nearer then 50. or 45. fatham, if you sayle from Belile West and by north: when you are against Gloyland, you shall finde 60. fatham depth, without and within the Rocke which stands off Gloyland to the Seawards, you haue 40. fatham water, in 60. fatham depth without the west Penmarkes, you may sayle Northwest by west without the Seames, but by night come no nearer then in 55. fatham, for the ground is grosse and red sand full of red flintes: halfe a league West southwest off the Seames, is a ledge of Rocks, where you haue 7. fatham depth, but betwene the Seames and the rocks is 50. fatham.

In the Channell betwene the Seames and Vshant, is 55. fatham depth, the ground is grosse and red sand, with little round stones red and blacke: nere to Vshant is 45. fatham, but within it is of a variable depth: Southwest almost 6. leagues of Vshant, you

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you haue 70.fatham, and the ground is fine white sand, with little white shelles, and other small things like needles, and then is Vshant East from you, but if the sand be grosse and white, mingled with great and white shels, then it is Southeast to you, but if you doubt of these grounds, goe Northwardly, if your sound be deepe, then are you towards the Seames, but if not so deepe, then are you in the Channell almost North of Vshant.

Betweene Vshant and Obueracke in the trade it is 60. fatham depth: betweene Vshant and the Sorlings in the middelt of the Channell there is 70.fatham: betweene the Seames and Vshant in 70.fatham water, the ground is of little blacke stones easie to be broken and of yellow earth and Clay, but if you finde red and hard sand, goe Northward till you happen on white sand mingled with long stroakes, and then you are in the Channell.

If from Cizarga you sayle North northeast, in the Spanish Seas towards Vshant, and finde your selfe in 80.fatham, you are 14. or 15. leagues off Vshant, but coming nearer, you shall haue 70.fatham water, and be 10. leagues from Vshant, but if you find the ground to be yellow shelles and little blacke stones, then are you toward the Seames, therefore you must with the tide beare off Northward to thun Vshant, untill you finde white sand, and things like needles, for such are the grounds of the Channell.

Betweene Vshant and the Ile of Base, when you sayle at 4. fatham water, you are 4. leagues off the shore, but by night come no neerer then 25. fatham: when you are two leagues off Obueracke, you shall finde 25. fatham depth, but 8. leagues off the Sept Ilands, you haue 55. fatham.

A league without the Rocks of Obueracke, there is a blinde or hidden Rocke, so that if you are to sayle vpon aboard betweene the Fournes and Obueracke, come no neare the blinde rocke then 40. fatham, but Eastward you may sayle in 30. or 25. fatham.

If a Ship sayling W. S. W. and Southwest by W. of Silly, at 80.fatham water, be found to be vnder 49. degrees 15. minuts of Altitude, shee is 26. leagues from land, and must goe East and by North till shee get 66. fatham water, for then shee is in the Channell betweene Silly and Vshant, and then if shee be bound for
C 4 England,

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England, the must sayle more Southward, and between the Lands end and the Lizard the shall haue 55. fatham depth.

The Soundings and grounds betweene *Ireland,*
England, and *Normandy.*

Three Leagues without the Isles of Dorsey neare Ireland, it is 45. fatham deepe, in the Channell betweene Dorsey and Cape-cleare is 42. or 43. fatham, the Channell from Cape-cleare to Saltees hath 45. fatham, but two Leagues off Ireland it hath but forty: betweene Saltees and Milford it is forty foure fatham deepe, and betweene Lundy and Silly 38. fatham: In the mid-way betweene Silly and Milford is 44. but South of Silly 40. and 42. and neare England by the Lands end, the Channell is of 50. fatham deepe.

Comming from Cape Finister sayling N. N. E. if you haue 80. fatham, you are 20. leagues of the shoare, and the ground is small blacke stones with great redde sand: In the same course, when you haue but 60. fatham, you are within 12. or 14. leagues off the shoare, but shall not so soone ken Land as you thinke for: you shall a great while haue 60. fatham: being at the N. partes of the Channell about Silly: betweene Vshant and Silly, the channell is 70. fatham: on the S. side of Silly, the ground is small red stones, and fine white sand:ouer against the Lizard and Falmouth 4. leagues from shoare, is 52. fatham, betwixt Foy and Plymouth sound, in the Channell highest is 60. fatham betweene the Lizard and the Start, beare no nearer the shoare then 35. fatham, you may cast Ancker in the trade or Channell in 25. fatham and so shall you lye within the Foreland streame: betweene Plymouth and the Sept-Iles. in the middelt of the channell is 55. fatham, but 4. leagues S. S. W. off Plymouth is but 35. fatham, S. S. E. of the midland of the Start is 45. fatham, but from thence 5. or 6. leagues S. E. is 54. fatham, in the Channell betweene the Caskets and Portland is 40. fatham, and a league N. of the Ile of Aldernay is a hole or pit 80. fatham deepe, all the rest of the channell betweene Portland and Aldernay, is of equall depth viz. 40. fatham:

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fathom: when you are within kenning of Portland, your sounding is 34. fathom, and 2. leagues off Wight 36. fathom: also 2. leagues Eastward of Beachy, betwene Picardy and Wight the channell in the middes is 38. fathom, betwene Winchelley and Picardy 24. fathom, the sholde betwene the heads called the Vrowenland, hath but 3. fathom and a halfe, but on the South side of it, is 24. fathom: and in all the faire way betwene Zealand and Douer, it is 24. fathom deepe.

Depths of the North Sea from the *Foreland.*

In the Channell from England, Foreland, and sands of Flaunders, you haue 24. fathom deepe: but 3. leagues *N.W.* by west, of the Countrey of Zierrickze called Botbrecke, it hath but foure fathom depth: without the holde, the Channell of Zealand is 26. fathom: *N.W.* of Harlem, 8. or 9. miles within the Sea, there beginneth a shelle called De breed Verthien, reaching alongst the Coast of Holland to the plaine of Ameland, where it endeth: ouer against Harlem and Egmount, is 13. 14. or 15. fathom, and the ground is full of Dase, mingled with blacke sand like mustard seede: the said shelle hath 15. 16. or 17. fathom depth: betwene Texell and Vlyeland, where the ground is grosse red sand, 6. or 7. leagues from the shoare, for there the holde is narrower then it is towards the South end of the Channell: without the hold betwene Zealand and Texell is 26. fathom deepe, as farre as the holde which the Fishers call Dog-sand. In the channell on Englands side, ouer against Yarmouth is 35. fathom, but against Flamborough and Scarborough point 38. fathom, whereas the white shelle called Dog-sand beginneth, reaching into the North Seas to the channell of Helichland: this holde (where it is within kenning of Flamborough point) hath but 9. or 10. fathom, but when in the same sand you finde 12. fathom, then Texell is from you southeast, almost 30. leagues, but when you are come to 16. fath. then are you within 21. leag. south southeast of Vlyeland.

A Ship that comes from the Riffe, finding 18. fathom depth

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on the aforesaid sand, is then 20. leagues South and by East of Vlyeland, but at 22. fatham, must then sayle towards the Vlye south and by west, and south southwest: but if in the Channell of Helichland, 24. or 26. fatham be found, then must you sayle south west and southwest by south, and then you come to the Schellingh, but if in Helichland sound you haue 27. fatham, then are you altogether to the eastward of it: betwene the Riffe and the Doggerland, the Channell is 26. fatham: without the channell westward it is 32. fatham deepe.

A Ship that comes out of the English Straights, or out of Zealand, hauing at the Riffe 24. fatham, is from the Naes in Norway 18. leagues North and by East, but hauing 20. fatham, is but 16. leagues from it North: and finding but 18. fatham, is then 18. leagues off it North by West: The course from thence to the Holmes, is 12. leagues North by East: from thence to the point of Scakghens 18. leagues Northeast by East, there is a Roocke of one fatham depth, Northeast, and Northeast by East of the Holmes, two leagues from shoare.

Depthes neere Iutland and Ameland.

In the Sea without Iutland, a mile from Dodenberg, is a banke called Reepe-horne, stretching out 8. leagues West by South in some places but threë fatham deepe, and in some places may be sayled ouer, and become a Roade for a Northwest and a north winds in 20. fatham: from Ameland towards the Sea, the ground is grosse sand, red and blacke, mingled with shelles: thence Southwards in 16. fath. sayling 3. houres, you shall come to the smooth Sea of Ameland, where the ground is fine sand, with shelles: North from Schellingh in 24. fatham, is fine white sand, and in 8. fatham white and blacke sand mingled. Vlyeland hath white sand with shelles, and thin blacke sand in 16. fatham depth: from the West end of Vlyeland is great and red sand mingled with blacke like unto Mustard seed: about sixe or seauen leagues from shoare, at the East end of Schellingh to Seawards, at 18. fatham is fine white sand mingled with blacke, hauing

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in it thinges like needles.ouer against Borcke in the westerne Ems at 17. or 18. fatham depth, land may be scene: the ground is grosse grauelly sand: at 14. fatham may Ameland be kend, but Schellingh at 16. and Vlyeland at 15. or 16. fatham water. At the South Hooke of Texell, land may be scene at 16. fatham. Holland at 14. or 15. when you sayle within the shoald called the Breduertien, which beginneth Southwest of Harlem, and stretcheth alongst the Coast of Holland, to the west end of Vlyeland, it is 7. or 8. leagues from the shoze.

Soundings and grounds neare the *Schaw.*

A Great league West by north from the Schaw, is 35. fatham depth: Southnortheast a great league off the corner of this point is 38. fatham, and when the point is northeast from you, then you haue 17. fatham. Betwene this point and Leson, the Channell is 20. fatham deepe, and the ground like Clay or dirt: betwixt Anhout and Waersbergh, in the midst of the Channell is 22. fatham water: betwene Leson and Anhout, the ground is fine and stony: neare Waersbergh is a shoald of 17. fatham depth: betwene Anhout and Coll is another shoald of 17. fatham, whers sometime it is troublesome like a whirle poole.

Depths of the Easterne Seas.

Betwene Oeland and Gothland, the soundings are vnequall, sometimes of 20. sometimes of 23. fatham, the ground grosse and blacke stony sand like Pease: when the South end of Oeland is 2. leagues from you westwards, you haue 27. fatham, where also you may gage water: but when the Chappell of Sudernorden beareth West Southwest off you, then haue you 31. fatham, and ground fit to gage water: ouer against the Rocke in the faire way is 52. fatham, and a clay ground, but fit for gaging: betwene the greater and lesser Carta is 14. fatham, vnder which is safe roade for Ships, there is a shoald betwene Houberg and
Ostergard

The Seamans Kalender.

Ostergard 24. fatham depth, the ground great red sand, but hardly from thence can you ken Gothland out of the top: there is also to the Eastward another sholde of 36. fatham, which when you are past, you haue more then 40. fatham water: when the point of Righ is 3. leagues Southeast from you, then haue you 30. fatham: but when it is from you halfe a league South southeast, you haue but 15. fatham, the ground is white sand: but when it beareth west a small league from you, then you shall kinde 16. fatham: ouer against Heel halfe a league from the shore it is almost 3. fatham deepe: the rode for ships at Heel hath 25. fatham depth: betwene Moan and Falsterborne is 14. fatham depth, betwene Stead and Falsterborne, in the very Channell is but 12. fatham deepe, neare Falsterborne it is full of sholdes, but neare Stead you haue 13. fatham water: betwene Darkeriffe and Southolmen, which is more sholdy, there is 5. fatham wanting two foot: from thence toward the sound it is sometime deeper, 6. 7. 8. 9. 10. fatham.

A note of certaine and most dangerous places
in the Sea.

The principall and most perilous of all, is the Maelstrea-
well or Slorpe, called the Mouskstreame: which lyeth on the
backside of Norway in 68. degrees on the North side of an Island
or Rocke called Weeray. This well draweth the water vnto it
selve during the whole floud (which is the space of 6. houres and
12. minutes) with such an indraught and force, and with such a
noyse through the tumbling and falling of the waues and streams
one vpon the other, that it is rather to wonder at then to write
of, So that during that time, within the space of more then two
leagues round about that Rocke of Mouske (vnder which that
water floweth) no ship or other vessell may come neare, for they
should to their vtter destruction be drawne into it and swallowe
ed vp: but all the time of the Ebbe the water is so strongly cast
vp againe, that no kinde of substance or Mettall, how heavy soe-
uer it bee, can there sinke. So that our Northzen Fishers at that
time

The Sea-mans Kalender.

time doe with their Tollen or fishing Boates, take many and strange formed fishes, which they drawe into their Boates with Hookes and lines, which they haue ready layde for that purpose: for that during the Ebbe, they cannot returne into the Gulph nor get vnder the water by any meanes.

The Northerne people that inhabite about those Rockes, doe thinke that that streame passeth alway vnderneath a part of Norway, vnder the North bottome in East Finland: because that in that place there is likewise such a maelstreame (though not altogether so strong nor dangerous) where the like fishes are taken: and the water is in like sort troublesome, as it is vnderneath, and about the Roche of Mouske.

Whereupon, many experimented Pilots, doe call the said Slorp the Pauell of the Sea, which causeth the courses of the Ebbs and Floods about all the Lands that are on this North side of the Equinoctiall, as the most conuenient place for that purpose, to spread the waters South, North, East, and West: that is to say, Northwardly towards the Pole Arctike, South-easterly on the backside of Russia and Tartarie, towards the Straight of the great South Sea called Mar del Sur, wherein the Spirits Ilands (called the Molluccas, neare the Equinoctiall) are lying southward the North Sea of these Lowe Countries: As also on the backside of Scotland and Ireland, towards the Spanish and Atlanticke Seas, and towards the Northwest beyond Izeland, towards Frobushers Straights, where it is thought the way vnto Catay may be found.

There are mozeouer to be feared vpon the Westerne Seas, very dangerous streames and Gulphes, as in the Race of Portland, where oftentimes hapneth such turning and tumbling of waues and streames, that the Ships which passe that way, are many times in great perill.

Mozeouer, the Rad of Blanquert, betwene Normandy and the Isles of Alderney, roareth and rageth so dangerously, that many Ships fall therein headlong, so deepe, that sodainly they are swallowed vp and suncke to the very bottome.

The Race of Fountney is moze dangerous then all these, where
in

The Sea-mans Kalender.

in many small vessels and Barks of Britanny and of other Countreies, are sodainly deuoured and cast away: and the entrance of the Garrone, called the Riuer of Burdeaux, betwene the Towers of Cordam, and the Southerne and Northerne Asses, is likewise very perillous, and many Ships doe often perish there, if the Pilots be not skilfull and well acquainted with the place.

And these aforesaid being the most full of danger, it behoueth each Pilot or Master to haue especiall knowledge thereof, and great care to prevent the danger that may ensue vnto them thereby.

The yeares for which the Tables of the Sunnes place and Declination following serues.

First.	Second.	Third.	Leape yeare.
1621	1622	1623	1624
1625	1626	1627	1628
1629	1630	1631	1632
1633	1634	1635	1636
1637	1638	1639	1640
1641	1642	1643	1644

Here-

Hereafter followeth a most excellent, necessarie and compendious Kalender, shewing the Prime, Epact, Dominicall Letter, Leape yeares, and moueable Feasts, for 24. yeares, Includiuey comprehending therewith the true day and houre of the Moones Coniunction or Change, for 19. yeares to come, with the true place of the Sun, and his Declination from the Equinoctiall, both Northwards, and Southwards vpon euery degree thereof, through the 12. Monthes of the Yeare.

Year of our Lord	Prime	Epact	Sunday Letter	First Sunday in Lent.	Easter day.	Ascendi. day.	Whit-sunday.	Trinity Sunday.
1621	7	17	G	Febr. 18	Aprill 1	May 10	May 20	May 27
1622	8	28	F	Mar. 10	21	30	Iune 9	Iune 16
1623	9	9	E	2	13	22	1	8
1624	10	20	D C	Febr. 15	Mar. 28	6	May 16	May 23
1625	11	1	B	March 6	Apr. 17	26	Iune 5	Iune 12
1626	12	12	A	Febr. 26	9	18	May 28	4
1627	13	23	G	11	Mar. 25	3	13	May 20
1628	14	4	F E	March 3	Apr. 13	22	Iune 1	Iune 8
1629	15	15	D	Febr. 22	5	14	May 24	May 31
1630	16	26	C	14	Mar. 28	6	16	23
1631	17	7	B	27	Apr. 10	19	29	Iune 5
1632	18	18	A G	18	1	10	20	May 27
1633	19	29	F	Mar. 10	21	30	Iune 9	Iune 16
1634	1	11	E	Febr. 23	6	15	May 25	1
1635	2	22	D	15	Mar. 29	7	17	May 24
1636	3	3	C B	March 6	Apr. 16	25	Iune 4	Iune 11
1637	4	14	A	Febr. 26	9	18	May 28	4
1638	5	25	G	11	March 5	3	13	May 20
1639	6	6	F	March 3	Apr. 14	23	Iune 2	Iune 9
1640	7	17	E D	Febr. 23	5	14	May 24	May 31
1641	8	28	C	March 7	25	Iune 3	Iune 13	Iune 20
1642	9	9	B	Febr. 27	10	May 19	May 29	5
1643	10	20	A	19	2	11	May 27	3
1644	11	1	G F	Mar. 10	21	30	9	May 16

January hath 31. dayes.

The Prime	Fast		Leng of y day.	True place and Declination					
				☉ in y ^r First yeare			☉ in y ^r secōd yeare		
				M.H	D.M.	D.M.	D.M.	D.M.	D.M.
viiij. 7.	1	A	Newe	7 52	1 21 38	21 47	1 21 23	21 49	
	2	B	years d.	7 54	2 22 39	21 37	2 22 24	21 39	
2. xvj.	3	C		7 58	3 23 40	21 27	3 23 25	21 29	
	4	D		8 0	4 24 41	21 16	4 24 27	21 18	
v. 8.	5	E	Fast	8 3	5 25 43	21 5	5 25 28	21 7	
	6	F	Twelwe	8 6	6 26 44	20 53	6 26 29	21 56	
i. xiiij.	7	G	day.	8 9	7 27 45	20 41	7 27 30	20 44	
ij. 10.	8	A	Lucian.	8 12	8 28 46	20 29	8 28 32	20 32	
x. 17.	9	B		8 15	9 29 47	20 16	9 29 33	20 19	
	10	C		8 18	10 [♁] 49	20 3	10 [♁] 34	20 6	
xviiij. 3.	11	D		8 21	11 1 50	19 49	11 1 38	19 53	
vij. 4.	12	E		8 24	12 2 51	19 37	12 2 36	19 39	
	13	F	Hillari.	8 28	13 3 52	19 21	13 3 37	19 25	
2. xv.	14	G		8 32	14 4 53	19 7	14 4 38	19 10	
	15	A		8 36	15 5 54	18 52	15 5 39	18 55	
iiij. 2.	16	B		8 40	16 6 55	18 37	16 6 40	18 40	
xij. 11.	17	C		8 43	17 7 56	18 21	17 7 42	18 25	
ix. 5.	18	D		8 46	18 8 57	18 5	18 8 42	18 9	
6. j.	19	E		8 49	19 9 58	17 49	19 9 4	17 53	
	20	F	Fabian	8 53	20 10 59	17 32	20 10 44	17 36	
	21	G	Agnes	8 55	21 12 0	17 15	21 11 45	17 19	
6. xvij.	22	A	Vincent	8 58	22 13 1	16 58	22 12 46	17 2	
	23	B		9 0	23 14 2	16 41	23 13 47	16 45	
vj. 4.	24	C		9 2	24 15 3	16 23	24 14 48	16 27	
	25	D	Con er	9 4	25 16 4	16 5	25 15 49	16 9	
3. xiiij. 2. ij	26	E	of P ul.	9 6	26 17 4	15 47	26 16 50	15 51	
ii. iiij.	27	F		9 9	27 18 5	15 28	27 17 51	15 32	
5. xj.	28	G		9 12	28 19 6	15 9	28 18 52	15 13	
xix. 4.	29	A		9 15	29 20 7	14 50	29 19 52	14 55	
i. viij.	30	B		9 18	30 21 7	14 31	30 20 53	4 35	
	31	C		9 21	31 22 8	14 11	31 21 53		

South Declination.

January.
of the Sunne.

☉ in ν third yere				☉ in ν Leap yere.					
D. M.		D. M.		D. M.		D. M.			
1	21	9	21	51	1	20	54	21	54
2	22	10	21	42	2	21	55	21	44
3	23	12	21	31	3	22	56	21	34
4	24	13	21	21	4	23	57	21	24
5	25	14	21	10	5	24	59	21	13
6	26	15	20	59	6	25	59	21	2
7	27	16	20	47	7	27	00	20	50
8	28	18	20	35	8	28	2	20	38
9	29	19	20	22	9	29	3	20	25
10	\approx	20	20	9	10	\approx	4	20	12
11	1	21	19	56	11	1	5	19	59
12	2	22	19	42	12	2	6	19	46
13	3	23	19	28	13	3	7	19	32
14	4	24	19	14	14	4	8	19	18
15	5	25	18	59	15	5	9	19	3
16	6	26	18	44	16	6	10	18	48
17	7	27	18	28	17	7	11	18	33
18	8	28	18	13	18	8	12	18	17
19	9	29	17	57	19	9	13	18	1
20	10	30	17	40	20	10	14	17	44
21	11	31	17	23	21	11	15	17	28
22	12	32	17	6	22	12	16	17	11
23	13	33	16	49	23	13	17	16	53
24	14	34	16	31	24	14	18	16	36
25	15	35	16	13	25	15	19	16	18
26	16	36	15	55	26	16	19	16	0
27	17	37	15	36	27	17	20	15	42
28	18	37	15	18	28	18	21	15	23
29	19	38	14	59	29	19	22	15	4
30	20	39	14	40	30	20	23	14	45
31	21	39	14	20	31	21	24	14	25

South Declination.

Certaine of the most notable fixed Starres of the 1. 2. and 3. bignesse; their Magnitude, Declination, and right ascention: whereby you may readily finde when any of them are in rule for obseruation.

1

Whales taylor, is a starre of the third bignes, whose declination is 20. degr. 12. minutes South, and the right ascention thereof, is 24. minutes of an houre.

2

Whales backe, of the third bignes, declination 12. Deg. 20. minutes South, and right ascention 50. minutes.

3

Rams hozne, is a starre of the third bignes, whose declination is 17. degrees 17. minutes North, and his right ascention is 1. houre 32. minutes.

4

Rams head of the third bignes, declination 21. degrees 33. minutes North, right ascention 1. houre 46. min.

D

February

February hath 28. dayes.

The Prime.			Leng. of the day.	True place and Declination											
				⊙ in ∞ First yere.			⊙ in ∞ secod yere								
				H.	M.	D. M. D. M.	D. M. D. M.	D. M. D. M.							
2. viij.	1	D	Fast	9	30	1	23	9	13	51	1	22	55	13	56
7. xvj.	2	E	Purific.	9	33	2	24	10	13	31	2	23	55	13	36
	3	F	of Mary	9	37	3	25	11	13	9	3	24	56	13	15
v.	4	G		9	41	4	26	11	12	50	4	25	56	12	55
xiiij. 12.	5	A	Agathe.	9	45	5	27	12	12	29	5	26	57	12	34
	6	B		9	50	6	28	12	12	8	6	27	57	12	14
4. ij.	7	C		9	54	7	29	12	11	48	7	28	58	11	52
x.	8	D		9	58	8	✕	13	11	36	8	29	58	11	31
	9	E		10	2	9	1	13	11	5	9	✕	59	11	10
8. xviiij.	10	F		10	6	10	2	14	10	43	10	1	59	10	49
2. vij.	11	G		10	9	11	3	14	10	21	11	2	59	10	27
	12	A		10	12	12	4	14	10	0	12	3	59	10	5
7. xv.	13	B		10	15	13	5	15	9	37	13	4	59	9	43
	14	C	Valent.	10	18	14	6	15	9	15	14	5	59	9	21
10. iiij.	15	D		10	22	15	7	15	8	53	15	7	0	8	58
3. xij.	16	E		10	26	16	8	15	8	30	16	8	0	8	36
j. 6.	17	F		10	30	17	9	15	8	8	17	9	0	8	14
	18	G		10	34	18	10	15	7	45	18	10	0	7	51
5. ix.	19	A		10	38	19	11	16	7	22	19	11	0	7	28
xviiij. 11.	20	B		10	42	20	12	16	6	59	20	12	0	7	5
	21	C		10	46	21	13	16	6	56	21	13	0	6	42
	22	D		10	50	22	14	16	6	13	22	14	0	6	19
3. vj.	23	E	Fast	10	54	23	15	16	5	50	23	15	0	5	56
xiiij. 11.	24	F	Mathias	10	58	24	16	15	5	27	24	16	0	5	32
2. iiij.	25	G		11	2	25	17	15	5	3	25	17	0	5	9
xj. 5.	26	A		11	7	26	18	15	4	40	26	18	0	4	46
	27	B		11	12	27	19	15	4	16	27	19	0	4	22
1. xix.	28	C		11	16	28	20	15	3	53	28	20	0	3	58
	29														

South Declination.

When it is Leap yeare February hath 29. dayes, and then is S. Mathias the 25. day.

March hath 31. dayes.

The Prime			Leng. of the day	True place and Declination					
				in \times First yeare.			in \times secōdyere		
				H, M.	D. M.	D. M.	D. M.	D. M.	D. M.
	1	D	Dauid.	11 20	1 21 14	3 29	1 21 0	3 35	
7. viij.	2	E		11 24	2 22 14	3 6	2 21 59	3 11	
xvj. 11.	3	F		11 28	3 23 13	2 42	3 22 59	2 48	
	4	G		11 32	4 24 13	2 18	4 23 59	2 24	
	5	A		11 36	5 25 13	1 54	5 24 58	2 0	
10. v.	6	B		11 40	6 26 12	1 30	6 25 58	1 37	
1. xiiij. 6	7	C		11 44	7 27 12	1 7	7 26 57	1 13	
	8	D		11 48	8 28 11	0 43	8 27 57	0 49	
8. x.	9	E		11 52	9 29 10	0 20	9 28 56	0 26	
xviij. 7.	10	F		11 56	10 30 10	0 4	10 29 55	0 2	
	11	G	Gregor.	12 0	11 1 9	0 27	11 30 55	0 22	
	12	A		12 4	12 2 8	0 51	12 1 54	0 45	
8. viij.	13	B		12 8	13 3 8	1 15	13 2 53	1 9	
xv. 9.	14	C		12 12	14 4 7	1 38	14 3 53	1 33	
	15	D		12 16	15 5 6	2 2	15 4 52	1 56	
iiij.	16	E		12 20	16 6 5	2 25	16 5 51	2 20	
xij. 6.	17	F		12 24	17 7 4	2 49	17 6 50	2 43	
	18	G	Edward	12 28	18 8 4	3 13	18 7 49	3 7	
5. j.	19	A		12 32	19 9 3	3 36	19 8 48	3 30	
ix. 10.	20	B	Benedic.	12 36	20 10 2	3 59	20 9 47	3 53	
	21	C		12 40	21 11 0	4 22	21 10 46	4 17	
xviij. 6.	22	D		12 43	22 11 58	4 45	22 11 45	4 40	
vj. 11.	23	E		12 47	23 12 58	5 8	23 12 44	5 3	
	24	F	Fast	12 50	24 13 57	5 31	24 13 43	5 26	
1. xiiij.	25	G	Anunti-	12 54	25 14 56	5 54	25 14 42	5 49	
iiij. 8.	26	A	ation of	12 58	26 15 55	6 17	26 15 41	6 12	
	27	B	Mary.	13 2	27 16 53	6 39	27 16 40	6 34	
9. xj.	28	C		13 6	28 17 52	7 2	28 17 38	6 56	
xix. 3.	29	D		13 12	29 18 51	7 25	29 18 36	7 19	
	30	E		13 18	30 19 49	7 47	30 19 35	7 41	
viiij. 10.	31	F		13 24	31 20 48	8 9	31 20 34	8 4	

South Declination.

North Declination.

March.

of the Sunne.

☉ in * third yeare				☉ in * Leap yeare.					
D.	M.	D.	M.	D.	M.	D.	M.		
1	20	45	3	41	1	21	30	3	23
2	21	45	3	17	2	22	30	3	0
3	22	45	2	53	3	23	30	2	35
4	23	44	2	30	4	24	29	2	12
5	24	44	2	6	5	25	28	1	49
6	25	43	1	42	6	26	28	1	25
7	26	43	1	19	7	27	27	1	1
8	27	42	0	55	8	28	26	0	38
9	28	42	0	31	9	29	26	0	14
10	29	41	0	8	10	✓	25	0	10
11	✓	40	0	16	11	1	25	0	34
12	1	40	0	40	12	2	24	0	57
13	2	39	1	3	13	3	23	1	21
14	3	38	1	27	14	4	22	1	44
15	4	37	1	50	15	5	22	2	8
16	5	37	2	14	16	6	21	2	32
17	6	35	2	37	17	7	20	2	55
18	7	35	3	1	18	8	19	3	19
19	8	34	3	25	19	9	18	3	42
20	9	33	3	48	20	10	17	4	5
21	10	32	4	11	21	11	15	4	28
22	11	31	4	34	22	12	14	4	51
23	12	30	4	57	23	13	13	5	14
24	13	29	5	20	24	14	12	5	37
25	14	28	5	43	25	15	11	6	0
26	15	26	6	6	26	16	10	6	23
27	16	25	6	29	27	17	8	6	45
28	17	24	6	21	28	18	7	7	9
29	18	23	7	14	29	19	6	7	30
30	19	21	7	36	30	20	4	7	52
31	20	20	7	58	31	21	3	8	15

South Declination.

North Declination.

10

The great Dog is a starre of the first bignes, whose declination is 16. degrees 12. minutes Southwards, and his right ascention 6. houres 27. minutes.

11

The little Dog is a starre of the first bignes, declination is 6. deg. 13. min. North, right ascention 7. houres 18. minutes.

12

Brightest in Hidra is a starre of the second bignes, declination 6. deg. 53. min. South, right ascention 9. houres 8. minutes.

13

Lyons heart of the first bignes, declination 13. degrees 55. minutes North, right ascention 9. houres, 57. minutes.

14

Lyons necke of the second bignes, declination 21. degrees 52. minutes North, right ascention 9. houres 46. minutes.

D 3

April

Aprill hath 30. dayes.

The Prime		Leng. of the day	True place and Declination					
			☉ in V First yeare.			☉ in V secōdyere		
			M. H	D. M	D. M.	D. M.	D. M.	D. M.
xvj. 4.	1 G	13 30	1	21 46	8 31	1	21 32	8 25
	2 A	13 34	2	22 45	8 53	2	22 31	8 48
v.	3 B	13 38	3	23 44	9 15	3	23 30	9 9
xiiij. 8.	4 C	13 42	4	24 42	9 36	4	24 28	9 31
7. ij.	5 D	13 46	5	25 41	9 58	5	25 27	9 53
x. 5.	6 E	13 50	6	26 39	10 19	6	26 25	10 14
	7 F	13 53	7	27 37	10 40	7	27 23	10 35
2. xvij.	8 G	13 56	8	28 36	11 1	8	28 22	10 56
	9 A	13 59	9	29 34	11 22	9	29 20	11 17
vij. 8.	10 B	14 2	10	30 32	11 42	10	30 18	11 37
	11 C	14 5	11	1 31	12 3	11	1 17	11 58
2. xv.	12 D	14 8	12	2 29	12 22	12	2 15	12 18
iiij. 8.	13 E	14 12	13	3 27	12 43	13	3 13	12 38
	14 F	14 16	14	4 25	13 2	14	4 11	12 58
9. xij.	15 G	14 20	15	5 24	13 22	15	5 9	13 17
1. 9.	16 A	14 24	16	6 23	13 42	16	6 8	13 37
	17 B	14 28	17	7 20	14 1	17	7 6	13 56
ix. 2.	18 C	14 32	18	8 18	14 19	18	8 4	14 15
	19 D	14 36	19	9 16	14 38	19	9 2	14 34
2. xvij.	20 E	14 40	20	10 14	14 56	20	10 0	14 52
vj.	21 F	14 44	21	11 12	15 15	21	10 58	15 10
xiiij. 8.	22 G	14 47	22	12 10	15 33	22	11 56	15 28
	23 A	14 50	23	13 8	15 50	23	12 54	15 46
7. iiij.	24 B	14 53	24	14 7	16 8	24	13 51	16 3
xj. 2.	25 C	14 56	25	15 3	16 25	25	14 49	16 20
	26 D	14 59	26	16 2	16 42	26	15 47	16 37
7. xix.	27 E	15 2	27	16 59	16 58	27	16 45	16 54
	28 F	15 5	28	17 56	17 14	28	17 43	17 11
viiij. 2.	29 G	15 8	29	18 54	17 30	29	18 40	17 26
	30 A	15 12	30	19 52	17 45	30	19 38	17 42

North Declination.

Ambro.

S. Geor.
Fast
S. Mark.

Aprill.
of the Sunne.

☉ in V third yere.		☉ in V Leap yere.	
D.	M.	D.	M.
1	21 18	8	20
2	22 17	8	42
3	23 16	9	4
4	24 14	9	26
5	25 13	9	47
6	26 11	10	9
7	27 10	10	30
8	28 8	10	51
9	29 6	11	12
10	8 4	11	32
11	1 3	11	53
12	2 1	12	13
13	2 59	12	33
14	3 57	12	53
15	4 55	13	11
16	5 54	13	32
17	6 52	13	51
18	7 50	14	10
19	8 48	14	29
20	9 46	14	48
21	10 44	15	6
22	11 42	15	24
23	12 39	15	41
24	13 37	15	59
25	14 35	16	16
26	15 33	16	33
27	16 31	16	51
28	17 29	17	7
29	18 26	17	23
30	19 24	17	38

North Declination.

Lyons backe is a floure of the second bignes, whose declination is 22. degrees 43. minutes Northward, and his right ascension is 10. houres 52. minutes.

Lyons taylor of the first bignes, declination 16. degrees 50. minutes North, right ascension 11. houres 29. minutes.

Rauens wing of the third bignes, declination 15. degrees 16. minutes South, right ascension 11. houres 56. minutes.

Virgins spike of the first bignes, declination 9. degrees South, right ascension 13. houres 5. minutes.

May hath 31. dayes.

The Prime	Fast	Leng. of the day M. H.	True place and Declination					
			☉ in & First yeare.			☉ in & secōdyere		
			D. M.	D. M.	D. M.	D. M.	D. M.	D. M.
II. viij.	1 B Phil. &	15 16	1 20 50	18 2	1 20 36	17 58		
6. xvj.	2 C Iacob.	15 20	2 21 47	18 17	2 21 34	18 13		
v. 9.	3 D Inuenti.	15 23	3 22 45	18 32	3 22 31	18 28		
	4 E crosse.	15 26	4 23 43	18 46	4 23 29	18 43		
8. xiiij. ij 4	5 F	15 29	5 24 40	19 0	5 24 26	18 57		
	6 G Io. Port.	15 32	6 25 38	19 14	6 25 24	19 11		
4. x.	7 A Latin.	15 35	7 26 35	19 28	7 26 22	19 25		
	8 B	15 38	8 27 33	19 41	8 27 19	19 38		
xviiij. 9.	9 C	15 40	9 28 30	19 54	9 28 17	19 51		
	10 D	15 42	10 29 28	20 7	10 29 14	20 3		
3. vij.	11 E	15 44	11 ^{II} 25 20	19	11 ^{II} 12 20	16		
xv. 8.	12 F	15 46	12 1 23	20 31	12 1 10	20 28		
	13 G	15 48	13 2 20	20 42	13 2 6	20 39		
8. iiij.	14 A	15 50	14 3 18	20 53	14 3 4	20 51		
xij.	15 B	15 53	15 4 15	21 4	15 4 1	21 2		
	16 C	15 56	16 5 12	21 15	16 4 59	21 12		
j.	17 D	15 58	17 6 10	21 25	17 5 56	21 22		
	18 E	16 0	18 7 7	21 35	18 6 53	21 32		
6. ix.	19 F Dunstan	16 3	19 8 5	21 44	19 7 51	21 42		
xvij. II.	20 G	16 6	20 9 2	21 53	20 8 48	21 51		
vj. 8.	21 A	16 9	21 9 59	22 2	21 9 45	22 0		
	22 B	16 12	22 10 56	22 10	22 10 43	22 8		
8. xiiij.	23 C	16 14	23 11 54	22 18	23 11 40	22 16		
iiij. I.	24 D	16 16	24 12 51	22 25	24 12 37	22 23		
	25 E	16 18	25 13 48	22 32	25 13 35	22 31		
10. xj.	26 F August.	16 20	26 14 45	22 39	26 14 32	22 37		
xix. 6.	27 G	16 22	27 15 43	22 45	27 15 29	22 44		
	28 A	16 24	28 16 40	22 51	28 16 26	22 50		
	29 B	16 26	29 17 37	22 57	29 17 24	22 56		
8. viij.	30 C	16 27	30 18 34	23 2	30 18 20	23 1		
xvi. 6.	31 D	16 28	31 19 31	23 7	31 19 18	23 6		

North Declination.

May.
of the Sunne.

☉ in ♂ third yere.				☉ in ♂ Leap yere.					
D.	M.	D.	M.	D.	M.	D.	M.		
1	20	22	17	54	1	21	6	18	6
2	21	20	18	10	2	22	3	18	21
3	22	17	18	24	3	23	1	18	36
4	23	16	18	39	4	23	58	18	50
5	24	13	18	54	5	24	56	19	4
6	25	10	19	8	6	25	54	19	18
7	26	8	19	21	7	26	52	19	32
8	27	5	19	35	8	27	49	19	45
9	28	3	19	48	9	28	46	19	57
10	29	0	20	0	10	29	44	20	10
11	29	58	20	13	11	II	41	20	22
12	II	55	20	25	12	I	39	20	34
13	I	53	20	37	13	2	36	20	45
14	2	50	20	48	14	3	33	20	56
15	3	47	20	59	15	4	31	21	7
16	4	45	21	10	16	5	29	21	18
17	5	42	21	20	17	6	26	21	28
18	6	39	21	30	18	7	23	21	37
19	7	37	21	40	19	8	20	21	46
20	8	34	21	49	20	9	18	21	55
21	9	32	21	58	21	10	15	22	4
22	10	29	22	6	22	11	12	22	12
23	11	26	22	14	23	12	9	22	20
24	12	23	22	22	24	13	7	22	27
25	13	21	22	29	25	14	4	22	34
26	14	18	22	36	26	15	1	22	41
27	15	15	22	42	27	15	58	22	47
28	16	12	22	48	28	16	56	22	53
29	17	10	22	54	29	17	53	22	58
30	18	7	23	59	30	18	50	23	3
31	19	4	23	4	31	19	47	23	8

North Declination.

Arcturus or betwixt boots
thighes, is a starre of the first
bignes, whose declination is
21. degrees 20. min. North,
and his right ascention is 13
houres 56. minutes.

20

South Balance of the se-
cond bignes, declination 14.
degrees 14. minutes South,
right ascention 14. houres
30. minutes.

21

North Balance of the se-
cond bignes, declination 7.
degrees 46. minutes South,
right ascention 14. houres
55. minutes.

22

Scorpions heart is a starre
of the first bignes, whose de-
clination is 25. degrees 25.
minutes South, right ascen-
tion 16. houres 6. minutes.

June

June hath 30. dayes.

The Prime.			Leng. of the day.	True place and Declination.										
				⊙ in II First yeare				⊙ in II secōd yere.						
				H.	M.	D.	M.	D.	M.	D.	M.			
	1	E	16 28	1	20	29	23	11	1	20	15	23	10	
3. v.	2	F	16 28	2	21	26	23	15	2	21	12	23	14	
1. xiiij.	3	G	16 29	3	22	23	23	18	3	22	9	23	17	
7. ij.	4	A	16 29	4	23	20	23	21	4	23	6	23	21	
x. io.	5	B	Bonifac.	16 29	5	24	17	23	24	5	24	4	23	23
	6	C		16 29	6	25	14	23	26	6	25	1	23	26
xviiij. 6.	7	D		16 30	7	26	11	23	28	7	25	58	23	28
	8	E		16 30	8	27	9	23	30	8	26	55	23	29
vij. 8.	9	F		16 30	9	28	6	23	31	9	27	52	23	30
	10	G		16 30	10	29	3	23	31	10	28	49	23	31
9. xv.	11	A	Barnaby	16 30	11	30	0	23	31	11	29	46	23	31
11. iiij.	12	B		16 30	12	57	23	31	12	57	43	23	31	
xij. io.	13	C		16 30	13	54	23	31	13	54	40	23	31	
	14	D		16 30	14	51	23	30	14	51	38	23	30	
	15	E		16 30	15	48	23	28	15	48	35	23	29	
9. j.	16	F		16 30	16	45	23	26	16	45	32	23	27	
ix. 9.	17	G		16 29	17	42	23	24	17	42	29	23	25	
	18	A		16 29	18	38	23	21	18	38	26	23	22	
xvij. 2.	19	B		16 28	19	37	23	18	19	37	23	23	19	
8. vj.	20	C	Edward	16 27	20	34	23	15	20	34	20	23	16	
xiiij.	21	D		16 26	21	31	23	11	21	31	17	23	12	
iiij. 11.	22	E		16 25	22	28	23	7	22	28	14	23	8	
	23	F	Fast	16 24	23	25	23	2	23	25	11	23	3	
xj. 3.	24	G	John Ba.	16 23	24	22	22	57	24	22	8	22	58	
	25	A		16 22	25	19	22	51	25	19	6	22	53	
3. xix.	26	B		16 20	26	16	22	45	26	16	3	22	47	
	27	C		16 18	27	14	22	39	27	15	0	22	41	
viiij. 4.	28	D	Fast	16 16	28	11	22	32	28	15	57	22	34	
	29	E	S. Peter.	16 14	29	8	22	25	29	16	54	22	27	
8. xvj.	30	F		16 13	30	5	22	18	30	17	51	22	20	

North Declination.

☉ in II third yeare					☉ in II Leap yeare.				
D.	M.	D.	M.		D.	M.	D.	M.	
1	20	2	23	9	1	20	44	23	12
2	20	58	23	13	2	21	42	23	16
3	21	55	23	17	3	22	40	23	19
4	22	53	23	20	4	23	36	23	22
5	23	50	23	23	5	24	33	23	25
6	24	47	23	25	6	25	30	23	27
7	25	44	23	27	7	26	27	23	29
8	26	41	23	29	8	27	24	23	30
9	27	38	23	30	9	28	21	23	30
10	28	35	23	31	10	29	19	23	31
11	29	32	23	31	11	30	17	23	31
12	30	30	23	31	12	1	13	23	31
13	1	27	23	31	13	2	10	23	30
14	2	24	23	30	14	3	7	23	29
15	3	21	23	29	15	4	4	23	28
16	4	18	23	27	16	5	1	23	26
17	5	15	23	25	17	5	58	23	23
18	6	12	23	23	18	6	55	23	21
19	7	9	23	20	19	7	52	23	17
20	8	6	23	17	20	8	49	23	14
21	9	2	23	13	21	9	47	23	10
22	10	0	23	9	22	10	45	23	5
23	10	58	23	4	23	11	41	23	0
24	11	55	22	59	24	12	38	22	55
25	12	52	22	54	25	13	35	22	50
26	13	49	22	48	26	14	32	22	44
27	14	46	22	42	27	15	29	22	37
28	15	43	22	36	28	16	26	22	31
29	16	40	22	29	29	17	23	22	23
30	17	37	22	22	30	18	21	22	16

North Declination.

Hercules head is a starre of the third bignes, whose declination is 14. degrees 57 minutes North, and right ascension 16. houres 56. minutes.

Eagles heart is a starre of the second bignes, declination 17. degrees, 54. min. North, right ascension 19. houres 32. minutes.

Dolphins tayle of the third bignes, declination 10 degrees North, right ascension 20. houres, 16. minutes.

Goates tayle of the third bignes, declination 17. degrees 51. minutes South, right ascension 21. houres 27. minutes.

July hath 31. dayes.

The Prime.				Leng. of the day.	True place and Declination.									
					☉ in the First yeare				☉ in the secōd yere.					
					H. M.		D. M.		D. M.		D. M.			
2. v.	1	G	Vifitati.	16 12	1	19	2	22	10	1	18	48	22	12
xiiij. 8.	2	A	Mary:	16 10	2	19	59	22	2	2	19	45	22	4
ij. 7.	3	B	Martin	16 8	3	20	56	21	53	3	20	43	21	55
	4	C		16 6	4	21	53	21	44	4	21	40	21	46
x.	5	D		16 4	5	22	51	21	35	5	22	37	21	37
	6	E		16 1	6	23	48	21	25	6	23	34	21	28
4. xviiij.	7	F		15 57	7	24	45	21	15	7	24	31	21	18
	8	G		15 54	8	25	42	21	5	8	25	29	21	7
9. vij.	9	A		15 51	9	26	39	20	54	9	26	26	20	56
xv.	10	B		15 48	10	27	37	20	43	10	27	23	20	45
iiiiij. 8.	11	C		15 46	11	28	35	20	31	11	28	20	20	34
	12	D		15 44	12	29	31	20	19	12	29	17	20	22
3. xij.	13	E		15 41	13	28	28	20	7	13	28	15	20	10
	14	F		15 38	14	1	26	19	55	14	1	12	19	58
j. 6.	15	G	Swithin.	15 35	15	2	23	19	42	15	2	9	19	45
	16	A		15 32	16	3	20	19	29	16	3	7	19	32
2. ix.	17	B		15 29	17	4	18	19	15	17	4	4	19	18
xvij. 10.	18	C		15 26	18	5	15	19	1	18	5	1	19	5
vj.	19	D	dog.d.b.	15 23	19	6	12	18	47	19	5	59	18	51
xiiiij. 8.	20	E	Margr.	15 20	20	7	10	18	33	20	6	56	18	36
	21	F		15 17	21	8	7	18	18	21	7	53	18	22
iiij.	22	G	Magda.	15 13	22	9	4	18	3	22	8	51	18	7
	23	A		15 10	23	10	2	17	48	23	9	48	17	51
6. xj.	24	B	Fast	15 8	24	10	59	17	32	24	10	46	17	36
xix. 11.	25	C	S. Iames	15 5	25	11	57	17	16	25	11	43	17	20
	26	D	Anna	15 3	26	12	54	17	0	26	12	40	17	4
	27	E		15 0	27	13	52	16	43	27	13	38	16	47
9. viij.	28	F		14 57	28	14	49	16	27	28	14	35	16	31
xvj.	29	G		14 55	29	15	47	16	10	29	15	33	16	14
v. 7.	30	A		14 52	30	16	44	15	52	30	16	31	15	57
	31	B		14 50	31	17	42	15	35	31	17	28	15	39

North Declination.

July.

of the Sunne.

☉ in 3 rd yeare				☉ in 3 rd Leap yeare.					
D.	M.	D.	M.	D.	M.	D.	M.		
1	18	34	22	14	1	19	17	22	8
2	19	32	22	6	2	20	15	22	0
3	20	29	22	57	3	21	13	21	51
4	21	26	21	49	4	22	9	21	42
5	22	23	21	40	5	23	7	21	32
6	23	20	21	30	6	24	4	21	22
7	24	17	21	20	7	25	0	21	12
8	25	15	21	10	8	25	58	21	2
9	26	12	20	59	9	26	55	20	51
10	27	9	20	48	10	27	53	20	40
11	28	6	20	37	11	28	50	20	28
12	29	4	20	25	12	29	47	20	16
13	30	1	20	13	13	30	44	20	4
14	1	0	19	2	14	1	42	19	51
15	1	53	19	49	15	2	39	19	38
16	2	50	19	36	16	3	36	19	25
17	3	47	19	22	17	4	33	19	12
18	4	45	19	9	18	5	31	18	58
19	5	42	18	55	19	6	28	18	43
20	6	39	18	41	20	7	26	18	29
21	7	37	18	26	21	8	23	18	14
22	8	34	18	11	22	9	20	17	59
23	9	32	17	57	23	10	18	17	43
24	10	30	17	40	24	11	15	17	28
25	11	27	17	24	25	12	13	17	12
26	12	24	17	9	26	13	10	16	56
27	13	22	16	52	27	14	8	16	39
28	14	19	16	36	28	15	5	16	22
29	15	17	16	19	29	16	3	16	5
30	16	14	16	2	30	17	0	15	48
31	17	12	15	44	31	17	58	15	30

North Declination.

27

Pegasus shoulder of the 2. bignes, declination 12. degr. 58. min. North, right ascension 22. houres 46. minutes.

28

Pegasus Leg, of the third bignes, declination 25. degr. 58. minutes North, right ascension 22. houres 44. minutes.

29

Swans taylor, is a starre of the second bignes, whose declination is 43. degr. 54. min. North, right ascension 20. houres 30. minutes.

30

The Waggoners right shoulder is a starre of the second bignes, declination 44. degrees 49. minutes North, and right ascension 5. houres 30. minutes.

31

Hircus the Goate of the first bignes, declination 45. degrees 30. minutes, right ascension 4. houres, 49. minutes.

32

Lira of the first bignes, North declination 38. degrees 30. minutes, right ascension 18. houres 20. minutes.

August

August hath 31. dayes.

The Prime			Leng. of the day	True place and Declination				
				H. M.	☉ in ♀ First yeare.		☉ in ♀ secōdyere	
					D. M.	D. M.	D. M.	D. M.
6. xiiij.	1	C	Lāmas.	14 46	1 18 40	15 17	1 18 26	15 21
2. ij.	2	D		14 42	2 19 37	14 59	2 19 23	15 4
	3	E		14 38	3 20 35	14 41	3 20 21	14 45
7. x.	4	F		14 34	4 21 33	14 22	4 21 19	14 27
xviiij. 9.	5	G		14 30	5 22 30	14 4	5 22 17	14 8
	6	A		14 26	6 23 28	13 45	6 23 14	13 49
vij.	7	B		14 22	7 24 26	13 25	7 24 12	13 30
xv. 7.	8	C		14 18	8 25 24	13 5	8 25 10	13 10
	9	D		14 15	9 26 21	12 47	9 26 8	12 51
5. iiij.	10	E	Lawren.	14 12	10 27 19	12 27	10 27 5	12 32
xij. ii.	11	F		14 9	11 28 17	12 7	11 28 3	12 12
	12	G		14 6	12 29 15	11 47	12 29 1	11 51
	13	A		14 3	13 30 13	11 26	13 29 59	11 31
3. j.	14	B		14 0	14 1 11	11 6	14 30 57	11 11
ix. 12.	15	C		13 56	15 2 9	10 45	15 1 55	10 51
	16	D		13 52	16 3 7	10 24	16 2 53	10 29
vj. 7. xvij	17	E		13 50	17 4 5	10 3	17 3 51	10 8
	18	F		13 44	18 5 3	9 42	18 4 49	9 47
9. xiiij.	19	G		13 40	19 6 1	9 20	19 5 47	9 25
	20	A		13 35	20 6 59	8 59	20 6 45	9 4
8. iiij.	21	B		13 30	21 7 57	8 37	21 7 43	8 42
xj. 9.	22	C		13 25	22 8 55	8 15	22 8 41	8 21
	23	D	Fast	13 20	23 9 53	7 53	23 9 40	7 58
xix. 4.	24	E	Barthol.	13 15	24 10 51	7 31	24 10 36	7 37
	25	F	Apostle.	13 10	25 11 50	7 9	25 11 34	7 15
viiij.	26	G		13 6	26 12 48	6 47	26 12 33	6 52
xvj. 8.	27	A		13 2	27 13 46	6 24	27 13 31	6 30
	28	B		12 58	28 14 44	6 2	28 14 29	6 8
7. v.	29	C	Behead.	12 54	29 15 43	5 39	29 15 28	5 45
xiiij. 5.	30	D	of Iohn.	12 51	30 16 42	5 16	30 16 26	5 22
	31	E		12 48	31 17 40	4 53	31 17 25	4 59

North Declination.

August.
of the Sunne.

☉ in 3. third yeare				☉ in 1. Leap yeare.					
D.	M.	D.	M.	D.	M.	D.	M.		
1	18	12	15	26	1	18	56	15	12
2	19	9	15	8	2	19	54	14	54
3	20	7	14	50	3	20	51	14	36
4	21	5	14	31	4	21	48	14	17
5	22	2	14	13	5	22	46	13	59
6	23	0	13	54	6	23	44	13	39
7	23	58	13	25	7	24	42	13	20
8	24	56	13	15	8	25	40	13	1
9	25	53	12	56	9	26	37	12	41
10	26	51	12	36	10	27	35	12	21
11	27	49	12	16	11	28	33	12	1
12	28	47	11	56	12	29	31	11	41
13	29	45	11	36	13	☿	29	11	20
14	☿	43	11	16	14	1	27	11	0
15	1	41	10	55	15	2	25	10	39
16	2	39	10	34	16	3	23	10	18
17	3	37	10	13	17	4	21	9	57
18	4	35	9	52	18	5	19	9	36
19	5	33	9	31	19	6	17	9	14
20	6	31	9	9	20	7	15	8	53
21	7	29	8	48	21	8	13	8	31
22	8	27	8	26	22	9	11	8	9
23	9	25	8	4	23	10	9	7	47
24	10	23	7	42	24	11	8	7	25
25	11	22	7	20	25	12	6	7	3
26	12	20	6	57	26	13	5	6	40
27	13	19	6	35	27	14	3	6	18
28	14	17	6	12	28	15	1	5	55
29	15	15	5	50	29	15	59	5	33
30	16	14	5	27	30	16	58	5	10
31	17	12	5	4	31	17	56	4	47

North Declination.

33
Perseus right side of the se^d
cond bignes, declination 47.
degr. North, right ascention
2. houres 56. minutes.

34
Fomahand, is a starre of the
first bignes, hauing South
declination 33. degr. 15. mi-
nutes, and right ascention
22. houres, 40. minutes.

35
In the knee of Sagitarius,
is a starre of the second big-
nes, hauing South declina-
tion 42. deg. and right ascen-
tion 18. houres 44. min.

Starres neare about the North
Pole, with their distance
from the said Pole.

1
The Pole starre is of the
third bignes, whose distance
from the Pole is 2. degr. 52.
min. and his right ascention
is 50. minutes.

2
The formost Guard of the
2. bignes, distant from the
Pole 14. degr. 11. min. right
ascention 14. hour. 54. min.

3
The hindermost Guard, of
the 2. bignes, distant 16. deg.
42. min, right ascention 15.
houres 26. minutes.

Septem-

September hath 30. dayes.

The Prime.			Leng. of the day.	True place and Declination.					
				H. M.		⊙ in 1 st First yere.		⊙ in 1 st secōd yere.	
				D. M.	D. M.	D. M.	D. M.	D. M.	D. M.
12. ij.	1	F	Giles.	12 48	1 18 39	4 30	1 18 24	4 36	
x. 8.	2	G		12 44	2 19 37	4 8	2 19 23	4 13	
	3	A		12 40	3 20 36	3 44	3 20 22	3 50	
3. xvij.	4	B		12 36	4 21 35	3 21	4 21 20	3 27	
vij. 7.	5	C	Dog da.	12 32	5 22 33	2 58	5 22 19	3 4	
	6	D	end.	12 28	6 23 32	2 35	6 23 18	2 40	
9. xv.	7	E	Nat. Eli.	12 24	7 24 31	2 11	7 24 16	2 17	
iiij. 9.	8	F	Nat. Ma	12 20	8 25 29	1 48	8 25 15	1 54	
	9	G		12 16	9 26 28	1 25	9 26 13	1 31	
xij. 2.	10	A		12 12	10 27 27	1 1	10 27 12	1 7	
	11	B		12 8	11 28 26	0 38	11 28 11	0 43	
j. ii.	12	C		12 4	12 29 25	0 14	12 29 10	0 20	
	13	D		12 0	13 24	0 10	13 24 9	0 4	
2. ix.	14	E	Hol. cro	11 56	14 1 23	0 33	14 1 8	0 27	
xvij. 8.	15	F		11 52	15 2 21	0 56	15 2 7	0 51	
8. vj.	16	G		11 48	16 3 20	1 20	16 3 6	1 14	
xiiij. 2.	17	A	Lamber	11 44	17 4 19	1 43	17 4 5	1 38	
	18	B		11 40	18 5 18	2 7	18 5 4	2 1	
iiij. 7.	19	C		11 36	19 6 18	2 31	19 6 3	2 25	
	20	D	Fast	11 32	20 7 17	2 54	20 7 2	2 48	
xj. 2.	21	E	Mathe.	11 28	21 8 16	3 17	21 8 1	3 11	
	22	F		11 24	22 9 15	3 41	22 9 0	3 35	
5. xix.	23	G		11 20	23 10 15	4 4	23 10 0	3 58	
vij. 9.	24	A		11 16	24 11 14	4 28	24 10 59	4 22	
	25	B	Ciprian.	11 12	25 12 13	4 51	25 11 59	4 45	
8. xvj.	26	C		11 8	26 13 13	5 14	26 12 58	5 8	
v. 5.	27	D		11 4	27 14 12	5 37	27 13 58	5 32	
	28	E	Fast	11 0	28 15 12	6 0	28 14 57	5 55	
4. xiiij.	29	F	S. Mich.	10 56	29 16 11	6 23	29 15 57	6 18	
ij. 6.	30	G	Hierom	10 52	30 17 11	6 46	30 16 56	6 41	

North Declination.

South Declination.

September.
of the Sunne.

☉ in m^{e} third yeare				☉ in m^{e} Leap yeare.					
D.	M.	D.	M.	D.	M.	D.	M.		
1	18	11	4	41	1	18	55	4	24
2	19	9	4	19	2	19	53	4	1
3	20	8	3	55	3	20	52	3	38
4	21	6	3	32	4	21	51	3	15
5	22	5	3	9	5	22	49	2	52
6	23	3	2	46	6	23	48	2	28
7	24	2	2	23	7	24	47	2	5
8	25	1	1	59	8	25	46	1	41
9	26	0	1	36	9	26	45	1	18
10	26	58	1	13	10	27	43	0	55
11	27	57	0	49	11	28	42	0	31
12	28	56	0	26	12	29	41	0	35
13	29	55	0	2	13	29	40	0	16
14	29	54	0	22	14	1	39	0	40
15	1	53	0	45	15	2	38	1	3
16	2	52	1	9	16	3	37	1	27
17	3	51	1	32	17	4	36	1	50
18	4	50	1	56	18	5	35	2	14
19	5	49	2	19	19	6	34	2	37
20	6	48	2	43	20	7	33	3	0
21	7	47	3	6	21	8	32	3	24
22	8	47	3	30	22	9	32	3	47
23	9	46	3	53	23	10	31	4	11
24	10	45	4	16	24	11	30	4	34
25	11	45	4	40	25	12	30	4	57
26	12	44	5	3	26	13	29	5	20
27	13	43	5	26	27	14	29	5	44
28	14	43	5	49	28	15	28	6	7
29	15	42	6	12	29	16	27	6	29
30	16	42	6	35	30	17	27	6	22

North Declination.

South Declination.

4

The end of the Dragons
tayle of the third bignes, di-
stant from the Pole 18. deg.
26. min. right ascention 11.
houres 8. minutes.

5

The great Beares backe of
the second bignes, distant
from the Pole 26. degrees 5.
minutes right ascention 10.
hour. 40. minutes.

6

Cepheus right shoulder of
the third bignes, distant 29.
degrees, right ascention 21.
houres 10. minutes.

7

The great Beares side, of
the second bignes, distant 31
deg. 26. min. right ascention
10. houres, 58. minutes.

8

The first in her tayle of the
second bignes, distant 31. de-
grees 49. min. right ascention
12. houres 32. min.

☉ October

October hath 31. dayes.

The Prime.			Leng. of the day.	True place and Declination									
				☉ in = First yere.				☉ in = secōd yere.					
				H.	M.	D.	M.	D.	M.	D.	M.		
	1	A	10 48	1	18	10	7	9	1	17	56	7	4
2. x.	2	B	10 44	2	19	10	7	32	2	18	55	7	26
xviiij. 10.	3	C	10 40	3	20	9	7	54	3	19	55	7	49
	4	D	10 36	4	21	9	8	17	4	20	55	8	12
8. vij.	5	E	10 32	5	22	9	8	39	5	21	54	8	34
xv.	6	F	10 28	6	23	9	9	2	6	22	54	8	56
	7	G	10 24	7	24	8	9	24	7	23	54	9	18
iiij. I.	8	A	10 20	8	25	8	9	46	8	24	54	9	40
	9	B	10 16	9	26	8	10	8	9	25	54	10	2
4. xij.	10	C	10 12	10	27	8	10	29	10	26	53	10	24
	11	D	10 8	11	28	8	10	51	11	27	53	10	46
j.	12	E	10 4	12	29	8	11	12	12	28	53	11	7
ix. 10.	13	F	10 0	13	m	8	11	34	13	29	53	11	28
xvij. 17.	14	G	9 56	14	1	8	11	55	14	m	53	11	49
vj. 3.	15	A	9 52	15	2	8	12	15	15	1	53	12	11
	16	B	9 48	16	3	8	12	36	16	2	54	12	31
8. xiiij.	17	C	9 44	17	4	8	12	57	17	3	54	12	52
	18	D	9 40	18	5	8	13	17	18	4	54	13	11
iiij.	19	E	9 36	19	6	9	13	37	19	5	54	13	32
	20	F	9 32	20	7	9	13	57	20	6	54	13	52
6. xj.	21	G	9 28	21	8	9	14	16	21	7	55	14	12
xix. 8.	22	A	9 24	22	9	10	14	36	22	8	55	14	31
	23	B	9 20	23	10	10	14	55	23	9	55	14	50
7. viij.	24	C	9 17	24	11	10	15	14	24	10	56	15	10
xvj. 2.	25	D	9 14	25	12	11	15	33	25	11	56	15	28
	26	E	9 10	26	13	11	15	51	26	12	56	15	47
4. v.	27	F	9 7	27	14	12	16	9	27	13	57	16	5
	28	G	9 4	28	15	12	16	27	28	14	57	16	23
11. xiiij.	29	A	9 0	29	16	13	16	45	29	15	58	16	41
2. ij.	30	B	8 56	30	17	13	17	2	30	16	58	16	58
x. ii.	31	C	8 52	31	18	14	17	19	31	17	59	17	15

South Declination.

October.
of the Sunne.

☉ in = third yere.		☉ in = Leap yere.	
D. M.	D. M.	D. M.	D. M.
1	17 41	6 58	1 18 27
2	18 41	7 21	2 19 26
3	19 41	7 44	3 20 26
4	20 40	8 6	4 21 26
5	21 40	8 28	5 22 25
6	22 40	8 51	6 23 25
7	23 39	9 13	7 24 25
8	24 39	9 35	8 25 25
9	25 39	9 57	9 26 25
10	26 39	10 19	10 27 24
11	27 39	10 41	11 28 24
12	28 39	11 2	12 29 24
13	29 39	11 23	13 30 24
14	30 39	11 44	14 1 24
15	1 39	12 5	15 2 24
16	2 39	12 26	16 3 25
17	3 39	12 47	17 4 25
18	4 39	13 6	18 5 25
19	5 39	13 27	19 6 25
20	6 40	13 47	20 7 25
21	7 40	14 7	21 8 26
22	8 40	14 25	22 9 26
23	9 41	14 46	23 10 26
24	10 41	15 5	24 11 26
25	11 41	15 24	25 12 27
26	12 42	15 42	26 13 27
27	13 42	16 0	27 14 28
28	14 43	16 19	28 15 29
29	15 43	16 36	29 16 29
30	16 44	16 54	30 17 30
31	17 44	17 11	31 18 30

South Declination.

At the knees of Cassiopeia, is a starre of the third bignes, distant from the Pole, 31. degr. 50. minutes, right ascention 1. houre.

10

In her lippe is a Starre of the third bignes, distant 31. degr. 26. minutes, right ascention 32. minutes.

11

The backe of her Chaire, of the third bignes, distant 33. degrees 2. minutes, right ascention 23. houres 48. minutes.

12

The great Beares thigh of the second bignes, distant from the Pole, 34. degrees 3. minutes, right ascention 11. houres 32. minutes.

Nouember hath 30. dayes.

The Prime			Leng. of the day	True place and Declination										
				H. M.	☉ in m First yeare.		☉ in m secōdyere							
					D. M.	D. M.	D. M.	D. M.						
	1	D	All Sain.	8 49	1	19	14	17	36	1	18	59	17	32
5. xviiij.	2	E		8 46	2	20	15	17	52	2	20	0	17	48
vij. 3.	3	F		8 43	3	21	16	18	8	3	21	1	18	5
	4	G		8 40	4	22	16	18	24	4	22	2	18	20
11. xv.	5	A	Poud. tr	8 37	5	23	17	18	40	5	23	2	18	36
	6	B	Leonar.	8 34	6	24	18	18	55	6	24	3	18	51
5. iiij.	7	C		8 31	7	25	19	19	10	7	25	4	19	6
	8	D		8 28	8	26	19	19	24	8	26	5	19	21
11. xij.	9	E		8 25	9	27	20	19	38	9	27	5	19	35
j. 12.	10	F		8 22	10	28	21	19	52	10	28	6	19	48
	11	G	S. Mart.	8 19	11	29	22	20	5	11	29	7	20	2
2. ix.	12	A		8 16	12	7	23	20	18	12	7	8	20	15
xvij. 4.	13	B		8 13	13	1	24	20	31	13	1	9	20	28
8. vj.	14	C		8 10	14	2	25	20	43	14	2	10	20	40
xiiij. 8.	15	D		8 7	15	3	26	20	55	15	3	11	20	52
	16	E		8 4	16	4	27	21	6	16	4	12	21	4
	17	F	Hugh.	8 2	17	5	28	21	17	17	5	13	21	15
5. iiij.	18	G		8 0	18	6	29	21	28	18	6	14	21	26
xj. 9.	19	A		7 57	19	7	30	21	38	19	7	15	21	36
	20	B	Edmon.	7 54	20	8	31	21	48	20	8	16	21	46
4. xix.	21	C		7 51	21	9	32	21	58	21	9	17	21	55
viiij. 5.	22	D	Cicily	7 49	22	10	33	22	7	22	10	18	22	4
	23	E	Clemen.	7 47	23	11	34	22	15	23	11	19	22	13
11. xvj.	24	F		7 45	24	12	35	22	23	24	12	20	22	21
	25	G	Kather.	7 43	25	13	37	22	31	25	13	22	22	29
10. v.	26	A		7 40	26	14	38	22	38	26	14	23	22	36
xiiij. 8.	27	B		7 38	27	15	39	22	45	27	15	24	22	43
	28	C		7 37	28	16	40	22	51	28	16	25	22	50
ij. 12.	29	D	Fast	7 36	29	17	41	22	57	29	17	26	22	56
2. x.	30	E	Andrew	7 35	30	18	43	23	3	30	18	27	23	1

South Declination.

Nouember.
of the Sunne.

☉ in m third yere.			☉ in m Leap yere.						
D.	M.	D. M.	D.	M.	D. M.				
1	18	45	17	28	1	19	31	17	40
2	19	46	17	44	2	20	31	17	57
3	20	46	18	1	3	21	32	18	13
4	21	47	18	17	4	22	33	18	28
5	22	48	18	32	5	23	34	18	44
6	23	48	18	47	6	24	34	18	59
7	24	49	19	2	7	25	35	19	13
8	25	50	19	17	8	26	36	19	28
9	26	51	19	31	9	27	37	19	42
10	27	52	19	45	10	28	38	19	56
11	28	52	19	59	11	29	39	20	9
12	29	53	20	12	12	7	40	20	22
13	7	54	20	25	13	1	41	20	34
14	1	55	20	37	14	2	42	20	46
15	2	56	20	49	15	3	42	20	58
16	3	57	21	1	16	4	43	21	9
17	4	58	21	12	17	5	44	21	20
18	5	59	21	23	18	6	45	21	31
19	7	0	21	33	19	7	46	21	41
20	8	1	21	43	20	8	47	21	51
21	9	2	21	53	21	9	49	22	0
22	10	3	22	2	22	10	50	22	9
23	11	4	22	11	23	11	51	22	17
24	12	6	22	19	24	12	52	22	25
25	13	7	22	27	25	13	53	22	33
26	14	8	22	35	26	14	54	22	40
27	15	9	22	42	27	15	55	22	47
28	16	10	22	48	28	16	56	22	53
29	17	11	22	54	29	17	57	22	59
30	18	13	23	0	30	18	58	23	4

South Declination



Certaine Starres neere
vnto the South Pole, with
their distance from the
said Pole, and right
Ascention.

1

The southermost starre in
the South triangle, is a star
of the third bignes, distant
from the South Pole, 11. de-
gr. 30. minutes, right ascen-
tion 9. houres.

2

The Southermost of the
Crossiers, is a starre of the se-
cond bignes, distant 17. de-
grées 30. minutes, right as-
cention 12. minutes.

3

In the Northwest angle of
the South triangle, is a star
of the second bignes, distant
from the Pole, 27. degrees
25. minutes, right ascention
8. houres 4. minutes.

December hath 31. dayes.

The Prime			Leng. of the day H. M.	True place and Declination							
				☉ in 7 First yeare.		☉ in 7 secōd yere.					
				D. M.	D. M.	D. M.	D. M.				
xviiij. 5.	1	F	7 34	19	44	23	8	19	29	23	6
	2	G	7 33	20	45	23	12	20	30	23	11
9. vij.	3	A	7 32	21	46	23	16	21	31	23	15
xv. 4.	4	B	7 31	22	47	23	20	22	33	23	19
	5	C	7 30	23	48	23	23	23	34	23	22
	6	D	7 30	24	50	23	25	24	35	23	25
10. iiij.	7	E	7 30	25	51	23	28	25	36	23	27
xij. 7.	8	F	7 30	26	52	23	29	26	38	23	29
	9	G	7 30	27	54	23	30	27	39	23	30
2. j.	10	A	7 30	28	55	23	31	28	40	23	31
ix. 7.	11	B	7 30	29	56	23	31	29	42	23	31
xvij. 15	12	C	7 30	29	57	23	31	29	43	23	31
vj. 9.	13	D	7 30	1	59	23	31	1	44	23	31
	14	E	7 31	3	0	23	29	2	45	23	30
xiiij. 3.	15	F	7 32	4	2	23	28	3	47	23	28
	16	G	7 33	5	3	23	26	4	48	23	26
iiij. 11.	17	A	7 34	6	4	23	23	5	49	23	24
	18	B	7 35	7	6	23	20	6	51	23	21
xj.	19	C	7 36	8	7	23	17	7	52	23	17
xix. 8.	20	D	7 37	9	8	23	13	8	53	23	14
	21	E	7 38	10	10	23	8	9	55	23	9
8. viij.	22	F	7 39	11	11	23	3	10	56	23	4
xvj. 3.	23	G	7 40	12	12	22	58	11	57	22	59
	24	A	7 41	13	14	22	52	12	58	22	53
v. 10.	25	B	7 42	14	15	22	46	14	0	22	47
	26	C	7 43	15	16	22	39	15	2	22	40
xiiij. 3.	27	D	7 44	16	18	22	32	16	3	22	33
ij. 1.	28	E	7 46	17	19	22	24	17	4	22	26
x. 9.	29	F	7 48	18	20	22	16	18	6	22	18
	30	G	7 49	19	22	22	7	19	7	22	9
7. xviiij.	31	A	7 50	20	23	21	58	20	8	21	1

South Declination.

December.

of the Sunne.

☉ in 7 third yeare

☉ in 7 Leap yere.

☉ in 7 third yeare				☉ in 7 Leap yere.					
D.	M.	D.	M.	D.	M.	D.	M.		
1	19	14	23	5	1	20	0	23	9
2	20	15	23	10	2	21	2	23	13
3	21	16	23	14	3	22	3	23	17
4	22	18	23	18	4	23	4	23	21
5	23	19	23	21	5	24	6	23	24
6	24	20	23	24	6	25	7	23	26
7	25	22	23	27	7	26	8	23	28
8	26	23	23	29	8	27	9	23	30
9	27	24	23	30	9	28	11	23	31
10	28	26	23	31	10	29	12	23	31
11	29	27	23	31	11	30	13	23	31
12	30	28	23	31	12	1	15	23	31
13	1	30	23	31	13	2	16	23	30
14	2	31	23	30	14	3	17	23	29
15	3	32	23	29	15	4	19	23	27
16	4	34	23	27	16	5	20	23	25
17	5	35	23	24	17	6	21	23	22
18	6	36	23	22	18	7	23	23	19
19	7	38	23	18	19	8	24	23	15
20	8	39	23	14	20	9	25	23	11
21	9	40	23	10	21	10	27	23	7
22	10	42	23	6	22	11	28	23	2
23	11	43	23	0	23	12	29	22	56
24	12	44	22	55	24	13	31	22	50
25	13	46	22	49	25	14	32	22	44
26	14	47	22	42	26	15	33	22	37
27	15	48	22	35	27	16	34	22	30
28	16	50	22	28	28	17	36	22	22
29	17	51	22	20	29	18	37	22	14
30	18	52	22	12	30	19	38	22	5
31	19	53	22	3	31	20	40	21	56

South Declination.

4

The foresote of the Centaur of the second bignes, distant 29. degrees 54. minutes right ascention 14. houres 44. minutes.

5

Centaurus thigh of the second bignes, distant 40. degrees 30. minutes right ascention 11. houres 52. minutes.

6

Canopus in argo nauis, of the first bignes, distant from the South Pole 38. degrees 10. minutes, right ascention 6. houres 20. min.

7

The last of Eridanus, of the first bignes, distant 50. degrees right ascention 3. houres.

How to vse these Starres, for the time of their beeing vpon the Meridian, and consequently to finde the height of the Pole or Latitude by them, followes afterward.

☉ 4

This

The Sea-mans Kalender.

	♈		♉		♊	
	D.	M.	D.	M.	D.	M.
0	0	0	11	30	20	12
1	0	24	11	51	20	25
2	0	48	12	12	20	37
3	1	12	12	33	20	49
4	1	35	12	53	21	0
5	2	0	13	13	21	11
6	2	23	13	33	21	22
7	2	47	13	53	21	33
8	3	11	14	13	21	42
9	3	35	14	32	21	51
10	3	58	14	51	22	0
11	4	22	15	10	22	9
12	4	45	15	28	22	17
13	5	9	15	47	22	25
14	5	32	16	5	22	32
15	5	55	16	23	22	39
16	6	19	16	40	22	46
17	6	42	16	57	22	52
18	7	5	17	14	22	57
19	7	28	17	31	23	3
20	7	50	17	47	23	7
21	8	13	18	3	23	12
22	8	35	18	19	23	15
23	8	58	18	34	23	19
24	9	20	18	49	23	22
25	9	42	19	4	23	24
26	10	4	19	18	23	26
27	10	26	19	32	23	28
28	10	47	19	46	23	29
29	11	9	19	59	23	30
30	11	30	20	12	33	30
	♌		♍		♎	
	♏		♐		♑	

This Table sheweth the Declination of the Sunne upon euery seuerall degree of the Ecliptick through all the foure quarters of the Zodiacke: by which Table you may make tryall of the former Table of Declination, if you doubt of any part thereof, as followeth:

First by the Kalender or Ephemerides next before, finde out the day of the Month, for which you desire the Declination, and right against the same you shall haue the signe, degree and minute, which the Sunne possesseth in the Zodiacke the day aforesaid, with which signe and degree, enter this Table and marke whether your signe be at the head of the Table, or at the foote thereof, for if the signe be at the head, then you must count the degree thereof downward, in the first Coloune at the left hand of the Table: but if the signe be at the foote of the Table, you must count the degree thereof upward, in the first Coloune on the right hand: and in the common angle, where the Characters of the signe and degree thereof meetes, is the degree and minutes of Declination desired.

Example.

The 12. of Aprill 1622. the place of the Sunne is 2. degrees of Taurus. I finde Taurus in the head of the Table, therefore counting 2. degrees thereof downward

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downward in the first Colunne on the left hand, right against 2. in the Colunne where Taurus stands, is 12. degrees 12. minutes, which is the declination of 2. degrees of Taurus, or of the Sunne, being in so many degrees of the same signe. But if the place of the Sunne haue odde minutes therewith, you must take the difference of the two nearest degrees of Declination, and worke by the proportionall partes of 60. minutes to a Degree.

As for Example.

The 22. of August 1623. the true place of the Sunne is 8. degrees 27. minutes of Virgo, I finde Virgo to be in the foote of the Table, therefore in the first Colunne on the right hand, I count upwards 8. degrees, and right against the same in the Colunne where the Character of Virgo is, I finde 8. degrees 35. minutes, which is the Declination of 8. degrees of Virgo, but now there is the declination of 27. minutes to be either added or deducted, as the declination doth increase or decrease. To finde which, I take the difference betwixt 8. degrees, 35. minutes, the declination of 8. degrees of Virgo and 8. 13. minutes, the declination of 9. degrees of Virgo, which is 22. minutes. Then I say, if 60. min. giue 22. minutes, what giues 27. min. facit 10. minutes nearest: which because the Declination doth decrease, I deduct 10. minutes from 8. 35. minutes, and the remainder is 8. deg. 25. minutes, for the true Declination of 8. degrees 27. minutes of Virgo.

Againe, the 16. of Aprill, 1624. the true place of the Sunne is 6. degrees 38. minutes of Taurus, I finde Taurus in the head of the Table, then counting 6. degrees downward in the first Colunne on the left hand, right against the same vnder Taurus is 13. 33. min. for the Declination of 6. degrees of Taurus: then for the 38. minutes, I take the difference betwixt 13. 33. minutes, and 13. 53. min. the declination of 7. degr. of Taurus: which is 20. min. then I say, if 60. giue 20. what giues 38. facit 13. minutes, nearest which 13. min. I adde to 13. 33. minutes, because the Declination doth increase and it makes 13. 46. minutes for the true Declination of 6. 38. minutes of Taurus. These three examples (to the ingenious) are as good as five hundred.

The

The diuision, partes, order, and explanation of the former Almanacke or Ephemerides.

The first Page of the said Ephemerides containes an Almanacke for 24. yeares to come, shewing the Prime, Epact, Sunday letter, Leape yeare, with all the principall moueable Feastes in the whole yeare. Next followes the 12. monthes of the yeare in order, each month containing two faces, which 2. faces may be deuided into 3. principall sections: the first common, the second and third Astronomicall: the first being indeed the common, because it is most needfull for all persons, consisteth of five Columnes or spaces: the first space whereof sheweth the day and houre of the Moones change for 19. yeares to come: the second sheweth the number of the dayes in euery Month: the third, the Letters ordinary for euery day of the weeke: the fourth, the Holidajes and other dayes of note in each month. Where note, that those that are obserued for holy dayes, haue this word Fast before them, and the first or last of the said first section, sheweth the length of the day in houres and minutes, where the Pole is eleuated 51. degrees 40. minutes.

The second section containeth 4. principall parts, each part consisting of 3. Columnes, the 4. partes being 4. seuerall yeares, each fourth yeare being Leape yeare, therein comprising the variety of the Sunnes course through the Zodiacke in the said 4. yeares. And the 3. spaces or Columnes in each yeare, the first is the dayes of each month in the said yeare: the second the true place of the Sunne answerable thereto, the third, the Declination or distance of the Sunne from the Equinoctiall pointes of Aries and Libra, toward the tropicall points of Cancer and Capricorne, answerable to each day of the month, and to the degree and minutes of the Sunne in the Zodiacke.

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The reason wherefore the said Table is made for foure yeares, and neither more nor lesse, is, because that euery yeare is not of like equality of dayes one with another: for the first yeare hath 365. dayes & neere 6. houres: the second and third yeares being so likewise, but in the fourth yeare the odde houres are vnted together, which being 4. times 6. is 24. houres very neare, making a naturall day, which day is added to the said fourth yeare, whereby the said fourth yeare is called Leape yeare, because it hath one day more then the primary or foregoing yeares.

And so this Table being made for 4. yeares, would serue for a long time, were it not that the said fourth yeare is not iust 366. dayes, but wants 20. min. or the $\frac{1}{3}$. of an houre, for if there were a iust equality made of the dayes of the yeares, with the progresse of the Sun through the Zodiacke, then this table would serue for a long time without correction: but onely the Zodiacke, with the whole eight Spheare hath a certaine retrograde motion or going backward, yet so vn sensible, that these Tables being gathered and calculated out of the best & truest Ephemerides for the yeares 1621. 1622. 1623. 1624. according to the true place and daily motion of the Sunne there exactly gathered, I make no question but that they will very well serue for 20. yeares at the least, the difference of the Sunnes place euery 5. yeare is so small, being not much aboue 30. seconds or halfe a minute, which in 20. yeares being 5. Bissextels or Leape yeares, makes 2. minutes 30. seconds: a small matter to make any difference in the Sunnes declination.

Notwithstanding which small errour that can growe in so long a time, I thinke it not amisse for the satisfying of those ingenious spirits, which desire perfection in their worke, to adde this one rule for their further satisfaction, that after these foure yeares are past, for which the said former Tables are exactly and truly calculated, to know precisely the true place of the Sunne, for any other 4. yeares afterward, doe thus: subtract 1620. from the date of the yeare in which you would knowe the true place of the Sun, the remainder whereof deuided by 4. that which remaines vpon the said deuision, shewes which of the 4. yeares in the former Kalender serueth to shew the Sunnes place for the
yeare

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yeare proposed, and if nothing remaine after the Division, then the last of the yeares being the fourth in number, is your yeare desired: which knowne, to make an equation of the Sunnes true place, marke how many Unities are in your quotient, for so many minutes must be added to the Sunnes place in the said yeare formerly found for every day in the monthes of May, June, July, August, September, and October, and halfe of so many minutes in the other monthes.

As for Example.

I would knowe the true place of the Sunne the 15. of August, in the yeare 1626. first I substract 1620. from 1626. and there rests 6. which deuided by 4. brings 1. in the quotient, and 2. remaines, which 2. shewes that the second of the 4. yeares, answers to the yeare desired, and being that there is 1. in the quotient, therefore I must adde 1. minute to the place of the Sunne, which is belonging to the day and yeare aforesaid, which being that to the 15. of August in the second of the yeares, belongs 1. degree 55. minutes of Virgo, I adde 1. minute thereto, and the whole 1. degree 56. minutes is the true place of the Sunne for the day and yeare aforesaid, whose Declination answerable thereto, you shall finde right against the same in the next Colu[m]ne towards the right hand to be 10. degrees 51. minutes.

Againe, the 15. of March in the yeare 1625. I desire the true place of the Sun, therefore substracting 1620. from 1625. rests 5. which diuided by 4. the quotient is 1. and the remainer is 1. which remainer being 1. I must seeke for the Sunnes place in the first of the 4. yeares, whose place there I finde for the 15. of March, to be 5. degrees 6. minutes of Aries: to which, because the quotient is 1. I adde halfe thereof, which being 30'. makes 5. degr. 6. min. and 30". for the Sunnes true place the 15. of March 1625. whose declination answerable thereto, you shall finde right against the same in the next Colu[m]ne towards the right hand, to be 2. degrees 2. minutes northerly:

Wherein thus much is to be noted, that albeit, that in the true place of the Sunne there may be in that time so much difference,
yet

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yet in the Declination thereof there can be no sensible difference, for we see, that 3. minutes more or lesse in the true place of the Sunne doth not produce aboue a minute difference of Declination, when the Sunnes Declination is swiftest, which is neare vnto the Equinoctiall point, and being neere vnto the Tropickes, when the Declination doth increase or decrease very slowly three or foure minutes difference in the Sunnes true place, doth not make any difference in the Declination at all: And therefore by that reason you may be well assured, that these Tables being exactly calculated for the yeares aforesaid, will serue you for a very long time without any sensible error.

The third section being the last of the second face, containeth the names, Magnitudes, and Declinations of 54. notable fixed Starres, with their right ascention in houres and minutes, most commodious to finde the eleuation of the Pole, whose vse followeth afterward.

Propositions to bee wrought by the Ephemerides or Sea-mans Kalender, as followeth.

To know the Moones Change.

I.

TO know the day and houre of Coniunction or Change of the Moone, first looke in the first Page of this Ephemerides, right against the yeare of our Lord, for the Prime number, seruing to that yeare: which number keeping in memory, turne to the month in which you desire the Change of the Moone, and in the first Colonne of the said Month vnder the title Prime, looke for the Prime number which you kept in memory, which Prime numbers are there all in numerall Letters, and right against the said Prime number in the next Colonne, is the number of the day of the Month on which the Moone changes: and if there be any figure
with

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With the Prime number, marke whether it be before or after the said Prime number, for if it be before, it sheweth the Moone to change so many houres before none: if after, it sheweth so many houres after none: but if there be no figures at all with the Prime number, then the Moone changes iust at none.

As for Example.

In the yeare 1623. I would know in June upon what day and houre of the saide Month the Moone changes: In the first Page being an Almanacke of 24. yeares: for the Prime, Epact, Dominicall Letter, and moueable Feasts, I finde the Prime for that yeare to be 9. which keeping in memory I turne to June, and in the first Colunne thereof vnder the title Prime, among the numerall Letters I seeke for ix. which I finde right against the 17. day of the Month, thus ix. with the figure of 9. after it, which sheweth that in June 1623. the Moone changes the 17. day, 9. houres after none, which is at 9. a clocke in the euening.

Again, in September the same yeare, the Prime ix. vnder the title Prime in the month of September I find the Prime aforesaid right against the 14. day of the month, with the figure 2. before it, and further against it in the third Colunne, among the Letters for the dayes of the weeke, is the letter E. which by reason that E. is the Dominicall or Sunday letter for that yeare, E. stands for Sunday: so then I conclude, that in September 1623. the Moone shall change the 14. day being Sunday 9. houres before none.

Of the Full and quarters of the Moone.

2.

The next thing to be considered herein, is the first quarter, the full Moone, and the last quarter thereof, which is thus done: to the time of her Change adde 7. dayes and 6. houres, sheweth the first quarter, that doubled shewes the opposition or full: and thereto againe the said 7. dayes, 6. houres added, makes the time of the last quarter.

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To know what Signe the Moone is in.

3.

A third thing needfull to be knowne, is in what signe the Moone is at all times, which may thus be done: vpon the change day next befoze your day required, looke in the second section of the Ephemerides vnder the yeare desired, and the Columne of the place of the Sunne foze the day and yeare, what signe and degree thereof the Sunne was in vpon the said day of the Coniunction, foze then were the Sunne and Moone both in one signe and degree: and to know what signe she is in any day after, multiply her age by 12. which is the meane motion of the Moone: and from the day of the coniunction, in the Columne of the true place of the Sunne, tell fozward, if the number be so great, out of that month to the next, till you haue tolde the number of the product of the Moones age, multiplied by 12. and where the said product number ends, is the signe and degree of the Moone.

Example.

The 16. of October 1623. I desire the same: in which month by the first proposition, I finde the Moone to change the 13. day at 10. a clocke after noone: vnder the title third yeare, shewing the true place and declination of the Sunne foze the said yeare: in the first Columne thereof I seeke the said 13. day of the month, and right against it in the next Columne is 29. degrees 39. minutes of Libra, in which signe and degree both the Sunne and the Moone were at the coniunction: then counting from the change to the 16. day is 3. dayes foze the Moones age, that multiply by 12. is 36. which counting from the day of the Coniunction along in the Columne of the Sunnes place, ends vpon the 18. day of the Month of Nouember, against which day is 5. degrees 49. minutes of 7: therefore I conclude the Moone to be in Sagitarius the day, month and yeare aforesaid: otherwise if you multiply the Moones age by 2. and deuide the product by 5. the quotient shewes the whole signe, and the remainder so many times 6. degrees, as the Moone is gone from that place of the Zodiack where she was in the Coniunction.

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The Moones coming to the Meridian, with the time of
her rising and setting.

4.

Multiply the Moones age by 12. and divide the Product by 15. the quotient sheweth the houre of the Moones being South, and if any thing remaine after the diuision, for euery vnitie that remaines adde 4. minutes, because 15. degrees make an houre of time, and 4. minutes a degree. What knowns, learne by the third proposition what signe the Moone is in, and then looke out in the second section what time and day of the yeare the Sunne possesseth the same Signe and Degree thereof, and right against the said day in the last Columbe of the first section, vnder the title length of the day, is the length of the day, the Sunne being in the same signe in houres and minutes halfe that number of the dayes length taken from the time of the Moones being South, sheweth her rising, and the said halfe added to the time of her being South, sheweth her setting.

Example.

The 16. of October 1623. by the first proposition, I finde the Moone to change that Month, the 13. day afternoone and the number of dayes betwixt that and the 16. aforesaid is 3. for the Moones age, therefore multiplying (her age) by 12. her meane motion, the product is 36. which diuided by 15. (the degrees answering to an houre) the quotient is 2. houres, and 6. remaines, which is so many times 4. minutes: so I conclude the Moone to be vpon the Meridian the day aforesaid, at 2. of the clocke and 24. minutes. Then by the third proposition, I finde the Moone to be that day in about 6. degrees of Sagitarius, the Sun being in which place, is aboue the Horizon 8. houres: which is likewise the time of the Moones continuance aboue the Horizon at that time, or at any time being of like age, and in the same Signe: therefore taking halfe 8. houres which is 4. houres, from 8. a clocke, the time of the Moones being South, there rests 4. houres for the time of her rising. Likewise adding foure houres to eight houres
maketh

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maketh at 12. after noone, for the time of her setting. Thus you see that the day and yeare aforesaid, the Moone shall here in our Horizon, rise at 4. a clocke after noone: she shall be South, or upon the Meridian, at 8. a clocke after noone: she shall set at 12. a clocke at night: and her continuance about the Horizon, or her shining to vs, is 8. houres.

This is a very necessary thing to be knowne, for by her being upon any other point of the Compass, you may giue a very neare guesse, at euery houre of the night.

The next thing to be considered in the first section, is the Feastiuall dayes, and other dayes of note, which are so common, that they neede no explanation. Onely this: before euery feast which is kept Holiday, is set this word Fast.

To know the length of the Day, or the length of
the Night, with the rising and setting
of the Sunne.

5.

All this is performed by the last Colu^{5.}me of the first section, thus: Right against the day of the month desired in the last Colu^{5.}me of the said first section, vnder the Title Length of the day, is the length of the day desired, in houres and minutes: which number subtracted from 24. the length of a naturall Day, leaues the length of the Night: and halfe the said number taken from noone, leaues the houre of the Sunnes rising: the other halfe of the day added to noone, sheweth the Sunnes setting.

Example.

The 19. of October in the yeare 1623. vnder the Title Length of the day, right against the said 19. day, is 9. houres 36. minutes, the length of the day: which 9. hou. 36. min. taken from 24. houres, leaues 14. hou. 24. minuts for the length of the night. Then the halfe of 9. houres 36. minutes, which is 4. houres 48. minutes taken from noone, leaues 7. houres 12. min. for the Sun rising. The same 4. houres 48. minutes added to noone, makes 16. houres 48. minutes, which is 4. houres 48. min. after noone:

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By which you see that the 19. of October, the length of the day, is 9. houres 36. min. the length of the night 14. houres 24. minutes: the Sunne riseth 12. minutes after 7. in the morning, and setteth 48. min. after 4. in the Evening.

Thus much for the first section: the second section being foure parts, seruing for foure severall yeares, every part having three Columns: the first the day of the Month, the second the true place of the Sunne, and the third the Declination of the Sun agreeing thereto, all the three partes being of like quality, which are so plaine and commonly knowne, that they neede no further distinction, albeit that the uses thereof are manifold, and commodities excellent: For there are few propositions concerning the Sphære, which can be wrought without the true place of the Sunne knowne, and being so much use for it, there are as few meanes for the true knowledge thereof, but onely by the Ephemerides, which every one cannot haue.

And for that cause I haue transferred the true place of the Sun in degrees and minutes, out of the best Ephemerides into this Kalender, where it is ready for such as desire the same, or as haue occasion to use the same, in working conclusions, or making of Instruments Mathematicall: but most chiefly I haue here placed it, to the end that those that stand in doubt of the truth of these Tables of the Sunnes declination, may at their owne pleasure make tryall thereof: The order how to doe the same is set downe in the first printed page, after the said Tables, for by the true place of the Sunne, is found his Declination, either North or South: and by his Declination, and obseruation of the Sunnes Altitude upon the Meridian, is knowne the height of the Pole or Latitude of the place where you are.

How to use the Sunnes Declination, thereby to finde out
the Eleuation of the Pole.

6.

To finde out the Altitude or height of the Poles, in any severall Latitude, viz. How much the Pole is raised above your Horizon in degrees and minutes, It is necessary first to take by obseruati

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observation, the Meridian Altitude of the Sunne : which Meridian Altitude is knowne, by taking the height of the Sunne, that day, in which you would obserue, iust at Noone : at which time the Sunne is highest, being then also vpon the Meridian : which found, note it downe in paper or slate : When knowing the yeare of our Lord, with the Month in which you are, and also the day of the month, looke in the Kalender before spoken of, for the Month and Day thereof, and right against the said day of the month, toward the right hand, vnder the Title Declination of the Sunne, you shall see the severall yeares, which the said Tables of Declination serue for. If it be Leape yeare, looke in the last of the said foure Tables, vnder the Title Leape yeare : If it bee the first yeare after the Leape yeare, then resort to the first of the said Tables vnder the Title First : and so of the Second and Third, and after those foure yeares are past, come backe againe to the first, and proceed as you did before : Then (as I said) hauing found out the Month, Day, and yeare, direct your eye downward toward the foote of the Table, in that Table which serues to the yeare proposed, till you find a number making a right angle, with the day of your month : or moze plainely, Looke what number in the last Colu[m]ne of your yeare, is right against the day of your month : which numbers are the Declination for the day desired : and being two numbers in the said colu[m]ne, the first are Degrees, the other Minutes : then regard also, whether the Sunne hath North declination or South declination, which is set downe betwene the severall spaces : where by the way you shall note, that from the Sunns entrance into Aries, which is the 11. of March, till his entrance into Libra, the 13. of September, hee hath North Declination : and from the said 13. of September till his entrance into Aries againe, South declination : the said declination increasing according to the Sunnes progresse through the signes, from his entrance into Aries, till his entrance into Cancer : and decreasing from Cancer to the beginning of Libra. Then againe increasing from Libra to Capricorne, and decreasing from Capricorne to the end of Pisces, and beginning of Aries. Aries, Taurus, Gemini, Cancer, Leo, and Virgo, being Signes hauing North declination

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nation from the Equinoctiall Circle : and Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces, South signes, hauing south Declination from the said Circle : then knowing (as I haue said) the Meridian Altitude of the Sunne, the Declination of the Sun, and whether the Sunne hath South or North declination, as these three thinges are alwayes to be considered, in knowing the height of the Pole. If the Declination be North, substract the declination from the Meridian Altitude, the remainder is the eleuation of the interfection, or cutting of the Equinoctiall with the Meridian aboue the Horizon, which in common termes is the eleuation of the Equinoctiall aboue the Horizon : which height of the Equinoctiall, taken from 90. leaueth the height of the Pole, or the Latitude of the place of your obseruation. But contrariwise, if the Sunne hath South declination, adde the said Declination to the meridian Altitude, the product is the height of the Equinoctiall, which likewise taken from 90. leaueth also the height of the Pole.

Example.

I obserued the 11. of July, 1620. in the City of London, and found the Meridian Altitude of the Sunne to be 58. degrees 56. minutes, and the Declination of the Sunne north 20. degrees 28. minutes: Being that the Declination was North, I substracted 20. deg. 28. minutes, the Declination of the Sunne from 58. degrees 56. minutes, the height of the Sunne at noone : the remainder was 38. degr. 28. min. the height of the Equinoctiall: that taken from 90. leaues 51. degrees 32. minutes, for the height of the Pole, or Latitude of London.

This rule is to be vnderstood, when you are betweene the Equinoctiall and the North Pole, and the Sunne to the southward of you: But if you should be betweene the Equinoctiall and the South Pole, and the Sun north from you, then you must worke contrary: for then, if the Sunne hath South Declination, you must substract the Declination from the Meridian altitude, and if the Sunne hath North Declination, you must adde the said Declination to the Meridian Altitude.

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For Example.

Being at Sea to the Southwards of the Line, the 4. of January, 1620. suppose that you observe the height of the Sunne at none, and finde it to be 66. degrees 20. minutes, then you shall finde the declination to be 21. degrees 25. minutes, to the Southwards, which substracted from 66. degrees 20. minutes, the Meridian Altitude, leaues 44. degr. 55. minutes, for the height of the Equinotiall: that taken from 90. rests 45. degr. 5. minutes, for the height of the South aboue the Horizon.

Againe, suppose that being at Sea, the 10. of May, 1620. and observing the Sunne, you take his Altitude at none 60. degrees 30. minutes, and his Declination then is 20. degr. 6. min. Northward, but then not having obserued long before, you know not whether you are to the Northward of the Equinotiall, or to the southward off the said Line: to know which, set the Sun by your Compass, and marke which way the shadow of the Sun streeketh: for if he casteth his shadow the same way that his Declination is, then is the Sun betwixt the Equinotiall and you. Your selfe being also the same way that the Sunnes declination is: and therefore substracting the Declination 20. degrees 6. minutes, from 60. degrees 30. minutes the Meridian Altitude: rests 40. degrees 24. min. the height of the Equinotiall: the complement whereof 49. degr. 36. minutes is the eleuation of the North Pole: but if the Sunne casts his shadow contrary to his Declination, that is to say: If having North declination, his shadow goeth Southwards, or having South declination, casts his shadow Northward: Then either the Equinotiall shall be betwixt you and the Sunne, or you in the Equinotiall: or else you shall be betwixt the Equinotiall and the Sunne: which to know, adds the Declination and the Meridian Altitude for the day proposed together, If the summe of the addition be lesse then 90. degrees, so much as it wanteth of 90. degr. shall you be distant from the Equinotiall, that way which the shadow streeketh: If it be iust 90. degr. then are you vnder the Equinotiall. Againe, if your said Meridian Altitude and Declination added, passeth 90. degr. then so much as is ouer-plus, shall you be from the Equinotiall towards the

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Sunne, and then also you shall be betwixt the Equinoctiall and the Sunne, and if you finde the Sun to be in your Zenith, so much as is the Declination shall you be from the Equinoctiall, that way that the Sun declineth: By which reason, if the Sun be in your Zenith, that is 90. degrees high, and hath no declination, then are you vnder the Equinoctiall.

How to appropriate the Tables of Declination to any other Meridian.

There is in the vsing of the Sunnes declination, one principall thing to be considered: which is, That a Table of Declination made for any particular place, doth not serue generally for all places, but onely for such places as haue the like, or nere the same Longitude: The reason is, because that the Declination is calculated according to the true place of the Sunne at noone, at which time the Sunne is vpon the Meridian of that place for which the said Tables are made: But you must note that the Sunne doth not come to the Meridian in all places at a like time, although that in all places the Sunne being vpon the Meridian, makes the middle of the day. But for euery 15. degrees difference of Longitude betwæne any two places, the Sunne comes sooner or later to the Meridian, by so many houres: For if the place be 15. degrees to the Eastward of the place preferred, then the Sun comes sooner to the Meridian by an houre, and if it be 15. deg. to the Westward, later by an houre. And so consequently more or lesse, according to the difference of Longitude. By which reason, in what part of the world soeuer you be, you may worke for the Declination of the Sun in that place, by the proportionall parts of 24. houres Declination, to the houre of difference in Longitude.

As for Example.

Being in Brasilia (a part of the West Indies) the 10. of Aprill, this yeare 1620. whose Meridian is distant from the Meridian of England, to the Westward about 45. deg. which is 3. hou. of time, that the Sunne should come to the Meridian later there then here at London where the Table is made: For when it is 12. a clocke here, it is but 9. there, and being noone there, it is 3. a clocke here.

Therefore

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Therefore to apply this Table to that place, I finde the Declination for the day aforesaid, vnder our Meridian to be 11. degr. 43 min. at none, and by reason that when it is 12. a clocke at Brasilia, it is then at London 3. houres past, Therefore by the rule of proportion, I seeke what declination the Sun hath at 3. a clocke after none, as followeth. I take the difference of Declination between the day aforesaid, and the next following, which is 20. min. then I say by the rule of 3. if 24. houres giue 20. minutes, what giues 3. houres, the time of the difference of Longitude? facit 2. min. and 30. seconds, which (because the Declination increases) I adde to the number of the day proposed: so I conclude the declination of the Sunne to be the 10. of Aprill at none, in the Kingdome of Brasilia, 11. degrees 45. minutes and $\frac{1}{2}$.

Againe, the day and time aforesaid, in the Bay of S. Sebastian. whose Longitude is 58. degrees to the Eastward of London, answering nere to 4. houres of time, shewing that the Sunne comes sooner to the Meridian in the Bay of St. Sebastian, by 4. houres then at London: by which reason the Declination is lesse there, then at London, because the Declination doth increase: For if the Declination did decrease, it would be moze there then at London: and to know the declination of the Sunne in the Bay aforesaid: I take the difference betwixt the Declination of the 10. of Aprill, and the Declination of the day next before, being 20. min. Then (I say) if 24. houres giues 20. min. what 4. houres? facit 3. min: which deducted from 11. degr. 43. minutes, the declination of the Sunne the 10. of Aprill aforesaid at London, leaueth 11. degr. 40. minutes: The declination of the Sunne at none, in the Bay of S. Sebastian, being that when it is 12. of the clocke there, it is but 8. a clocke at London: or in any place hauing the same Longitude.

How to obserue the height of the Pole by
the Starres.

The working hereof by the Starres, to finde the height of the Pole, is all alike with the working thereof by the Sunne: for if you obserue any Starre vpon the Meridian, looke in the third

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or last section of the Ephemerides, amongst the monthes for the name of the Starre which you obserued, wherewith you shall finde his Declination either North or South, and the right ascension thereof in houres and minutes: and hauing taken the Altitude of any Starre vpon the Meridian, you haue nothing to make in the Table for this but the Declination, which if it be North, take the Declination of the Starre from the height thereof: The remainder taken from 90. leaueth the height of the Pole: but if the Starre hath South declination, adde the declination with the Altitude taken, and the Product thereof taken from 90. leaues the height of the Pole: Also to finde the time of any Starres comming to the Meridian, is set downe after the Table of the Sunnes right ascension.

Example.

The 25. of Nouember 1621. I obserued a Starre of the second bignesse in the shoulder of Pegalus, or the Flying-horse, about 8. of the clocke in the Euening, and found the Meridian Altitude thereof to be 51. degrees 26. minutes: and in the Kalender, in the second Face thereof, I finde the said Starre to haue 12. degrees, 58. min. North declination: which taken from 51. degree 26. min. the height obserued leaues 38. degr. 28. minutes the height of the Equinoctiall: the complement whereof 51. degr. 32. minutes, is the height of the North Pole at London.

And so consequently for all those Starres, whose Declination is taken from the Equinoctiall: but for those Starres which are any thing neare to the Pole, whose distance or Declination is counted from the Pole, their working is thus: You must note, that being any thing farre to the Northward, some of those Stars will be twice vpon the Meridian, viz. once aboue the Pole, and once vnder the Pole: Therefore if you obserue any Starre vpon the Meridian vnder the Pole, adde the distance of the said Starre from the Pole to your Altitude obserued, the totall is the height of the Pole: But if you obserue any Starre vpon the Meridian aboue the Pole, so much as is the distance or Declination of the said Starre from the Pole, you must take from the Altitude taken, the remainder is the height of the Pole.

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As for Example.

If at London you obserue the former Guard Starre beneath the Pole vpon the Meridian, you shall finde it to be 37. degrees 21. minutes, to which if you adde 14. degrees 11. minutes, the distance of the said Starre from the Pole, the totall is 51. degrees 32. minutes the height of the North Pole at London. Again, the same Starre obserued vpon the Meridian aboue the Pole is 65. degrees 43. minutes, from which 14. degrees 11. minutes, the distance aforesaid taken, leaueth 51. degrees 32. minutes as befoze.

Note that being farre Northward, those starres betwene the Equinoctiall and the Tropicke of Cancer, are best to obserue, and being betwene the said Tropicke and the Equinoctiall, those Starres about the Pole are fittest for obseruation, and for those that trauaile farre beyond the line to the Southwards: the like order must be kept by the Starres, betwene the Equinoctiall and the Tropicke of Capricornus, and those that are neare the South Pole.

And whereas the North-Starre it selfe being very neare vnto the Pole, is the fittest Starre for to be obserued, by reason of the nearenesse thereto, I haue for your further ease, made an exact Table for the declination of the North Starre from the Diameter of the Poles Circle, described by the North Starre, which may be also, or rather called the Elevation or depression vpon euery point of the Compasse, being very commodious, by reason whereas the other Starres are onely to be obserued vpon the Meridian, This said North Starre by the helpe of this Table following, may be obserued at any time of the night, whose vse followeth after the said Table.

This

The Sea-mans Kalender.

	Pointes of the Com- passe.		D egrees	M inutes	Of Decl ination.
	N. W.b.W.		0	0	
	North west.		0	34	
	N.W.by N.		1	6	
	N.N.W.		1	36	
	N by W.		2	4	
	North.		2	24	
If the guards be	N.by E.	Then the Load star is	2	40	Under the Pole.
	N.N.E.		2	50	
	N.E.by N.		2	52	
	North East.		2	50	
	N.E.by E.		2	40	
	E.N.E.		2	24	
	E.by N.		2	4	
	East.		1	37	
	E.by S.		1	6	
	E.S.E.		0	34	
	S.E.by E.		0	0	
	South East.		0	34	
	S.E.by S.		1	6	
	S.S.E.		1	36	
	S.by E.		2	4	
	South.		2	24	
If the gaurds be	S.by W.	Then the Load star is	2	40	Aboue the Pole
	S.S.W.		2	50	
	S.W.by S.		2	52	
	South west.		2	50	
	S.W.by W.		2	40	
	W.S.W.		2	24	
	W.by S.		2	4	
	West.		1	36	
	W.by N.		1	6	
	W.N.W.		0	34	

This former Table shew-
eth how much the
North starre is, either
aboue or beneath the
Pole, the Guards be-
ing vpon any point of
the Compasse.

The vse of which ta-
ble is thus: hauing
obserued the Altitude of
the North starre, marke
so neere as you may, by
on what point of the
Compasse the Guards
then are: which known,
resort to this Table, and
finding therein the said
point vpon which the
Guards were at your ob-
seruation, right against
the same is the number
of degrees and minutes,
which the starre is ei-
ther aboue or beneath
the Pole, which number
so found, if it be aboue
the Pole must be sub-
tracted from your Alti-
tude taken, and if vnder
the Pole, it must be ad-
ded to the said Altitude
taken: which totall ad-
ded, or remainer substra-
cted, is the true height of
the Pole it selfe.

As

The Sea-mans Kalender.

As for Example.

Observing the North Starre to be 58. degrees 30. min. when the Guards are at the North-east, I looke in the Table for the North-east point of the Compasse, and right against the same I finde 2. degrees 50. minutes under the Pole, which being that the North Starre is under the Pole, I adde his Declination 2. degrees 50. minutes, to 58. degr. 30. minutes his Altitude obserued, and the totall 61. degrees 20. minutes, is the iust height of the Pole it selfe in that place.

Againe, obseruing the North Starre to be 50. degrees 15. min. aboue the Horizon, when the Guards are vpon the Southeast point of the Compasse, I looke for Southeast in the Table, and right against the same is 34. minutes aboue the Pole, which being that the Starre is then so much higher then the Pole it selfe, I subtract 34. minutes, the Declination of the Starre from 50. deg. 15. minutes the Altitude taken, and the remainer 49. degrees 41. min. is the perfitt height of the Pole aboue the Horizon in the said place of obseruation.

And now hauing made plaine vnto you, the vse and profite of the said Table, it being indeed so necessary and commodious for the Mariners vse, as any rule whatsoeuer, it resteth now to speake somewhat more particularly of the other fixed Starres, set downe in the former Kalender, or Ephemerides, whose vse is manifold and very excellent, but their vse for the finding of the Poles elevation by their Declination, obserued at their being vpon the Meridian, being formerly shewed, it is onely requisite to explaine vnto you, a briefe and easie methode for the exact and ready finding of the true time of any of the said fixed Starres comming to the Meridian, at which time they are onely fit for to be obserued: for the knowledge whereof, I haue here placed a Table of the right ascention of the Sunne for every day of each month throughout the whole yeare, according to his true place for euery of the said dayes, formerly set downe in the Kalender or Ephemerides: the vse whereof followeth after the said Table.

A Table

A Table of the Sunnes

Dayes	Ianua.	Febru.	March	Aprill.	May.	Jun
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1	19 30	21 39	23 25	1 16	3 11	5 15
2	34	43	28	20	15	19
3	39	47	32	25	19	23
4	43	50	36	29	23	27
5	47	54	40	33	27	31
6	52	58	44	36	30	36
7	56	22 2	47	40	34	40
8	20 0	6	51	43	38	45
9	4	9	55	47	42	49
10	8	14	58	51	46	53
11	13	18	0 2	55	50	57
12	17	21	6	58	54	6 1
13	22	25	9	2 2	58	5
14	26	29	12	6	4 2	9
15	30	32	16	10	7	13
16	34	36	20	14	11	18
17	38	40	23	18	15	22
18	42	44	27	22	19	26
19	46	48	31	26	23	30
20	50	52	35	30	27	34
21	54	56	38	33	31	38
22	58	59	42	37	35	42
23	21 3	23 3	46	41	39	46
24	7	7	49	44	43	51
25	11	10	53	48	47	55
26	15	14	57	52	51	59
27	19	18	1 0	56	56	7 3
28	23	22	3	3 0	5 0	7
29	27		7	4	3	11
30	31		11	7	4	15
31	35		15		11	

right ascension in Houres and Minutes.

Dayes	July.	Augu.	Septē.	Octo.	Nouē.	Decē.
	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
1	7 19	9 22	11 16	13 5	15 5	17 12
2	23	26	20	8	9	17
3	27	30	23	12	13	21
4	31	33	27	16	17	25
5	35	36	30	19	21	30
6	40	40	33	23	25	34
7	44	44	37	27	29	39
8	48	48	41	31	33	43
9	52	52	44	34	37	47
10	56	56	48	38	42	52
11	8 0	59	52	42	46	56
12	4	10 3	55	45	50	18 0
13	8	7	59	49	54	5
14	12	11	12 3	53	58	10
15	16	15	7	57	16 3	14
16	20	18	11	14 1	7	18
17	24	22	14	5	11	23
18	28	26	18	9	16	27
19	31	29	22	13	20	32
20	35	33	25	17	24	36
21	39	36	29	20	28	41
22	43	40	32	24	33	45
23	47	44	36	28	37	50
24	51	47	40	32	41	55
25	55	51	43	36	46	59
26	59	54	47	40	50	19 3
27	9 3	58	51	44	55	7
28	7	11 2	54	48	59	12
29	11	6	58	53	17 3	16
30	15	9	13 2	57	8	21
31	19	13		15 1		25



A Declaration of the former
Table.

Thinke it not amisse, befoze I shew the vse of the former Table of right ascention, for the finding of the time of any Starres coming to the Meridian, to explaine vnto you what wee call right Ascention. Knowe therefore, that in the Spheare there is right ascention, oblique ascention, and meane ascention, which haue all severall definitions: but the rest being impertinent, I will onely speake of right ascention, which is thus defined: Right ascention is that portion of the Equinoctiall which commeth to the Meridian, or some sted with any Starre, or any part of the Eclipticke: or more plainly, it is that number of degrees of the Equinoctiall, comprised betwixt the Vernal equinoctiall point, or interfection of the said Equinoctiall Circle, and the first minute of Aries, and that Starre or part of the Eclipticke, which is vpon the Meridian at the day or time desired. As for your better vnderstanding, if the beginning of Aries bee vpon the Meridian, or any point or Starre in the said beginning of Aries, then hath the said point or Starre so situated, no right ascention at all, by reason that the beginning of the Equinoctiall commeth to the Meridian therewith: But if the beginning of Cancer, or any Starre in that situation, be vpon the Meridian, then is there with it vnder the same Meridian 90. degrees of the Equinoctiall, or 6. houres of time, being that euey 15. degrees of the Equinoctiall answers to one houre of time, shewing that that Starre or point, which is in the beginning of Aries, shall come to the Meridian 6. houres sooner then

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then that other which is in the beginning of Cancer, and so of others: I doubt not but that these few words will suffice to give you the better light to that which followes. First therefore to finde the right ascention of the Sunne at any time, looke for the Month in the head of the Table, and for the day of the Month at the left side of that face, where the month desired is, and in the common Angle answering to them both, is the houre and minute of the Sunnes right ascention.

As for Example.

I desire the right ascention of the Sun the 25. of May: first in the head of the Table I looke for May, which found in the first Coluime on the left hand, I looke for 25. and right against the same in the common Angle, vnder the title May, I finde 4. houres and 47. min. for the right ascention of the Sun, the said 25. of May.

These thinges thus knowne and considered, it is to be noted, that whereas the Sunne hath a different number for his right ascention euery day, and the Starres keepe euery one still alike number for his peculiar right ascention, the reason thereof is this:

The Starres are all fixed in the eight Spheare, in which eight Spheare is also the Zodiacke placed, not onely to limit the course and progresse of the Sunne in his continuall motion, but also to giue a certaine limitation to the Starres, who being fixed in any part of the Heauens, that certaine Meridian or Circle of South and North, which passeth through the Center of any starre, cutteth also in one place or other of the said Zodiack: which number of degrees so cut in the Zodiacke, is the Longitude or distance of the said starre from the beginning of Aries: Now the starre (as I said) being so fixed hath no motion, but onely as the whole frame of the Zodiacke with the eight Spheare, and all the Circles and Starres therein placed, which as is apparant to the sight, is by the first mouer carryed round about from East to West in 24. houres: but the naturall motion of the said eight Spheare, being from the West to the East, is so slowe, that it is vnsensible: whereas the Sunne being of a very swift motion in comparison of the former, his motion being euery 24. houres, nere vpon a
Degree

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Degree little more or lesse, makes his motion from the West to the East in the Zodiack most apparant by his motion, also describing the Zodiacke Circle, as neuer declining from the middle thereof: And further, the Sunne being the ruler of the Day, and director of the Night, is the sole and onely distinguisher of Time: For this is apparant to the view of euery one, that the Sun being vpon the Meridian aboue the Horizon, makes the middle of the day, and being vpon the Meridian vnder the Horizon, makes also the middle of the night: which being (as I haue said) that the Sunne comes alwayes to the Meridian iust at 12. a clocke, it folloves necessarily, that what Starre or point in the Zodiacke soeuer, hath greater Longitude then the Sunne, his right ascension is also greater then the Sunnes: and looke how much the said right ascension is more then the Sunnes, by so much later then the Sunne must the said Starre or point come to the said Meridian, proportionally after 15. degrees to an houre, and one degree to 4. minutes of time.

Take this therefore for a generall rule, that if the right ascension of the Starre, whose time of coming to the Meridian you desire to know, be greater then the right ascension of the Sunne, subtract the Sunnes right ascension from the said Starres right ascension, and the remainder (if it be lesse then 12.) is the houre and minute that the Starre comes to the Meridian after noone: and if the remainder be more then 12. subtract 12. also, and the remainder shoves so many houres and minutes after midnight: But if the Sunnes right ascension be greater then the Starres right ascension, then adde 24. houres to the Starres right ascension, and subtract the Sunnes right ascension there from, as before, the remainder shoves the Starres coming to the Meridian after noone: If it be lesse then 12. or if it be more then 12. twelue also subtracted, the remainder shoves so many houres and minutes after midnight.

As for Example.

The 15. of Nouember, I desire to know at what time Oculus Tauri (or the Bulls eye) will be vpon the Meridian: First in the former Table of the Sunnes right ascension, I looke for the 15. of
Nouem

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November, where I finde the Sunnes right ascention for that day to be 16. houres and 3. minutes: and in the Kalender or Ephemerides among the fixed Starres, I finde the right ascention of the Bulles eye to be 4. houres 13. minutes: which being lesse then the Sunnes right ascention, I adde 24. houres to 4. houres 13. minutes, and from the totall 28. houres 13. minutes: subtracting 16. houres 3. minutes the Sunnes right ascention, rests 12. houres 10. min. which being more then 12. houres, I take away also 12. houres, and so there rests 10. min. after midnight, that Oculis Tauri comes to the Meridian the said 15. of November.

Againe, the 10. of Aprill, I would know at what time the Lyons taylor will be upon the Meridian: in this Table I finde the Sunnes right ascention, the day aforesaid, to be one houre 51. minutes, and in the Kalender I finde the right ascention of the Lyons taylor to be 11. houres 29. minutes: Then subtracting 1. houre 51. minutes, the Sunnes right ascention, from 11. houres 29. minutes the Starres right ascention, rests 9. houres 38. minutes, shewing that 38. minutes after 9. a clocke at night, the said starre shall be upon the Meridian.

The Monthly time of each Starres being in rule for Obseruation.

January.

Oculus Tauri, the whole constellation of Oryon, Hyrcus the Goate, the great Dog, the little Dog, the greatest part of Leo, the Crofiers, Canopus, and the South Tryangle.

February.

The whole constellation of Leo, Arcturus, the Centaure, and the Virgins Spike.

March.

The hinder part of Leo, Hydra, Virgins Spike, the Centaur, Arcturus, the Ballance, and Scorpio.

Aprill.

The Centaure, Ballance, Scorpio, Lyra, and Sagitarius.

Ⓔ

May.

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May.

Scorpio, Lyra, South crowne, and Eagles heart.

June.

South Crowne, Eagles heart, Swans tayle, and the Dolphin.

Iuly.

The Dolphin, Fomahand, and Pegafus shoulder.

August.

Fomahand, Pegafus, Cassiopeia, Andromeda, the Whale, and the Kamme.

September.

Cassiopeia, Andromeda, the Whale, the Kamme, Medusa, Perseus, and Eridanus.

October.

All the former of September, and October, Oculus Tauri, Orion, Hircus, and the great Dog, the Crosiers, and Canopus.

Nouember.

All the former of October, with Nouember, the little Dog, and the South Triangle.

December.

The Whale, the Kamme, Medusa, Perseus, Eridanus, Oculus Tauri, Hircus, Orion, Canopus, great Dog, little Dog, Hydra, and Leo, in the Monthes aforesaid, at one time or other of the Night, these Starres are vpon the Meridian.

Having sufficiently explained vnto you the manner and way how both by the Sunne and Starres to attaine to the true height of the Pole, or Latitude of any place: I purpose now God willing to speake somewhat of the Longitude: which as the former is most easie, and the finding thereof known almost to all Sea-men, so is the other as vncertaine, and hath not yet hitherto beens found out or knowne exactly to any, albeit that many Learned men and of great experience, haue laboured very earnestly for the same, and many good meanes haue they inuented, as helpes and assistance vnto Marriners in their long Nauigations and Trauels, by which, though with great labour, care and industry, they transport themselues to the vtmost Regions of the world, with farre more ease and facility they might doe it, if they could as perfectly

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perfectly and readily finde the Longitude at all times, as they may the Latitude: for then hauing sayled many dayes in vnknowne pathes vpon the large and spacious Seas, and induring all those vn-indurable troubles, miseries, and vnspeakeable calamities, which doe for the most part attend vpon Long-voyages: yet after all this, if vpon the first faire opportunity, they could readily with the Latitude, finde also the Longitude, their forepassed troubles would be ioyfully remedied, being that these two (like louing sisters) would apply much pleasing comfort to their colde stomackes, after their tedious trauels, by giuing them the true p^ricke or place of their then present being. Peter Appian, and Gemma Frisius, hath written thereof, as also some others: but truely in my opinion, it was neuer brought to such exquisite perfection, as it is now a dayes: and for me to write thereof, were but as it were to set vp a Candle at noone dayes, rather to shew mine owne folly, then to lighten those that know a better way then my selfe: in which doing, well may Apelles saying, Ne sutor vltra crepidam, be applyed vnto me: But for my excuse I doe intreat the iudicious to perswade themselves, that it is far from my thought to set downe any thing in this for a president vnto them, but onely in good will to shew my opinion thereof, to the Ignorant, being as followeth.

First therefore, the Latitude being knowne: by finding the Longitude also, you haue the true p^ricke or place in the Globe, or Carde, where your Ship is, which to finde neerest, is two wayes, one by dead Reckoning, the other by Obseruation: But dead Reckoning (as they call it) being as I take it most v^sed, I will speake first thereof, by which if it were possible that this reckoning could exactly and precisely be kept, it would giue both Latitude and Longitude without any obseruation at all: The different Latitude being onely the distance that the Ship is departed from the Pararell where shee last was, either Northward or Southward: and Longitude being the distance that shee is departed from the Meridian, either Eastward or Westward: For the knowledge whereof, these things are principally to be considered.

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First, the true p^ricke or place of the Ships being at the beginning of the Voyage.

Secondly, a sound and experimented iudgement of the way that the Ship maketh, with euery shift of winde.

Thirdly, to know exactly how much the Compasse doth vary from the true North or South point, vpon which the Needle is toucht, either Eastward or Westward, in as many severall places as conueniently may be obserued.

Fourthly, to note diligently the Floods or Currents, which may cause the Ships way to be more Leeward, or otherwise then expectation, and to giue allowance of her course and way accordingly.

Fiftly, the severall points of the Compasse that she makes her course good vpon, and what way she hath made vpon euery point.

Sixtly, to bring those severall courses into one straight line, thereby to know what course she hath made good, with the nearest distance vpon the said point or Rombe, that she hath made her way good vpon.

And lastly, knowing how many leagues doth raise or lay a degree vpon the said Rombe, the true reckoning of your said course and distance, giues you the difference of Latitude or the Paralell where the Ship then is: and also knowing how many leagues answer to a degree of east and west in the said paralell, the course, distance and Latit. giues the difference of Longitude or the Meridian, vnder which the Ship then is: the interfection of which said paralell and Meridian, is the p^ricke or place of the ships then being, of which thinges I will speake more particularly afterward.

Now it resteth to speake something of knowing the Longitude anely by obseruation, which is very necessary to be knowne, that thereby the one may make tryall of the other, being that if the account by dead reckoning, and also by obseruation doe both agree in the Latitude and Longitude, then may you be well assured, that you know truely the place where you then are, which Longitude by obseruation is thus knowne: prepare a very perfect and true running glasse, which may precisely runne 24. houres without error, and about the time that you purpose to set sayls, set the said glasse

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glasse a running iust at twelue a clocke, when the Sunne is vpon the Meridian: and being run out, be sure to turne the said glasse instantly as it is out, not losing any time in the turning of it, and so hauing very warily kept the said Glasse till you thinke good to make an obseruation, at which time it is requisite to haue in readinesse a halfe houre-glasse, and a minute-glasse, that if the 24. houre-glasse be out before the Sunne come to the Meridian, then so soone as it is out, to turne the halfe houre-glasse or min. glasse, as you see occasion, thereby to know presently how much the 24. houre-glasse is out before the Sunne comes to the Meridian: for if the Sunne is vpon the Meridian iust when the 24. houre-glasse is out, then you may assure your selfe that you haue sayled North or South, and are still vnder the same Meridian that you were at at the first: but if the 24. houre-glasse bee out before the Sunne come to the Meridian, for euery foure minutes that the glasse is out before noone, your difference of Longitude is 1. degree to the westward, and for euery houre 15. degrees. And contrary, if the Sunne come to the Meridian before the glasse is out, then according to the same proportion of time, is your difference of Longitude to the Eastward, which difference of Longitude, if you multiply by the number of miles answerable to a degree of Longitude in that Latitude where you then finde your selfe to be, the product giues the miles of distance, that you are either to the Eastward or westward of the Meridian, that you departed from.

The like may also be effected by any of those fixed Starres, whose true time of comming to the Meridian you know: For if the accompt of time precisely kept by your glasse, and the starres comming to the Meridian as you finde in your table of right ascension doe iustly agree, then are you still vnder one and the same Meridian, but if the time be past by your accompt, that the said Starre should be vpon the Meridian before the Starre doth come to the Meridian, for euery houre that the starre comes to the Meridian after the said time past, your difference of Longitude is 15. degrees to the Westward, and for euery houre that the starre comes to the Meridian before, by your accompt, of time truly kept, it should be vpon the Meridian, your difference of Longit.

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is 15. degrees to the Eastward. Thus much shall suffice to haue spoken concerning my opinion for finding the Longitude at Sea by obseruation, and now it rests to speake somewhat of some necessary helpes, for the finding thereof by dead reckoning, as is before promised.

Of the variation of the Compasse.

Concerning the Variation of the Compasse, it hath bene very learnedly treated of by diuers of our owne Countrymen, and in our bulgar tongue, and namely by Maister Norman, and Dr. Burrowes, in their Booke called the New Attractive, and Variation of the Compasse: And since that, most excellently and ingeniously written of by that rare and learned Mathematician of our time, Maister Wright, in his Booke of the Correction of errors in Nauigation: as also in his Translation called the Hauen-finding Art: In which respect it is needlesse for me here to write any thing thereof, onely let it suffice to speake a little thereof, as being necessary to the knowlege of the foregoing matter, for them that would willingly note how much the Compasse doth vary in several places of their sayling. I thinke it best to haue the Needles of their Compasses touched vpon a good stone, and so placed directly vnder the North point of the Fly, without allowing any Variation at all, the outer edge of the said Fly to be graduated each quarter into 90. degrees, for the ready reckoning of the degr. that the Compas doth vary from the true North or South, either toward the East or West: ouer which Fly, it is necessary to haue a round Circle of brasse, with two sightes vpon the same, the one directly against the other, at opposite points to be raised perpendicularly where occasion shall serue: which circle, with the sightes thereon, as I haue said, being placed vpon the glasse, ouer the Fly, within the bore, where the Compasse is, when you would obserue the Variation of the Compasse iust, either at the Sun rising or setting, turne the sightes in the brasse circle towards the Sunne, and looking through the same, marke precisely how many degrees, the Sunne riseth or setteth from the East or West point of the Fly or Compasse: For if the Sunne be in the Equinotiall, hauing then no amplitude, so much as is the difference of the Sunnes rising or setting

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Setting from the East or West pointes, shewed by the Compasse, is the variation of the Compasse, from the true North or South: but if the Sun be either to the Northward or Southward of the Equinoctiall, hauing amplitude: then is there a respect also to be had to the Sunnes amplitude: as thus, if the Sunne haue North or South amplitude, and that you obserue the Sunne to rise or set so much from the East or West point of the Compasse, as is the Sunnes amplitude, and likewise the same way that the amplitude is, then hath the Compasse no variation: but if the Sun hauing North amplitude, riseth notwithstanding more northerly by your Compasse, then by the said amplitude it should doe, the degrees or true amplitude, deducted from the amplitude, which the Compasse sheweth, leaueth the variation of the Compasse to be Eastward of the north: but if the true amplitude be greater, then the Compasse sheweth, the one deducted from the other, leaueth the variation to the westward of the North: and if the amplitude be southerly, and the Compasse shew the Sunne to rise northerly, both the differences added together, giues the variation easterly: or if the amplitude be northerly, and the Compasse shewes it to be southerly, then both the differences added together, giues the variation Westerly. All this is to be vnderstood, when you obserue by the Amplitude Ortiue, viz. at the Sunnes rising: for if you obserue the setting thereof, then by adding or deducting the differences betwixt the true amplitude known, and the amplitude giuen by the Compasse, the totall or remaine shewes the Compasse to vary so much to the contrary side: an example will make all this plaine vnto you, which let be thus proposed. Suppose that being at Sea, you finde by the Table of lines hereafter set downe (or by some other meanes) the Sunns amplitude at that time to be 20. degr. to the Northward, and setting the Sun at his rising by the Compasse (as is before shewed) you finde that the Sun riseth 35. degr. to the northward of the East, which is somewhat to the northward of the northeast and by East point, therefore subtracting 20. deg. the Sunns true amplitude, from 35. degr. the Amplit. which the Compasse sheweth, the remaine being 15. degr. sheweth the Compasse to be so much varied from the N. to the Eastward,

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which is 1. whole point, and about 1. third: otherwise the Sunne hauing the same amplitude northerly, (as is aforesaid) and setting him at his going downe by the Compasse, the said Compasse sheweth him to set onely 5. degrees to the Northward of the west, which deducted from 20. degr. the true amplitude leaueth 15. deg. for the variation of the Compasse to the Eastward, as before.

Another Example.

Suppose that the Sunne hauing 23. degrees of South amplitude, and the Compasse sheweth his amplitude or rising to be 11. degrees northerly, add 23. degrees the true amplitude, with 11. degrees of contrary amplitude, which the Compasse sheweth, and the product 34. degrees, being three whole points and somewhat more, sheweth that the Compasse is so much varied from the true North to the Eastward.

Againe, the Sunne hauing the like amplitude Southerly, you obserue at his setting, and finde by your Compasse that he setteth 11. degr. Northerly, adding the two amplitudes as aforesaid, 23. and 11. the product 34. sheweth the variation so much to the westward, being that in the obseruation at his rising, the East and by North pointes of the Compasse, standeth where the East Southeast should be: and at his setting in the other obseruation, the West and by North pointes of the Compasse, pointeth to the Sun, in which place should be the West Southwest pointes.

These few wordes will suffice, being (that albeit to the Ignorant they seeme somewhat darke) yet in the practise thereof, they shall finde it I doubt not, but very plaine and easie for their vnderstanding; otherwise there are sundry sorts of Instruments to finde the variation by, but others hauing already written thereof, I haue thought good also to shew my opinion of this plaine and easie way, knowing that the Marriner hauing made experience of many wayes, will onely vse that which hee findeth best, both for his ease, profite, and truth thereof. And note that whatsoeuer is here spoken concerning the finding of the variation by the Amplitude, the very like may be also obserued by the Azimuth, which by the Sunne or Starres being to be seene, may at any time be knowne.

How

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How many Leagues sayling vpon any point of the Compasse will raise or lay a degree of Latitude, and what difference of Longitude you make therewith.

This is so common in euery Booke, that I neede not to write thereof, but onely being that it is a necessary helpe to that which hath bene before spoken of, it is not amisse to set it heere downe, being as followeth.

First, sayling South or North you keepe still one Meridian: and in sayling 20. English leagues you either raise or depresse the Pole one degree: But if you sayle vpon the first point or Kombe from North or South, either Eastward or Westward, you must sayle 20. Leagues and one third part to raise or lay a degree of Latitude: and hauing so changed your Paralell one degree, you are also departed from your first Meridian 4. leagues that way which your course was.

Upon the second point or Kombe from North or South 21. leagues and one third, raise or lay a degree of Latitude, and your distance from the first Meridian is 8. leagues and one third.

Sayling vpon the third point 24. leagues, raise or lay a degree and distance from the first Meridian, is 13. leagues and one third.

Upon the fourth point 28. leagues and one third, raise or lay a degree of Latitude, and distance from the Meridian, is 20. leagues.

Upon the fift point 36. leagues, raise or lay a degree of Latitude, and distance from the Meridian is 30. leagues.

Sayling vpon the sixt point or Kombe 52. Leagues and one third, raise or lay a degree, and hauing altered your Latitude one degree vpon that point, you are departed from the first Meridian 48. Leagues and one third.

If you sayle vpon the seauenth point, being the next from the East or West, you must sayle 102. Leagues, and 2. thirds, before you raise or lay the Pole one degree, and then are you 101. leagues from your first Meridian, but if you sayle East or West, then are you still in a Paralell, and neither raise nor lay the Pole at all.

To

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To finde the distance betweene any two places, knowing the Longitude and Latitude of them.

If the two places differ onely in Latitude, then are they both under one and the same Meridian: and to know the distance betwixt them in miles or leagues, multiply the number of the degree of difference, by 60. miles, or 20. leag. the product of which multiplication giues the true distance betweene them in miles or leag. according as you worke them, being that 60. miles or 20. leagues make one degree of a great Circle: but if the one place haue north Latitude, and the other South, then adde both their Latitudes together, and worke as aforesaid: and if both the places are under the Equinotiall, then haue they no Latitude: And there likewise 60. miles, or 20. leagues make one degree, and the working is like the former, if the difference be vnder 180. degrees: For if the difference be more then 180. subtract the said difference from 360. and multiply the remainer by 60. or 20. as before.

These are so plaine and easie that they neede no Examples: but if they differ both in Longitude, & Latitude, or in Longitude onely, in any Paralell beside the Equinotiall, the working is somewhat more difficult, by reason that the further the Paralels are distant from the Equinotiall toward either of the Poles, the shorter they are: and the shorter the Paralels are, the fewer minutes or miles make a degree: so that whereas in the Equinotiall 60. minutes or miles make a degree, in that Paralell where the Pole is raised 52. degrees 37. minutes makes 1. degree, viz. one deg. in the Latit. of 52. in running East or West, answers to 37. miles: for which purpose, as also for diuers necessary vses, I haue here added a Table, shewing the miles of distance and minutes of Time, answerable to a degree, in euery severall degr. of Latitude, from the Equinotiall towards either of the Poles: And when you know the miles answerable to a degr. in the Paralell desired, if the difference of the two places be onely in Longitude, multiply the difference of their Longitude by the number of miles answerable to a degree, and the product sheweth the distance in English or Italian miles betwixt the said two places.

Example.

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Example.

London and Middlebrough have both in a manner one Latit. viz. about 52. deg. and I finde in this Table, that in the paralell of 52. 37. miles make a degree of Longitude, the Longit. of London is 25. deg. 50. min. and the Lon. of Middlebrough is 29. deg. 40. min. which subtracted one from another, leaves 3. deg. 50. min. for the difference of Longit. Then multiplying 3. deg. by 37. miles, the product is 111. miles: then for 50. min. I say by the rule of three, if 60. min. give 37. miles, what gives 50. minute: facit neere 31. which added to 111. makes 142. miles, or 47. Leagues, and a mile for the distance betwixt London and Middlebrough.

But if the two places differ both in Longitude and Latitude, then is the working more difficult then either of the former: For first you must take the difference of the 2. places in Longitude. and then their difference also in Latitude. and multiplying the deg. of their difference in Latitude by 60. set the product thereof by it selfe, for the first number: then multiply the difference of Longitude, by the number of miles answerable to each Latit. severally, and add both the products together: the halfe whereof set downs for your second number, and multiplying each of the said 2. numbers into it selfe squarely, add both the products together, and extracting the square roote thereof, the said square roote is the distance betwixt the two places desired.

As for Example.

To goe directly in a right line from Callice in France, to Constantinople in Grecia: I finde by the Tables following, that the Long. of Callice is 29. deg. 10. min. and the Latit. thereof 50. deg. 40. min. Also the Longit. of Constantinople is 61. Degr. 20. min. and the Lat. 44. deg. 40. mi. then subtracting the

Deg. of Latit.	Min. to a Deg.	Deg. of Latit.	Min. to a Deg.
0	60	60	30
10	59	61	29
15	58	62	28
18	57	63	27
21	56	64	26
24	55	65	25
26	54	66	24
28	53	67	23
30	52	68	22
32	51	69	21
34	50	70	20
35	49	71	19
37	48	72	18
38	47	73	17
40	46	74	16
41	45	75	15
42	44	76	14
44	43	77	13
46	42	78	12
47	41	79	11
48	40	80	10
49	39	81	9
51	38	82	8
52	37	83	7
53	36	84	6
54	35	85	5
55	34	86	4
57	33	87	3
58	32	88	2
59	31	89	1

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the lesser Longitude, from the greater, the difference of Longitude is 32. deg. 10. minutes.

Also I take the one Latitude from the other, and there rests 6. deg. for the difference there of, which 6. degrees multiplied by 60. miles, produceth 360. miles for the distance betwixt the paralell of Callice, and the paralell of Constantinople.

Now for the distance betwixt Callice, and the Meridian of Constantinople, I multiply thirty two degrees 10. minutes, the difference of Longitude by 38. the miles answerable to a degree in the paralell of Callice, and the Product is 1222. miles: Then I multiply thirty two degrees 10. minutes, the aforesaid difference of Longitude by 42. the miles answering to a degree in the paralell of Constantinople, which Product being 1351. miles, is the distance betwixt Constantinople, and the Meridian of Callice: These two distances added together make 2573. the halfe whereof, being 1286. is the means distance betwixt the Meridians of the said two places: So haue you two numbers, viz. 360. miles, the distance that the Paralell of Constantinople is to the Southwards of Callice, and 1286. miles, the distance that Constantinople is to the Eastward of the Paralell of Callice: Therefore if you multiply 360. into it selfe, the Product is 129600. and likewise multiplying 1286. into it selfe, the Product is 1653796. which both added together, make 1783396. the square roote of which number is the distance desired: which to helpe those that are not perfitt in extraction of rootes, I haue here set downe the working thereof as followeth

The manner how to extract the square & Cube root of any number is more plainely taught, toward the end of the Booke.

First, I set downe the proposed number with a Quotient, and vnder the last Figure, I put a prick: and so likewise vnder each other Figure toward the left hand, leauing betwixt each prick one Figure vnprickt: So haue I vnder this number, 4. prickes signifying that the roote must consist of foure Figures, and to finde them out, I seeke

Longitude

Latitude

1 2 2 2
1 3 5 1
2 5 7 3
1 2 8 6

1653796
129600

1783396

1783396 | 1

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I seeke what is the greatest square number over the first pricke, which is 1. therefore I put 1. in the quotient for the first figure of the roote, and cancell the figure over the first pricke : then to finde the 2. figure of the roote, I multiply the quotient by 20. which being 1. doth neither multiply nor deuide : therefore I seeke how often 20. is contained in 78. the number of the second pricke, which you must take no oftner then that the square of the said number being added therewith may be likewise taken there from, so I see 3. times 20. being 60. and the square of 3. which is 9. added thereto, is 69. which may be taken there from : therefore I put 3. in the quotient, taking 69. from 78. the number ouer the 2. pricke leaues 933. to the 3. pricke : then for the 3. figure of the roote, I multiply 13. the quotient by 20. the product is 260. which I seeke how often it may be taken out of 933. and I find that 3. times 260. is 780. whereunto the square of 3. being added, makes 789. therefore I put 3. in the quotient and subtracting 789. from 933. rests 14496. for the 4. pricke : then for the last figure of the roote, I multiply 133. the whole quotient already found by 20. and the product is 2660. which may be taken 5. times in 14496. for 5. times 2660. is 13300. vnto which 25. the square of 5. added, makes 13325. therefore I put 5. in the quotient, for the fourth and last figure of the roote : and making my subtraction as afoze, the worke will stand as you see, by which you may know the square roote of the proposed number to bee 1335. and very nere $\frac{7}{8}$. So I conclude the true distance between Callice and Constantinople, to be 1335. miles, and nere halfe a mile. The manner how to extract the roote of any number, is set down more at large after the Tables of lines.

783396	1
x	20
	1
	20
	3
	60
	9
	69
9	13
783396	13
x	20
	260
	3
	780
	9
	789
1	9
844	789
x 783396	133
	133
	20
	789
	2660
	5
	13300
x 11	25
94471	13325
x 783396	1335
x 69	
789	
13325	

The

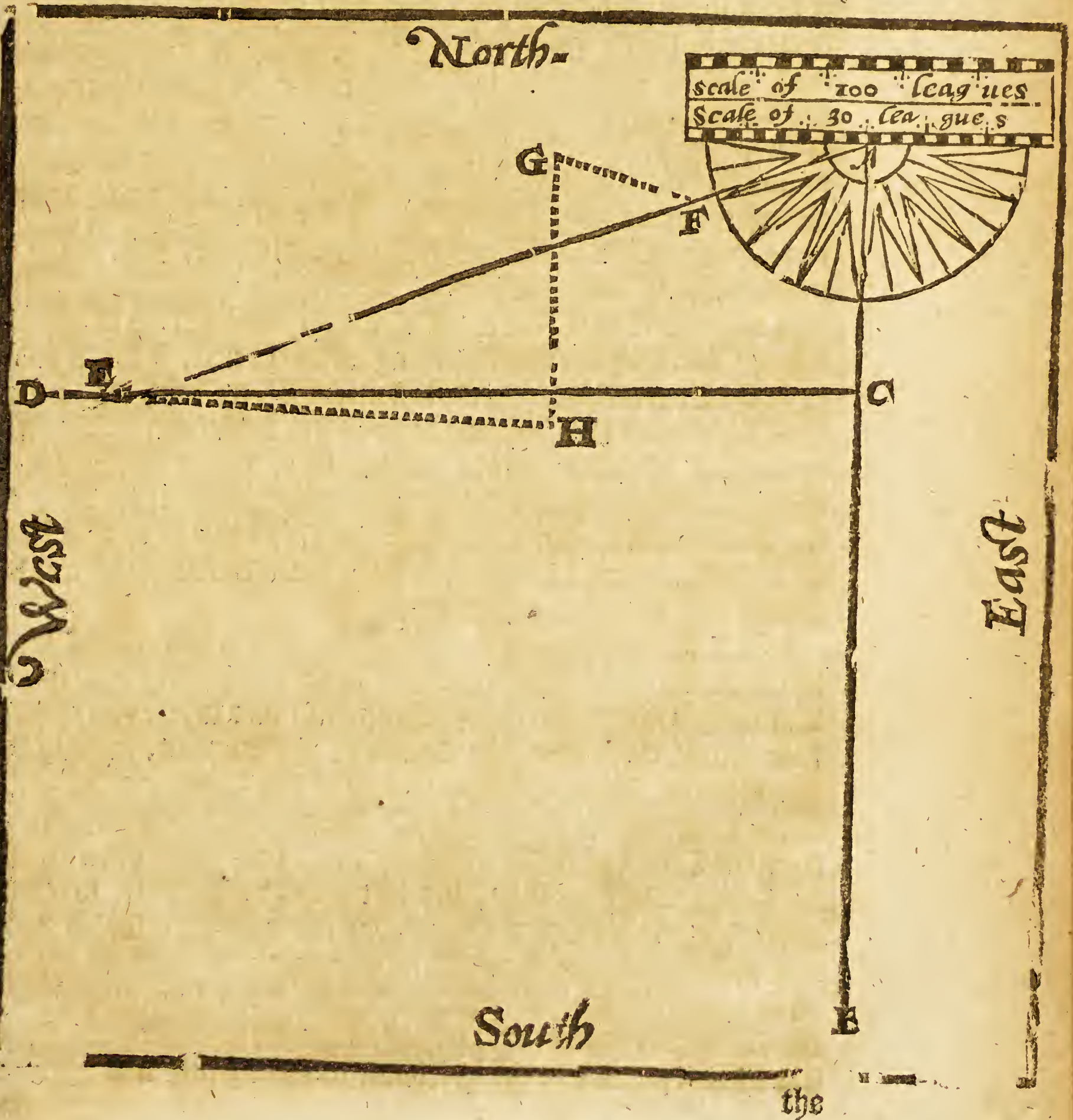
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The ingenious Mariner may sayle by knowing the true Longitude & Latit. of places, to any place assigned, aswell by a blanke of paper or pastboard as by his Sea Card, by the helpe of a Protractor, in this manner: First vpon the board or paper lyned with Meridians and Paralels, or to them that can make a right Angle vpon any pycke or point, a sheete of cleane paper is sufficient to keepe a Trauerse vpon, To know your course from the place where you are, to any other place assigned: as I say vpon your board or paper make a pycke for the place where you then are, and from the said pycke draw a right lyne to represent the Meridian of the same place, then placing the Center of the Protractor vpon the said pycke, lay the North or South point of the Fly or Protractor, as the place beareth vpon the lyne ready drawne. Then by the last Chapter learne the distance of miles betwixt the place where you are, and the Paralell of the place you are bound to: or more briefly, what portion of the Meridian is comprized betwixt the Latitude of the two places, that distance by the scale of the Protractor, apply to the Meridian by you drawne, and where the distance ends, draw another lyne square, or at right angles to the other, either East or West, as the scituation of the place assigned requireth: and by the former Chapter learne the distance betwixt the Meridian by you drawne, and the Meridian of the other place assigned: which knowne (by your Scale) apply that distance to your lyne of East or West, and where that number of distance ends, make another pycke for the true scituation of your place assigned: then laying a thrid or ruler from the Center of the protractor, being the place where you are, and extending it to the other pycke last made, the edge of the ruler or lyne shewes vpon the protractor, the point of the Compasse that the place assigned beares from the place where you are: and the scale applied to the said line or edge of the ruler, shewes the distance: also the distance may be knowne by extracting the square roote, as is befoze shewed: an example of this, and for the vse of the Trauerse-board, and so an end.

A Ship being at the Lizard, in the South-west partes of England, whose Longitude and Latitude I finde in the Table following to be 18. Degrees 30. minutes, and 50. Degr. 10. minutes, is bound

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bound for an Island in the Ocean Sea called Maida, whose Longitude I finde in the same Table to be 2. degrees 40. minutes, and Latitude 46. degr. 40. min. the difference of their Latitude is 3. deg. 30. min. which is 210. miles, or 70. leagues : Therefore from
The Type of a Trauerse boord and a Protractor.



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the prick 02 point A. I draw the line A. B. in the Trauerse-board here adioyning, and vpon the point A. I place the Center of the protractor being one halfe of the Mariners Compasse, the middle point whereof representing the North 02 South (as occasion serues) I lay vpon the line A. B. and applying 70. leagues (whereof of the scale on the edge of the Protractor contains 100) from A. towards B. where the said 70. ends, I make a prick marked with C. so is A. C. 70. leagues, the distance betwene the Lizard and the Paralell of Maida, then from C. I drawe the line C. D. at right angles to A. B. and by the former chapter I finde the distance betwene Maida, and the Meridian of the Lizard to be 629. miles 02 209. Leagues, and 2. miles: which by the scale aforesaid applied to the line C. D. at the end of the said distance, I set a prick marked with E. so is the line C. E. 209. Leagues, the distance that Maida is to the Westward of the Meridian of the Lizard, 02 the line A. B. then the protract lying as at the first, I lay a ruler from the Center thereof, to the last prick E. and with the former scale, measuring along by the edge of the ruler from A. the first prick to E. they last: I finde the distance to be 222. Leagues, and the ruler cuts the point West and by South, and halfe a point to the Southwards: So I conclude the Ile of Maida to be distant from the Lizard 222. leagues, and the direct course West and by South, and halfe a point Southwards.

But if the winds scant 02 be contrary, so that you cannot sayle by the direct course, then must you keepe a reckoning how many leagues you sayle vpon euery other point: and where you change your course, there place the Center of the protract, keeping the Meridian 02 North and South line of the Protractor paralell, to the Meridian drawne on the Trauerse-board, and laying a ruler from the Center of the Protractor, along that point vpon which the Ship maketh her way, and to the edge of the ruler so placed apply so many leagues of the scale, as the Ship hath sayled vpon that point, and then where that number ends, set a prick for the place where the Ship then is, and againe vpon that prick place the Center of the protractor laying as before the South and North line thereof paralell to the Meridian 02 South line first drawne,

and

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and then laying a ruler to the center of Protractor, being the place where the Ship then is, and to the place assigned, it shewes upon the Protractor, the point how they beare, and the scale applyed thereto shewes the distance, as in the former example: Having sayled from the Lizard in the right course 50. leagues, being then in the point F. the winde commeth to another point, so that she maketh her way West and by North 40. leagues: at the end of which course is the letter G. from thence she runneth South 75. leagues: at the end of which course is H. then from H. to know the distance, and what course must be kept to the prefixed place of Maida marked with E. I place the Center of the Protractor upon H. and the edge thereof, which is then North and South parallel or equidistant to the first line A B. which so placed, I lay a ruler from the Center thereof to E. and I finde the course to be West, and halfe a point to the North 125. Leagues.

Note, that it is necessary to haue upon your Protractor two severall Scales, a greater and a lesser, for the greater the scale is you keepe your reckoning by, the truer shall your accompt be.

Necessary Questions of Navigation, with their Answers.

Question. 1.

If I sayle from the Paralell of 50. degrees 70. leagues upon a Southwest course, I demand how much I lay or depresse the Pole, and how many degrees and Leagues, I depart from the Meridian?

Ans. Pole depressed 2. degr. 28. min. difference of Longitude 3. degr. 25. minutes, leagues from the Meridian 49. and $\frac{1}{2}$.

Q. 2. If I sayle from the Paralell of 40. degrees, upon a well Northwest course, untill I raise the Pole 3. degr. 30. minutes, I demand how many leagues I haue sayled: and how many degrees and leagues I haue departed from the Meridian?

A. Leagues sayled 183. difference Longitude 12. degrees 11. minutes, league, from the Meridian 169.

H

Q. 3. From

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Q. 3. From the Paralell of 47. deg. if in sayling 108. leagues between west and North, I raise the Pole 3. deg. I demand upon what Kombe I haue sayled? as also how many degr. and leagues I am from the Meridian, from whence I began that course?

A. A Kombe North west and by west, difference Longitude 6. degr. 36. minutes, leagues from the Meridian 90.

Q. 4. If from the Paralell of 50. degr. I sayle so long betwene North and East, till I raise the Pole 6. degrees, and depart from the Meridian 4. deg. I demand upon what point of the Compasse I haue sayled, and how many leagues I haue runne?

A. The course is neare North northeast, leagues runne 126.

Q. 5. If from the Paralell of 50. degrees I sayle North west, untill I am 4. degr. from the Meridian where I began my course, I demand how many leagues I haue sayled, and how much the Pole is raised?

A. Leagues sayled 70. and 2. thirds, Pole raised 2. degrees, and a halfe.

Q. 6 Two Ships departing from one place in the Paralell of 50. degrees, the one in sayling 145. leagues towards the West, hath raised the Pole 4. degr. and the other hath raised the Pole 7. deg. and is 95. leagues West from the Meridian of the place from whence he began his course: I demand by what course the said Ships haue sayled, how many leagues the two ships haue sayled, how farre they be a sunder, and by what course they may meet?

A. The first Ship that sayled North west and by west: The second hath sayled North west by North 172. leagues, they are a sunder 63. leagues, and the course betwene them is North northeast, and South southwest.

Q. 7 Two Ships departing from one place in the Paralell of 60. degrees, the one in sayling 145. leagues towards the West, hath raised the Pole 4. degr. and the other hath raised the Pole 7. degrees, and is 93. Leagues West from the Meridian of the place from whence he began that course: I demand by what course the said Ships haue sayled the way of the 2. Ships, how farre they be a sunder, and by what course they may meet?

A. The first Ship hath sayled North west and by West, the second

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second hath sayled Northwest and by North 168. leagues, they are a sunder 64. leagues 3. degr. Easterly, course betwene them is North Northeast:

Q. 8 Two ships sayling from one place in the Paracell of 60 deg. the one sayling 180. leagues Eastwards, hath raised the Pole 5. degrees, I demaund upon what course, and how many leagues the other Ship shall sayle to bring himselfe 50. leagues North by West from the first ship, and what they are both departed from their first Meridian?

A. The first Ship hath sayled Northeast and by East, and is departed from the Meridian 146. leagues. The second ship must sayle Northeast 3. degr. northerly, leagues 220. and is departed from the Meridian where he began his course 169. leagues.

Q. 9 If I sayle from the Paracell of 50. degr. 100. leagues North, I demaund what Latitude I am in?

A. In the Latitude of 55. degrees.

Q. 10 If I sayle from the Paracell of 50. degr. South, till I lay the Pole 5. deg. I demaund how many leagues I have sayled?

A. 100. Leagues.

Q. 11 If from Latitude 22. deg. I sayle in the Paracell of 60. deg. 100. leagues East, I demaund what Longitude I am in?

A. In Longitude 32. degrees.

Q. 12 If from Longitude 22. degr. I sayle in the Paracell of 50. degr. to Longitude 10. degrees, I demaund how many leagues I have sayled?

A. Leagues 154. and a quarter.

Q. 13 If I sayle from Longitude 20. deg. and Latitude 40. to Longitude 35. degr. 27. min. and Latitude 30. degrees, I demaund the Course and distance?

A. Course West Southwest, distance 520. Leagues.

Q. 14 From Longit. 22. deg. and Latitude 45. deg. northeast 20. leagues, what Longitude and Latit. hath the second place?

A. Twenty three deg. Longitude 45. degr. 42. min. Latitude.

Q. 15 From Longitude 23. degr. and Latitude 45. degr. 42. minutes East and by North 30. leagues, what Longitude and Latitude hath the second place?

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A. 25. degrees 9. min. Longitude 46. degr. 5. min. Latitude.

Q. 16 From Longitude 25. degrees 9. minutes, and Latitude 45. degrees 59. minutes East Southeast 25. leagues. What Longitude and Latitude hath the second place?

A. 26. degrees 46. min. Longitude, 45. deg. 31. min. Latitude.

Q. 17 From Longitude 26. degrees 53. minutes, and Latitude 45. degrees 31. minutes North 40. leagues. What Longitude and Latitude hath the second place?

A. Longitude 26. deg. 53. min. Latitude 47. deg. 31. minutes.

Q. 18 From Longitude 26. degrees 53. minutes, and Latitude 47. deg. 31. min. 50. leagues West North-west. What Longitude and Latitude hath the second place?

A. Longitude 23. deg. 57. min. Latitude 48. deg. 28. minutes.

Q. 19 From Longitude 23. degrees 57. minutes, and Latitude 48. deg. 28. min. East North-east 60. leagues. What Longitude and Latitude hath the second place?

A. Longitude 28. degrees 27. minutes, Latitude 49. degrees 26. minutes.

Heere followeth a briefe Table of Sines for Arithmaticall Calculation, the totall sine whereof is 10000. with certaine necessary Propositions to be wrought thereby, by which few things proposed, and the Examples thereto annexed, any one that hath either an ingenious Spirit, or a willing minde to the practise of the Mathematicall Sciences, may attaine to much knowledge therein.

A briefe declaration of the same.

What the Table of Sines is, hath bene very Learnedly explained by others, and therefore needlesse is it for me to discourse thereof; onely take these few instructions for the helpe of those, which as yet haue no knowledge therein. First know, that

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that sayling, which is the principall thing here aymed at, is performed by a true and perfect knowledge of the Sphere, by the projection whereof, all Calculations, Tables calculated, and Instruments for obseruation are inuented, protracted, framed and made.

What the Sphere is I neede not to discusse, the chiefe & great Circles thereof consisting of 360. degrees, and one quarter thereof being 90. degrees, which quarter being taken from the whole Circumference, consisteth of these three particulars, viz. An arch or part of a Circle being indeed 90. degr. or a quarter of the whole Circle: a right Angle, and two equall sides thereto, of which the one is the base or ground lyne, the other a perpendicular let fall thereon at right angles, the utmost ends or extentions of which two lines are the limits of the aforesaid arch, or quarter of a Circle: the which three partes so fitted together in their due order, sheweth the perfite platforme of one quarter of the whole Circle, commonly called a Quadrant: the base or ground line whereof being diuided into 10000. equall parts, is Sinus totus or the whole sine: and the whole arch or quarter of a Circle into 90. degrees, is the whole arch belonging to the said whole sine.

Within which Quadrant, any number of degrees or minutes counted from the beginning or first perpendicular, may be called an arch, or part of a circle: and another perpendicular let fall therefrom to the aforesaid base or ground line, the number of equall parts that the said perpendicular falleth vpon, is the right sine to the arch giuen: and the complement of the arch giuen, is the remainder thereof, it being taken from 90. degr. or the whole Quadrant. To finde out the right Sine of any giuen Arch, looke in the head of the Table following for the degrees thereof, and if there be any minutes therewith, looke for the minutes at the left side of the Table, and carrying your eye downward from the degree, till you come right against the minutes, the number which you finde in the common Angle to them both, is the right sine of your giuen Arch desired: as if you desire the Sine of 35. degrees 20. minutes, looke in the head of the Table for 35. and vpon the left side thereof for 20. and in the common square or angle right against them both, you shall finde 5783. which is the sine of 35. degrees

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degrees 20. minutes, and if you substract 35. degrees 20. minutes from 90. degrees, the remainder 54. degrees 40. minutes is the complement thereof, whose right sine (found as before is taught) is 8158. what the versed sine is and how found out, is afterward shewed. I doubt not but that these few wordes will suffice for the explaining of the Table following, whose large and ample uses for Navigation and other the Mathematicall practises these following exemplary Propositions, will in some reasonable sort make manifest: by which few here proposed and answered, the ingenious may gather the manifold uses thereof, being that indeed the benefit to be reaped thereby is great, and the propositions to be wrought thereby infinite. Who so desires more perfection in this kinde of Navigation and generally in all Mathematicall practises, let them spend some time in the study of Pitiscus; of the Doctrine of Triangles, not long since translated and published in our English tongue by Mr. Raph Handson.

Certaine Propositions to be wrought by the Table of Sines.

The Sunnes true place being knowne, to finde his
Declination. Prop. 1.

As the whole Sine is to the sine of the greatest Declination, so is the sine of the Sunnes distance from the nearest Equinoctiall point, to the sine of the Declination for the day proposed.

Example.

I would know the Declination of the Sun the 1. of May, 1622. at what time the true place of the Sun being in 20. deg. 36. min. of Taurus, is 50. deg. 36. min. from the beginning of Aries, or the vernal Equinoctiall point, therefore I must multiply the sine of 50. deg. 36. min. the Suns distance from the Equinoctiall point by the sine of 23. deg. 31. min. the greatest Declinat. and that product must be deuided by the whole sine, whose several sines being found out in the table following, & set in order, the work will stand thus:

—	As	90	give	23.31	what	50.36
		10000		3990		7727

Facit, 3083. whose nearest arch 17.57. min. is the true Declination of the Sunne, the day and yeare aforesaid.

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The Declination of the Sunne giuen to finde his place in the
Zodiacke. Prop. 2.

As the sine of the greatest Declination is to the whole sine, so
is the sine of the Declination for the day proposed to the
Sunnes place or distance from the nearest Equinoctiall point.

Example.

The first of May, 1622. I finde that the declination of the Sun
is 17. degrees 57. minutes North, therefore I say :

If 23.31	giue 90	what	17.57
3990	10000		3083

Facit nearest to 7727. whose arch 50. degrees 36. min. is the
Sunnes distance from the vernal Equinoctiall point of Aries,
from which taking 30. degrees the whole sine of Aries, the remai-
ner 20. degr. 36. minutes, shewes the Sunne to be so much entred
into Taurus, which is the next signe.

The Latitude and Declination of the Sunne giuen,
to finde the Amplitude.

Prop. 3.

As the sine of the Complement of the Latitude is in propor-
tion to the whole sine, so is the sine of the Sunnes declinati-
on to the Amplitude.

Example.

The 10. of Aprill, 1624. I desire the amplitude of the Sunne,
viz. how much the Sun doth rise and set from the true East and
West point of the Horizon, towards the North or South in the
Latitude of 51. deg. 40. min. to know which, the worke is thus.

If 38. degrees 20. minutes, the complement of the Latitude,
giue 90. degrees the arch of the whole sine, what giues 11. degr.
43. min. the Declination of the Sunne :

38. deg. 20. min.	90	what	11. 48. minutes,
6202	10000		2045

Facit 3297. nearest whose arch sought out in the Table of sines,
is 19. degr. 15. min. for the amplitude in the day, yeare and place
proposed: the same deuided by 11. and 1. quarter, the number of
degrees that belongs to a point of the Compasse, sheweth one

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point

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point and 8. degrees, which the Sunne riseth and sets to the Northward of the East and West, being that the Declination is North, for if the Declination were South, then were the Amplitude southerly.

The Declination and Amplitude of the Sunne giuen,
to finde the height of the Pole.

Prop. 4.

As the Sine of the Amplitude is in proportion to the sine of the Declination, so is the whole sine to the sine of the complement of the Latitude.

Example.

The Declination 11. degrees 43. min. and the Amplitude 19. degr. 7. minutes, I demaund the height of the Pole: Say,

If 19. 7.	gives	11. 43	what	90.
3275.		2031.		10000.

Facit, 6202. nearest whose arch in the Table of sines being 38. degrees 20. min. is the height of the Equinoctiall, or the complement of the Latitude: that subtracted from 90. degrees, leaues 51. degrees 40. min. for the height of the Pole or Latitude of the place desired.

The true place and Declination of the Sunne giuen, to finde
the right ascention. Prop. 5.

As the Sine of the Complement of the Declination is to the totall sine, so is the sine of the complement of the Sunnes distance from the beginning of Aries, to the Complement of the right ascention.

Example.

I desire the right ascention of the Sun the 20. of Aprill, 1621. being then in 10. deg. 14. min. of Taurus, at which time his Declination is 14. degrees 56. min. and the complement thereof 75. deg. 4. min. and the distance from the beginning of Aries 40. deg. 14. min. whose complement is 49. degrees 46. minutes I say then,

If 75. 4.	gives	90	what	49. 46. minutes
9663		10000		7634

Facit,

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Facit, 7900. whose arch in the Tables of sines is 52. Degrees 11. minutes, the complement whereof 37. Degrees 49. min. is the Sunnes right ascention: the same conuerted into houres by allowing 15. deg. to an houre, giues 2. houres and 31. minutes.

This is to be vnderstood, when the Sunne is betwixt the beginning of Aries, and the Tropicke of Cancer, for if the Sunne be in the Tropick of Cancer, then is the right ascention 90. degrees or 6. houres: and if the Sunne be betwixt the Tropicke of Cancer, and the Equinoctiall point of Libra, subtract the distance that the Sun is from the beginning of Aries, out of 180. degrees, and with the remainder worke as before for the right ascention, which ascention so found, take from 180. and the remaine is the right ascention desired. But if the Sunne be betwixt the Equinoctiall of Libra, and the Tropick of Capricorne, subtract the said distance from the beginning of Aries, out of 270. degrees, and if betwixt the Tropicke of Capricorne, and the beginning of Aries, take the said distance out of 360. degrees, and then worke as before. One example or two will make all this plaine vnto you.

The last of Iune, 1622. the true place of the Sunne 17. degrees 51. min. of Cancer, is 107. degr. 51. minutes from the beginning of Aries, which taken from 180. leaues 72. degr. 9. min. whose complement is 17. deg. 51. minutes, the Sunnes declination being then 22. deg. 20. min. the complement thereof 67. degrees 40. minutes. Say then,

If 67.40	giue	90	what	17.51. minutes?
9250.		10000.		3026.

Facit, 3314. whose arch is 19. degr. 21. min. the complement whereof 70. degrees 39. min. taken from 180. leaues 109. degr. 21. min. for the right ascention desired, which conuerted into houres, makes 7. houres 16. minutes. Again, I desire the right ascention of 20. degrees 40. minutes of Capricornus, whose distance in continuall proceeding from the beginning of Aries, being 290. degrees 40. minutes taken from 360. leaues 69. deg. 20. minutes, with the complement whereof 20. degr. 40. min. and the complement of the Declination of the Sunne vpon the same point of the Sunnes place 68. deg. 6. minutes, I worke as followeth.

If

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If 68.6. giue 90. what 20.40.
 9278 10000 3529.

Facit 3803. whose arch is 22. degrees 21. minutes, the Complement whereof 67. degr. 39. min. taken from 360. leaues 292. degr. 21. min. for the right ascention desired, the same conuerted into houres, is 19. houres 29. minutes.

The Latitude and Declination of the Sunne knowne, to
 finde the difference ascentionall.

Prop. 6.

As the sine of the complement of the Latitude is to the sine of the Latitude, so is the sine of the Declination to the quotient found: againe, as the sine of the complement of the Declination is to the whole sine, so is the said quotient found to the difference ascentionall.

Example.

I would know the difference ascentionall when the Declination is 20. degrees 6. minutes, and the Latitude 51. degrees 40. minutes, I say,

If 38.20 giue 51.40 what 20.6.
 6202 7844 3437.

Facit 4346. for the quotient found: then againe I say,

If 69.54 giue 90 what
 9361. 10000 4346.

Facit 4627. whose arch in the Table of sines, 27. degrees 34. min. is the difference ascentionall for the day proposed: the same reduced into houres and minutes, makes one houre and 50. minutes, which taken from 6. a clocke, the houre that the Sunne riseth, being in the Equinoctiall, leaueth 4. houres 10. minutes, at what time the Sunne then riseth, and the said ascentionall difference added to 6. a clocke, makes 7. a clocke, 50. minutes, for the Sunne setting.

Again, the said ascentionall difference doubled and added to 12. houres, the time from 6. in the morning till 6. at night, makes 15. houres 40. minutes, for the whole length of the day.

This is when the Sunne hath North declination, for if the declination

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Declination be South, then the ascensionall difference added to 6. a clocke, giues the Sunnes rising, and taken from 6. leaues the setting, and being doubled and taken from 12. houres, leaues the length of the day as aforesaid.

The Amplitude and difference ascensionall of the Sunne or
Starres giuen, to finde the Declination.

Prop. 7.

As the sine of the time of the Sunnes rising, conuerted into degrees and minutes, is to the sine of the complement of the Amplitude, so is the whole sine to the sine of the complement of the Declination.

Example.

The difference ascensionall being 27. degrees 34. minutes, thewes the Sunne to rise at 4. a clocke 10. minutes, which conuerted into degrees makes 62. degrees 30. minutes, and the amplitude being found as befoze is shewed in the third Proposition, is 33. degr. 38. min. and the complement thereof 56. degrees 22. minutes. Say then,

If	62.30	giues	56.22	what	90
	8870		8326		10000.

Facit, 9386. whose arch 69. degrees 50. minutes, the complement thereof 20. deg. 10. min. is the Declination desired.

The Latitude and Declination giuen, to finde the Meridionall Altitude. Prop. 8.

If the Sunne haue North Declination, adde the complement of the Latitude with the Declination, the product is the Meridionall altitude.

Example.

If the Declination be 23. degrees 30. minutes, and the Latitude 51. degrees 40. minutes, the Complement thereof 38. degr. 20. added with 23. 30. minutes, makes 61. degrees 50. minutes, for the Meridian altitude: but if the Declination be 23. degr. 30. South, and the Latitude 51. degrees 40. minutes, substract 23. degrees 30. min. the Declination from 38. degrees 20. minutes, the

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the complement of the Latitude, and the remainder 14. degrees 50 minutes is the altitude desired: and if the Sunne be in the Equinoctiall, having no Declination, then is the Meridian altitude equal to the complement of the Latitude.

The Latitude and Declination knowne, to finde the height of the Sunne at any houre of the day.

Prop. 9.

First you are to consider, whether the Sunne be in the Equinoctiall, or whether he hath North or South declination, for if the Sunne be in the Equinoctiall, then as the whole sine is to the sine of the complement of the Latitude, so is the sine of the complement of the Sunnes distance from none, allowing 15. degrees for every houre to the sine of the altitude desired.

Example.

At any yeare or day, the Sunne then having no Declination, the Latitude 51. degrees 40. minutes, I desire the Sunnes height at 9. a clocke before none, or at thre afternone, the complement of the Latitude is 38. degrees 20. minutes and the houres distance from none, 45. degrees whose complement is also 45. degrees. Say then,

If	90	give	38.20	what	45
	10000		6202		7071.

Facit, 4385. whose arch 26. degr. is the height of the Sunne above the Horizon, the time and place proposed.

If the Sunne have declination, then is the working somewhat more tedious, except onely at 6. a clocke, either before or after none, for which houre, as the whole sine is to the sine of the Latitude, so is the sine of the Declination, to the sine of the Altitude.

Example.

The 10. of Aprill, 1624. the Latitude 51. degrees 40. min. and the Declination 11. degr. 48. minutes. Say,

If	90	give	51.40	what	11.48
	10000		7844		2045.

Facit, 1604. whose arch 9. deg. 14. min. is the Altitude desired.

But for any other houre of the day if it be lesse then 6. houres,

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or 90. degrees, worke as followes, multiply the sine of the houres distance from noone by the sine of the complement of the Latitude, the Product deuide by the whole sine, and the arch of the quotient taken from 90. set apart for the number first found, which number so found, compare with the Latitude, then multiply the whole sine, by the sine of the lesser, and deuide the Product thereof by the sine of the greater: and to the complement of the arch of the Product adde the Declination of the Sunne, if the Declination be Northerly, or subtract if the Declination be Southerly, and if the Product or remaine be more then 90. degrees, take it from 180. and the rest is the second found number, which two numbers so knowne,

As the whole Sine is to the number first found, so is the second found number to the Altitude desired.

Example.

Any yeare and day at 9. a clocke, the Latitude 51. degrees 40. min. the distance of the Sunne from noone 45. degr. and the Declination 11. deg. 43. min. I desire the Sunnes height. Say,

If 90 giue 38.20 what 45.
 10000 6202. 7071.

Facit 4385. whose arch 26. deg. taken from 90. leaues 64. deg. for the first found number, then comparing the Latitude, and it together, the Latitude being the lesser, I multiply the whole sine by the sine thereof, and deuide by the sine of the first found, saying,

If 64. 0. giue 51.40. what 90.
 8988. 7844 10000.

Facit, 8727. whose arch being 60. deg. 46. min. to the Complement thereof 29. degr. 14. min. I adde the Declination 11. deg. 43. min. and the totall 40. degr. 57. min. is the second found number, which two numbers so knowne, say againe,

If 90 giue 64. 0. what 40.57.
 10000 8988 6554.

Facit, 5890. whose arch 36. deg. 5. minutes, is the Altitude of the Sunne desired.

Againc, if the houre for which you desire the Sunnes height, be more then 6. houres or 90. degrees from the Meridian, you must

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must subtract the said distance from 180. and multiply the sine of the remainder, by the sine of the complement of the Latitude, which product being devided by the whole sine, the complement of the quotients arch is the first found number, the sine whereof compares with the sine of the Latitude, multiplying the whole sine by the lesser: and deviding the product by the greater: from the arch of which quotient, if you take the complement of the Declination, you have the second found number, the sine whereof multiplied by the sine of the first found, and the product devided by the totall sine, the quotients arch is the Altitude desired.

Example.

At 5. in the morning, the Latitude 51. deg. 40. min. the houres distance from noone 7. or 105. degr. which deducted from 180. leaues 75. deg. for the houre distance. Say then,

If 90 give 38.20 what 75.0.

10000 6202 9659.

Facit 5990. whose arch being 36. deg. 48. min. the complement thereof 53. 12 is the first found number: Say then againe.

If 53.12 give 51.40 what 90.

8007 7844 10000

Facit 9796. from whose arch 78. deg. 25. min. taking 78. deg. 17. min. the complement of the Sunnes declination, rests 8. min. for the second found number, which 2. numbers found. Say,

If 90 give 53.12 what 08.

10000 8007 023.

Facit, 18. whose arch 6. min. is the height of the Sunne above the Horizon at 5. in the morning, or 7. in the evening, the day and time aforesaid.

The Latitude giuen, to finde how many minutes or miles of the Equinoctiall, make a degree of Longitude in any Paralell.

Prop. 10.

As the whole sine is in proportion to 60. so is the sine of the complement of the Latitude, to the miles answerable to a degree in the Latitude desired.

I desire

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I desire to know how many miles in running East or West in the Latitude of 51. degrees 40. minutes, will alter one degree of Longitude? Say,

If	90	give	60	what	38.20
			10000		6202.

Facit, 37. for the number of miles, answerable to a degree, in the Latitude desired.

The course and distance giuen, to finde out the
difference of Latitude.

Prop. 11.

As the whole line is to the miles of way runne, so is the line of the courses distance from East to West, to the minutes of difference of Latitude.

Example.

Running West southwest, which is 22. degrees 30. minutes, from the West 75. leagues or 225. miles, I demaund the difference of Latitude? Say,

If	90	give	225	what	22.30
			10000		3827

Facit, 86. minutes or one degree 26. min. for the difference of Latitude vpon the said course and distance.

By course and distance giuen, to finde the difference
of Longitude. Prop. 12.

As the whole line is to the miles of way that you have runne, so is the line of the degrees that your course is distant from South or North to the miles that you are departed from your first Meridian.

Example.

Running Southwest and by North which is 33. dege. 45. min. from the North 60. leagues or 180. miles, I demaund the difference of Longitude? Say,

If	90	give	180	what	33.45
			10000		5556.

Facit, 100. miles which you are departed from the Meridian to

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to the westward, which if you deuide by the number of miles answerable to a degree of Longitude, in the Latitude where you then finde your selfe to be, the quotient giues you the degr. and min. of the difference of Longitude.

By the distance, and departure from the Meridian giuen, to finde the course.

Prop. 13.

As the miles of distance that you haue runne, is in proportion to the whole sine, so is the miles of your departure from the Meridian to the sine of your course from South or North.

Example.

Being departed from the first Meridian 75. miles in the running of 50. leagues, or a 150. miles, I demaund vpon what point I haue sayled, it being betwixt South and West: Say,

If 150 giue 10000 what 75.
Facit, 5000. whose arch 30. degr. is the distance from South towards West that the course is, which is Southwest and by South southerly.

The Latitude, Declination and height of the Sunne giuen, to know the houre of the day.

Prop. 14.

Adde the complement of the Latitude, and the Declination together, and from the sine of the totall, subtract the sine of the Altitude obserued, the remainer is your number first found, which number first found, multiply by the whole sine, and deuide by the sine of the complement of the Latitude, the quotient wherof is the second found number, which second number so knowne, as the sine of the Complement of the Declination is to the totall sine, so is the said second found number to the quotient, which quotient taken from the whole sine, the complement of the arch to the remainer, is the Sunnes distance from none in degrees and minutes.

Example.

The 15. of May, the Declination 21. degrees 4. minutes, and the

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the Complement of the Latitude 38. degrees 20. minutes added together, is 59. degrees 24. minutes, the sine thereof 8607. the height of the Sunne observed 48. degrees 30. min. the sine thereof 7490. the which taken from the former number, leaues 1117. for the first found number: then I say,

If 38.20	giue 90	what
6202	10000	1801.

Facit, 1801. for the second found number. Againe say,

If 68.56	giue 90	what
9332	10000	1117.

Facit, 1929. which taken from 10000. leaues 8071. whose arch 53. degrees 49. minutes subtracted from 90. leaues 36. degrees 11. minutes, for the Sunnes distance from the Meridian: that conuerted into houres, is 2. houres 24. minutes from noone, when the Sunne is so high as aforesaid.

To finde the *Sinus versus* of any giuen Arch.

Prop. 15.

If the Arch giuen, be lesse then 90. subtract it from 90. and the sine of the remainder taken from the totall sine, leaues the *Sinus versus*, but if the giuen arch be greater then 90. degrees subtract 90. degrees therefrom, and seeke the sine of the remainder, which is alwayes the complement of the giuen arch: which *Sinus* added to the whole sine, and the totall thereof is the *Sinus versus* of the giuen arch desired.

Example.

To know the *Sinus versus* of 47. degrees 12. minutes, the complement thereof is 42. degrees 48. minutes, whose sine 6794. taken from 10000. the whole sine resteth 3206. the reuerfed sine of 47. degrees 12. minutes.

Likewise, to know the reuerfed sine of 137. degrees 25. min. which is more then 90. degrees, taking 90. therefrom, there resteth 47. degrees 25. minutes, the *Sinus* whereof 7363. added to the whole sine, maketh 17363. for the reuerfed sine of 137. degr. 25. minutes.

A Table of Sines.

The Degtees of the Quadrant.

M.	0	1	2	3	4	5	6	7	8	9
1	3	177	352	526	700	874	1048	1222	1395	1567
2	6	180	355	529	703	877	1051	1224	1398	1570
3	9	183	353	532	706	881	1054	1227	1400	1573
4	12	186	361	535	709	883	1057	1230	1403	1576
5	14	188	363	538	712	886	1060	1233	1406	1579
6	17	192	366	541	715	889	1063	1236	1409	1582
7	20	195	369	544	718	892	1065	1239	1412	1584
8	23	198	372	547	721	895	1068	1242	1415	1587
9	26	201	375	549	724	898	1071	1245	1418	1590
10	29	204	378	552	727	900	1074	1247	1421	1593
11	32	206	381	555	729	903	1077	1250	1424	1596
12	35	209	384	558	732	906	1080	1253	1426	1599
13	38	212	387	561	735	909	1083	1256	1429	1602
14	41	215	390	564	738	912	1086	1259	1432	1605
15	44	218	393	567	741	915	1089	1262	1435	1608
16	46	221	395	570	744	918	1091	1265	1438	1610
17	49	224	398	573	747	921	1097	1268	1441	1613
18	52	227	401	576	750	924	1094	1271	1444	1616
19	55	230	404	578	753	927	1100	1273	1446	1619
20	58	233	407	581	756	930	1103	1276	1449	1622
21	61	235	410	584	758	932	1106	1279	1452	1625
22	64	238	413	587	761	935	1109	1282	1455	1627
23	67	241	416	590	764	938	1112	1285	1458	1630
24	70	244	419	593	767	941	1115	1288	1461	1633
25	73	247	422	596	770	944	1118	1291	1464	1636
26	76	250	425	599	773	947	1120	1294	1467	1639
27	78	253	427	602	776	950	1123	1297	1469	1642
28	81	256	430	605	779	953	1126	1299	1472	1645
29	84	259	433	608	782	956	1129	1302	1475	1648
30	87	262	436	610	785	959	1132	1305	1478	1650

A Table of Sines.

The Degrees of the Quadrant.

M.	0	1	2	3	4	5	6	7	8	9
31	92	265	439	613	787	961	1135	1308	1481	1653
32	93	268	442	616	790	964	1138	1311	1484	1656
33	96	270	445	619	793	967	1141	1314	1487	1659
34	99	273	448	622	796	970	1144	1317	1490	1662
35	102	276	451	625	799	973	1146	1320	1492	1665
36	105	279	454	628	802	976	1149	1322	1495	1668
37	107	282	456	631	805	979	1152	1325	1498	1670
38	110	285	459	634	808	982	1155	1328	1501	1673
39	113	288	462	637	811	985	1158	1331	1504	1676
40	116	291	465	640	814	987	1161	1334	1507	1679
41	119	294	468	642	816	990	1164	1337	1510	1682
42	122	297	471	645	819	993	1167	1340	1513	1685
43	125	300	474	648	822	996	1170	1343	1515	1688
44	128	302	477	651	825	999	1172	1346	1518	1691
45	131	305	480	654	828	1002	1175	1348	1521	1693
46	134	308	483	657	831	1005	1178	1351	1524	1696
47	137	311	485	660	834	1008	1181	1354	1527	1699
48	140	314	488	663	837	1011	1184	1357	1530	1702
49	142	317	491	666	840	1013	1187	1360	1533	1705
50	145	320	494	668	843	1016	1190	1363	1536	1708
51	148	323	497	671	845	1019	1193	1366	1538	1711
52	151	326	500	674	848	1022	1196	1369	1541	1714
53	154	329	503	677	851	1025	1198	1372	1544	1716
54	157	331	506	680	854	1028	1201	1374	1547	1719
55	160	334	509	683	857	1031	1204	1377	1550	1722
56	163	337	512	686	860	1034	1207	1380	1553	1725
57	166	340	515	689	863	1037	1210	1382	1556	1728
58	169	343	517	692	866	1039	1213	1386	1559	1731
59	172	347	520	695	869	1042	1216	1389	1561	1734
60	174	350	523	697	871	1045	1219	1392	1564	1736

A Table of Sines.

The Degrees of the Quadrant.

M.	10	11	12	13	14	15	16	17	18	19
1	1739	1911	2082	2252	2422	2591	2759	2926	3093	3258
2	1742	1914	2085	2255	2425	2594	2762	2929	3096	3261
3	1745	1917	2088	2258	2428	2597	2765	2932	3098	3264
4	1747	1919	2090	2261	2430	2599	2767	2935	3101	3267
5	1750	1922	2093	2264	2433	2602	2770	2938	3104	3269
6	1753	1925	2096	2267	2436	2605	2773	2940	3107	3272
7	1756	1928	2099	2269	2439	2608	2776	2943	3109	3275
8	1759	1931	2102	2272	2542	2611	2779	2946	3112	3278
9	1762	1934	2205	2175	2445	2613	2781	2949	3115	3280
10	1765	1937	2107	2278	2447	2616	2784	2951	3118	3283
11	1767	1939	2110	2281	2450	2619	2787	2954	3120	3286
12	1770	1942	2113	2283	2453	2622	2790	2957	3123	3289
13	1773	1945	2117	2286	2456	2625	2793	2960	3126	3291
14	1776	1948	2119	2289	2459	2628	2795	2963	3129	3294
15	1779	1951	2122	2292	2462	2630	2798	2965	3132	3297
16	1782	1954	2125	2295	2464	2633	2801	2968	3134	3300
17	1785	1957	2127	2298	2467	2636	2804	2971	3137	3302
18	1788	1959	2130	2300	2470	2639	2807	2974	3140	3305
19	1790	1962	2133	2303	2473	2641	2809	2976	3143	3308
20	1793	1965	2136	2306	2476	2644	2812	2979	3146	3311
21	1796	1968	2139	2309	2478	2647	2815	2982	3148	3313
22	1799	1971	2142	2312	2481	2650	2818	2985	3151	3316
23	1802	1974	2145	2315	2484	2653	2821	2988	3154	3319
24	1805	1977	2147	2317	2487	2655	2823	2990	3156	3322
25	1808	1979	2150	2320	2490	2658	2826	2993	3159	3324
26	1810	1982	2153	2323	2492	2661	2829	2996	3162	3327
27	1813	1985	2156	2326	2495	2664	2832	2999	3165	3330
28	1816	1988	2159	2329	2498	2667	2835	3001	3167	3332
29	1819	1991	2161	2331	2501	2669	2837	3004	3170	3335
30	1822	1994	2164	2334	2504	2672	2840	3007	3173	3338

A Table of Sines.

The Degrees of the Quadrant.

M.	10	11	12	13	14	15	16	17	18	19
31	1825	1996	2167	2337	2507	2675	2843	3010	3176	3341
32	1828	1999	2170	2340	2509	2678	2846	3013	3178	3343
33	1830	2002	2173	2343	2512	2681	2848	3015	3181	3346
34	1833	2005	2176	2346	2515	2683	2851	3018	3184	3349
35	1836	2008	2178	2349	2518	2686	2854	3021	3187	3352
36	1839	2011	2181	2351	2521	2689	2857	3024	3189	3354
37	1842	2014	2184	2354	2524	2692	2860	3026	3192	3357
38	1845	2016	2187	2357	2526	2695	2862	3029	3195	3360
39	1848	2019	2190	2360	2529	2698	2865	3032	3198	3363
40	1850	2022	2193	2363	2532	2700	2868	3035	3201	3365
41	1853	2025	2196	2365	2535	2703	2871	3037	3203	3368
42	1856	2028	2198	2368	2538	2706	2874	3040	3206	3371
43	1859	2031	2201	2371	2540	2709	2876	3043	3209	3374
44	1862	2034	2204	2374	2543	2712	2879	3046	3212	3376
45	1865	2036	2207	2377	2546	2714	2882	3049	3214	3379
46	1868	2039	2210	2380	2549	2717	2885	3051	3217	3382
47	1870	2042	2213	2382	2552	2720	2887	3054	3220	3385
48	1873	2045	2216	2385	2555	2723	2890	3057	3223	3387
49	1876	2048	2218	2388	2557	2726	2893	3060	3225	3390
50	1879	2051	2221	2391	2560	2728	2896	3062	3228	3393
51	1882	2053	2224	2394	2563	2731	2899	3065	3231	3396
52	1885	2056	2227	2397	2566	2734	2901	3068	3234	3398
53	1888	2059	2230	2399	2568	2737	2904	3071	3236	3401
54	1891	2062	2231	2402	2571	2740	2907	3073	3239	3404
55	1894	2065	2235	2405	2574	2742	2910	3076	3242	3406
56	1896	2068	2238	2409	2577	2745	2913	3079	3245	3409
57	1899	2070	2241	2411	2580	2748	2915	3082	3247	3412
58	1902	2073	2244	2414	2583	2751	2918	3085	3250	3415
59	1905	2076	2247	2416	2585	2754	2921	3087	3253	3417
60	1908	2079	2249	2419	2588	2756	2924	3090	3256	3420

A Table of Sines.

The Degtees of the Quadrant.

M.	20	21	22	23	24	25	26	27	28	29
1	3423	3586	3749	3910	4070	4229	4386	4542	4697	4851
2	3426	3589	3751	3913	4073	4231	4389	4545	4700	4853
3	3428	3592	3754	3915	4075	4234	4391	4548	4702	4856
4	3431	3594	3757	3918	4078	4237	4394	4550	4705	4858
5	3434	3597	3759	3921	4081	4239	4396	4553	4707	4861
6	3437	3600	3762	3923	4083	4242	4399	4555	4710	4863
7	3439	3603	3765	3926	4086	4245	4402	4558	4713	4866
8	3442	3605	3768	3929	4089	4247	4404	4561	4715	4868
9	3445	3608	3770	3931	4091	4250	4407	4563	4718	4871
10	3447	3611	3773	3934	4094	4252	4410	4566	4720	4873
11	3450	3613	3776	3937	4096	4255	4412	4568	4723	4876
12	3453	3616	3778	3939	4099	4258	4415	4571	4725	4878
13	3456	3619	3781	3942	4102	4260	4418	4573	4728	4881
14	3458	3622	3784	3945	4104	4263	4420	4576	4731	4883
15	3461	3624	3786	3947	4107	4266	4423	4579	4733	4886
16	3464	3627	3789	3950	4110	4268	4425	4581	4736	4888
17	3467	3630	3792	3953	4112	4271	4428	4584	4738	4891
18	3469	3632	3794	3955	4115	4274	4431	4586	4741	4893
19	3472	3635	3797	3958	4118	4276	4433	4589	4743	4896
20	3475	3638	3800	3961	4120	4279	4436	4592	4746	4898
21	3477	3641	3803	3963	4123	4281	4438	4594	4748	4901
22	3480	3643	3805	3966	4126	4284	4441	4597	4751	4904
23	3483	3646	3808	3969	4128	4287	4444	4599	4754	4906
24	3486	3649	3811	3971	4131	4289	4446	4602	4756	4909
25	3488	3651	3813	3974	4134	4292	4449	4604	4759	4911
26	3491	3654	3816	3977	4136	4295	4451	4607	4761	4914
27	3494	3657	3819	3979	4139	4297	4454	4610	4764	4916
28	3497	3660	3821	3982	4142	4300	4457	4612	4766	4919
29	3499	3662	3824	3985	4144	4302	4459	4615	4769	4921
30	3502	3665	3827	3987	4147	4305	4462	4617	4771	4924

A Table of Sines.

The Degrees of the Quadrant.

M.	20	21	22	23	24	25	26	27	28	29
31	3505	3668	3829	3990	4149	4308	4464	4620	4774	4927
32	3507	3670	3832	3993	4152	4310	4467	4623	4777	4929
33	3510	3673	3835	3995	4155	4313	4470	4625	4779	4932
34	3513	3676	3837	3998	4157	4316	4472	4628	4782	4934
35	3516	3679	3840	4001	4160	4318	4475	4630	4784	4937
36	3518	3681	3843	4003	4163	4321	4478	4633	4787	4939
37	3521	3684	3846	4006	4165	4324	4480	4635	4789	4942
38	3524	3687	3848	4009	4168	4326	4483	4638	4792	4944
39	3527	3689	3851	4011	4171	4329	4485	4641	4794	4947
40	3529	3692	3854	4014	4173	4331	4488	4643	4797	4949
41	3532	3695	3856	4017	4176	4334	4490	4646	4799	4952
42	3535	3697	3859	4019	4178	4336	4493	4648	4802	4954
43	3537	3700	3862	4022	4181	4338	4496	4651	4805	4957
44	3540	3703	3864	4025	4184	4342	4498	4653	4807	4960
45	3543	3706	3867	4028	4186	4344	4501	4656	4810	4962
46	3546	3708	3870	4030	4189	4347	4503	4659	4812	4965
47	3548	3711	3872	4033	4192	4350	4506	4661	4815	4967
48	3551	3714	3875	4035	4194	4352	4509	4664	4817	4970
49	3554	3716	3878	4038	4197	4355	4511	4666	4820	4972
50	3556	3719	3880	4041	4200	4357	4514	4669	4822	4975
51	3559	3722	3883	4043	4202	4360	4516	4671	4825	4977
52	3562	3724	3886	4046	4205	4363	4519	4674	4828	4980
53	3565	3727	3888	4049	4208	4365	4522	4677	4830	4982
54	3567	3730	3891	4051	4210	4368	4524	4679	4833	4985
55	3570	3732	3894	4054	4213	4371	4527	4682	4835	4987
56	3573	3735	3896	4057	4216	4373	4529	4684	4838	4990
57	3575	3738	3899	4059	4218	4376	4532	4687	4840	4992
58	3578	3741	3902	4062	4221	4378	4535	4689	4843	4995
59	3581	3743	3905	4065	4224	4381	4537	4692	4845	4997
60	3584	3746	3908	4067	4226	4384	4540	4695	4848	5000

A Table of Sines.

The Degrees of the Quadrant.

M.	30	31	32	33	34	35	36	37
1	5002	5153	5302	5449	5594	5738	5880	6020
2	5005	5155	5304	5451	5597	5740	5882	6023
3	5007	5158	5306	5454	5599	5743	5885	6025
4	5010	5160	5309	5456	5601	5745	5887	6027
5	5012	5163	5311	5458	5604	5748	5890	6030
6	5015	5165	5314	5461	5606	5750	5892	6032
7	5017	5168	5316	5463	5609	5752	5894	6034
8	5020	5170	5319	5466	5611	5755	5896	6037
9	5022	5173	5321	5468	5614	5757	5899	6039
10	5025	5175	5324	5471	5616	5759	5901	6041
11	5027	5178	5326	5473	5618	5762	5904	6044
12	5030	5180	5329	5476	5621	5764	5906	6046
13	5032	5183	5331	5478	5623	5767	5909	6048
14	5035	5185	5334	5480	5625	5769	5911	6051
15	5037	5188	5336	5483	5628	5771	5913	6053
16	5040	5190	5339	5485	5630	5774	5915	6055
17	5042	5193	5341	5488	5633	5776	5918	6057
18	5045	5195	5343	5490	5635	5778	5920	6060
19	5048	5198	5346	5493	5638	5781	5922	6062
20	5050	5200	5348	5495	5644	5783	5925	6064
21	5053	5203	5351	5497	5642	5785	5927	6067
22	5055	5205	5353	5500	5645	5788	5929	6069
23	5058	5208	5356	5502	5647	5790	5932	6071
24	5060	5210	5358	5505	5650	5793	5934	6074
25	5063	5212	5361	5507	5652	5795	5936	6076
26	5065	5215	5363	5509	5654	5797	5939	6078
27	5068	5217	5366	5512	5657	5800	5941	6081
28	5070	5220	5368	5514	5659	5802	5943	6083
29	5073	5222	5370	5517	5662	5805	5946	6085
30	5075	5225	5373	5519	5664	5807	5948	6088

A Table of Sines.

The Degrees of the Quadrant.

M.	30	31	32	33	34	35	36	37
31	5078	5227	5375	5522	5666	5809	5950	6090
32	5080	5230	5378	5524	5669	5812	5953	6092
33	5083	5232	5380	5527	5671	5814	5955	6094
34	5085	5235	5383	5529	5674	5816	5957	6097
35	5088	5237	5385	5531	5676	5819	5960	6099
36	5090	5240	5388	5534	5678	5821	5962	6101
37	5093	5242	5390	5536	5681	5823	5964	6104
38	5095	5245	5393	5539	5683	5826	5967	6106
39	5098	5247	5395	5541	5685	5828	5969	6108
40	5100	5250	5397	5543	5688	5831	5971	6111
41	5103	5252	5400	5546	5690	5833	5974	6113
42	5105	5255	5402	5548	5693	5835	5976	6115
43	5108	5257	5404	5551	5695	5838	5978	6117
44	5110	5260	5407	5553	5697	5840	5981	6120
45	5113	5262	5410	5556	5700	5842	5983	6122
46	5115	5265	5412	5558	5702	5845	5985	6124
47	5118	5267	5415	5560	5705	5847	5988	6127
48	5120	5269	5417	5563	5707	5849	5990	6129
49	5123	5272	5419	5565	5709	5852	5992	6131
50	5127	5274	5422	5568	5712	5854	5995	6134
51	5128	5277	5424	5570	5714	5856	5997	6136
52	5130	5279	5427	5573	5717	5859	5999	6138
53	5133	5282	5429	5575	5719	5861	6002	6140
54	5135	5284	5432	5577	5721	5864	6004	6143
55	5138	5287	5434	5580	5724	5866	6006	6145
56	5140	5289	5437	5582	5726	5868	6009	6147
57	5143	5292	5439	5585	5729	5871	6011	6149
58	5145	5294	5441	5587	5731	5873	6013	6152
59	5148	5297	5444	5589	5733	5875	6016	6154
60	5150	5299	5446	5592	5736	5878	6018	6156

A Table of Sines.

The Degrees of the Quadrant.

M.	38	39	40	41	42	43	44	45
1	6159	6295	6430	6563	6694	6822	6949	7073
2	6161	6298	6432	6565	6696	6824	6951	7075
3	6163	6300	6434	6567	6698	6825	6953	7077
4	6166	6302	6437	6569	6700	6828	6955	7079
5	6168	6304	6439	6571	6702	6831	6957	7081
6	6170	6307	6441	6574	6704	6833	6959	7083
7	6173	6309	6443	6576	6706	6835	6961	7085
8	6175	6311	6445	6578	6708	6837	6963	7087
9	6177	6313	6448	6580	6711	6839	6965	7089
10	6179	6316	6450	6583	6713	6841	6967	7092
11	6182	6318	6452	6585	6715	6843	6969	7094
12	6184	6320	6454	6587	6717	6845	6972	7096
13	6186	6322	6457	6589	6719	6848	6974	7098
14	6189	6325	6459	6591	6721	6850	6976	7100
15	6191	6327	6461	6593	6724	6852	6978	7102
16	6193	6329	6463	6596	6726	6854	6980	7104
17	6195	6331	6466	6598	6728	6856	6982	7106
18	6198	6334	6469	6600	6730	6858	6984	7108
19	6200	6336	6470	6602	6732	6860	6986	7110
20	6202	6338	6472	6604	6734	6862	6988	7112
21	6205	6340	6474	6606	6736	6864	6990	7114
22	6207	6343	6477	6608	6738	6867	6992	7116
23	6209	6345	6479	6611	6741	6869	6994	7118
24	6211	6347	6481	6613	6743	6871	6997	7120
25	6213	6349	6483	6615	6745	6874	6999	7122
26	6216	6352	6486	6617	6747	6875	7001	7124
27	6218	6354	6488	6619	6749	6877	7004	7126
28	6220	6356	6490	6622	6752	6879	7005	7128
29	6223	6358	6492	6624	6754	6881	7007	7130
30	6225	6361	6494	6626	6756	6883	7009	7132

A Table of Sines.

The Degrees of the Quadrant.

M.	38	39	40	41	42	43	44	45
31	6227	6363	6497	6628	6758	6886	7011	7134
32	6230	6365	6499	6630	6760	6888	7013	7136
33	6232	6367	6501	6633	6762	6890	7015	7139
34	6234	6370	6503	6635	6764	6892	7017	7141
35	6236	6372	6505	6637	6766	6894	7019	7143
36	6239	6374	6508	6639	6769	6896	7021	7145
37	6241	6376	6510	6641	6771	6898	7023	7147
38	6243	6379	6512	6644	6773	6900	7026	7149
39	6245	6381	6514	6646	6775	6902	7028	7151
40	6248	6383	6516	6648	6777	6905	7030	7153
41	6250	6385	6519	6650	6779	6907	7032	7155
42	6252	6387	6521	6652	6781	6909	7034	7157
43	6255	6390	6523	6654	6783	6911	7036	7159
44	6257	6392	6525	6657	6786	6913	7038	7161
45	6259	6394	6527	6659	6788	6915	7040	7163
46	6261	6396	6530	6661	6790	6917	7042	7165
47	6264	6399	6532	6663	6792	6919	7044	7167
48	6266	6401	6534	6665	6794	6921	7046	7169
49	6268	6403	6536	6667	6796	6923	7048	7171
50	6270	6405	6539	6670	6799	6925	7050	7173
51	6273	6408	6541	6672	6801	6928	7052	7175
52	6275	6410	6543	6674	6803	6930	7054	7177
53	6277	6412	6545	6676	6805	6932	7057	7179
54	6279	6414	6547	6678	6807	6934	7059	7181
55	6282	6417	6550	6680	6809	6936	7061	7183
56	6284	6419	6552	6683	6811	6938	7063	7185
57	6286	6421	6554	6685	6813	6940	7065	7187
58	6289	6423	6556	6687	6816	6942	7067	7189
59	6291	6426	6558	6689	6818	6944	7069	7191
60	6293	6428	6560	6691	6820	6946	7071	7193

A Table of Sines.

The Degrees of the Quadrant.

M.	46	47	48	49	50	51	52	53
1	7195	7315	7433	7549	7662	7773	7882	7988
2	7197	7317	7435	7551	7664	7775	7884	7990
3	7199	7319	7437	7553	7666	7777	7885	7992
4	7201	7321	7439	7555	7668	7779	7887	7993
5	7203	7323	7441	7557	7670	7781	7889	7995
6	7205	7325	7443	7559	7672	7782	7891	7997
7	7207	7327	7445	7360	7673	7784	7893	7998
8	7209	7329	7447	7562	7675	7786	7894	8000
9	7211	7331	7449	7564	7677	7788	7896	8002
10	7213	7333	7451	7566	7679	7790	7898	8004
11	7215	7335	7453	7568	7681	7791	7900	8005
12	7218	7337	7455	7570	7683	7793	7901	8007
13	7220	7339	7457	7572	7685	7795	7903	8009
14	7222	7341	7459	7574	7687	7797	7905	8011
15	7224	7343	7461	7576	7688	7799	7907	8012
16	7226	7345	7463	7577	7690	7801	7909	8014
17	7228	7347	7464	7579	7692	7803	7910	8016
18	7230	7349	7466	7581	7694	7804	7912	8018
19	7232	7351	7468	7583	7696	7806	7914	8019
20	7234	7353	7470	7585	7698	7808	7916	8021
21	7236	7355	7472	7587	7700	7810	7918	8023
22	7238	7357	7474	7589	7701	7811	7919	8025
23	7240	7359	7476	7591	7703	7813	7921	8026
24	7242	7361	7478	7593	7705	7815	7923	8028
25	7244	7363	7480	7595	7707	7817	7925	8030
26	7246	7365	7482	7596	7709	7819	7926	8032
27	7248	7367	7484	7598	7711	7821	7928	8033
28	7250	7369	7486	7600	7712	7822	7930	8035
29	7252	7371	7488	7602	7714	7824	7932	8037
30	7254	7373	7490	7604	7716	7826	7933	8038

A Table of Sines.

The Degrees of the Quadrant.

M.	46	47	48	49	50	51	52	53
31	7256	7375	7491	7606	7718	7828	7935	8040
32	7258	7377	7493	7608	7720	7830	7937	8042
33	7260	7379	7495	7610	7722	7832	7939	8044
34	7262	7381	7497	7612	7724	7833	7941	8045
35	7264	7382	7499	7614	7725	7835	7942	8047
36	7266	7384	7501	7615	7727	7837	7944	8049
37	7268	7386	7503	7617	7729	7839	7946	8051
38	7270	7388	7505	7619	7731	7840	7948	8052
39	7272	7390	7507	7621	7733	7842	7949	8054
40	7274	7392	7509	7623	7735	7844	7951	8056
41	7276	7394	7511	7625	7737	7846	7953	8058
42	7278	7396	7513	7627	7739	7848	7955	8059
43	7280	7398	7514	7629	7740	7849	7955	8061
44	7282	7400	7516	7630	7742	7851	7958	8063
45	7284	7402	7518	7632	7744	7853	7960	8064
46	7286	7404	7520	7634	7746	7855	7962	8066
47	7288	7406	7522	7636	7748	7857	7963	8068
48	7290	7408	7524	7638	7750	7858	7965	8070
49	7292	7410	7526	7640	7751	7860	7967	8071
50	7294	7412	7528	7642	7753	7862	7969	8073
51	7296	7414	7530	7644	7755	7864	7970	8075
52	7298	7416	7532	7645	7757	7866	7972	8076
53	7300	7418	7534	7647	7759	7867	7974	8078
54	7301	7420	7536	7649	7760	7869	7976	8080
55	7303	7422	7537	7651	7762	7871	7977	8082
56	7305	7424	7539	7653	7764	7873	7979	8083
57	7307	7426	7541	7655	7766	7875	7981	8085
58	7309	7428	7543	7657	7768	7876	7983	8087
59	7311	7430	7545	7658	7770	7878	7985	8088
60	7313	7431	7547	7660	7771	7880	7986	8090

A Table of Sines.

The Degrees of the Quadrant.

M.	54	55	56	57	58	59	60
1	8092	8193	8292	8388	8482	8573	8662
2	8094	8195	8294	8390	8483	8575	8663
3	8095	8197	8295	8391	8485	8576	8665
4	8097	8198	8297	8393	8487	8578	8666
5	8099	8200	8298	8395	8489	8579	8668
6	8100	8201	8300	8396	8490	8581	8669
7	8102	8203	8302	8398	8491	8582	8670
8	8104	8205	8303	8399	8493	8584	8672
9	8105	8206	8305	8401	8494	8585	8673
10	8107	8208	8307	8402	8496	8587	8675
11	8109	8210	8308	8404	8497	8588	8676
12	8111	8212	8310	8406	8499	8590	8678
13	8112	8213	8311	8407	8500	8591	8679
14	8114	8215	8313	8409	8502	8593	8681
15	8116	8216	8315	8410	8503	8594	8682
16	8117	8218	8316	8412	8504	8596	8684
17	8119	8220	8318	8414	8506	8597	8685
18	8121	8221	8319	8415	8507	8599	8687
19	8122	8223	8321	8417	8509	8600	8688
20	8124	8225	8323	8418	8511	8602	8690
21	8126	8226	8324	8420	8513	8603	8691
22	8128	8228	8326	8421	8514	8605	8692
23	8129	8230	8328	8423	8516	8606	8694
24	8131	8231	8329	8424	8517	8607	8695
25	8133	8233	8331	8426	8519	8608	8697
26	8134	8235	8332	8428	8520	8610	8698
27	8136	8236	8334	8429	8522	8612	8699
28	8138	8238	8336	8431	8523	8613	8701
29	8139	8240	8337	8432	8525	8615	8702
30	8141	8241	8339	8434	8526	8616	8704

A Table of Sines.

The Degrees of the Quadrant.

M.	54	55	56	57	58	59	60
31	8143	8243	8340	8435	8528	8618	8705
32	8144	8245	8342	8437	8529	8619	8706
33	8146	8246	8344	8438	8531	8621	8708
34	8148	8248	8346	8440	8532	8622	8709
35	8149	8249	8347	8442	8535	8623	8711
36	8151	8251	8348	8443	8536	8627	8712
37	8153	8253	8350	8445	8537	8628	8713
38	8155	8254	8352	8446	8539	8629	8715
39	8156	8256	8353	8448	8540	8630	8716
40	8158	8257	8355	8449	8542	8631	8718
41	8160	8259	8356	8451	8543	8633	8719
42	8161	8261	8358	8452	8545	8634	8721
43	8163	8263	8360	8454	8546	8636	8722
44	8165	8264	8361	8455	8548	8637	8724
45	8166	8266	8363	8457	8549	8638	8725
46	8168	8267	8364	8458	8551	8640	8726
47	8170	8269	8366	8460	8552	8641	8728
48	8171	8271	8367	8462	8554	8643	8729
49	8172	8272	8369	8463	8555	8644	8731
50	8174	8274	8371	8465	8557	8646	8732
51	8176	8276	8372	8466	8558	8647	8733
52	8178	8277	8374	8468	8560	8649	8735
53	8180	8279	8375	8470	8561	8650	8736
54	8181	8281	8377	8471	8563	8653	8738
55	8183	8282	8379	8473	8564	8654	8739
56	8185	8284	8380	8474	8566	8655	8740
57	8186	8285	8382	8476	8567	8656	8742
58	8188	8287	8383	8477	8568	8657	8743
59	8190	8289	8385	8479	8569	8659	8745
60	8191	8290	8387	8480	8570	8660	8746

A Table of Sines.

The Degrees of the Quadrant.

M.	61	62	63	64	65	66	67
2	8749	8832	8913	8990	9065	9138	9207
4	8752	8835	8915	8993	9068	9140	9209
6	8755	8838	8918	8995	9070	9142	9212
8	8758	8841	8921	8998	9073	9145	9214
10	8760	8843	8923	9000	9075	9147	9216
12	8763	8846	8926	9003	9078	9149	9218
14	8766	8849	8928	9006	9080	9152	9221
16	8769	8852	8931	9008	9083	9154	9223
18	8771	8854	8934	9011	9085	9156	9225
20	8774	8857	8936	9013	9087	9159	9228
22	8777	8860	8939	9016	9090	9161	9230
24	8780	8862	8941	9018	9092	9164	9232
26	8783	8865	8944	9021	9095	9166	9234
28	8785	8867	8947	9023	9097	9168	9236
30	8788	8870	8949	9026	9100	9171	9239
32	8791	8873	8952	9028	9102	9173	9241
34	8794	8875	8954	9031	9104	9175	9243
36	8796	8878	8957	9033	9107	9177	9245
38	8799	8880	8960	9036	9109	9180	9247
40	8802	8883	8962	9038	9112	9182	9250
42	8805	8886	8965	9041	9114	9184	9252
44	8808	8889	8967	9043	9116	9187	9254
46	8810	8891	8970	9046	9119	9189	9256
48	8813	8894	8972	9048	9121	9191	9259
50	8816	8807	8975	9051	9123	9194	9261
52	8819	8899	8978	9054	9126	9196	9263
54	8821	8992	8980	9056	9128	9198	9265
56	8824	8905	8983	9058	9131	9200	9267
58	8827	8907	8985	9061	9133	9203	9270
60	8830	8910	8988	9063	9135	9205	9272

A Table of Sines.

The Degrees of the Quadrant.

M.	68	69	70	71	72	73	74
2	9274	9338	9399	9457	9512	9565	9614
4	9276	9340	9401	9459	9514	9566	9616
6	9278	9342	9403	9461	9516	9568	9617
8	9280	9344	9405	9463	9518	9570	9619
10	9283	9346	9407	9465	9519	9571	9620
12	9285	9348	9409	9466	9521	9573	9622
14	9287	9351	9411	9468	9523	9575	9624
16	9289	9352	9413	9470	9525	9576	9625
18	9291	9354	9415	9472	9527	9578	9627
20	9293	9356	9417	9474	9528	9580	9628
22	9296	9358	9419	9476	9530	9581	9630
24	9298	9360	9420	9478	9532	9583	9632
26	9300	9363	9422	9480	9534	9585	9633
28	9302	9365	9424	9481	9535	9586	9635
30	9304	9367	9426	9483	9537	9588	9636
32	9306	9369	9428	9485	9539	9590	9638
34	9308	9371	9430	9487	9540	9591	9639
36	9310	9373	9432	9489	9542	9593	9641
38	9313	9375	9434	9491	9544	9595	9642
40	9315	9377	9436	9492	9546	9596	9644
42	9317	9379	9438	9494	9548	9598	9645
44	9319	9381	9440	9495	9549	9600	9647
46	9321	9383	9442	9498	9551	9601	9648
48	9323	9385	9444	9500	9553	9603	9650
50	9325	9387	9446	9501	9554	9604	9651
52	9327	9389	9447	9503	9556	9606	9653
54	9329	9391	9449	9505	9558	9608	9655
56	9332	9393	9451	9507	9559	9609	9656
58	9334	9395	9453	9509	9561	9611	9658
60	9336	9397	9455	9510	9563	9613	9659

A Table of Sines.

The Degrees of the Quadrant.

M.	75	76	77	78	79	80	81	82
5	9663	9706	9747	9784	9819	9850	9879	9905
10	9667	9710	9750	9787	9822	9853	9881	9907
15	9670	9713	9753	9790	9824	9855	9884	9909
20	9674	9717	9756	9793	9827	9858	9886	9911
25	9678	9720	9760	9796	9830	9860	9888	9912
30	9681	9724	9763	9799	9832	9863	9890	9914
35	9685	9727	9766	9802	9835	9865	9892	9916
40	9689	9730	9769	9805	9838	9868	9894	9918
45	9692	9734	9772	9808	9840	9870	9896	9920
50	9696	9737	9775	9811	9843	9872	9898	9922
55	9699	9740	9778	9813	9846	9874	9900	9924
60	9703	9744	9781	9816	9848	9877	9903	9925

The Degrees of the Quadrant.

M.	83	84	85	86	87	88	89
5	9927	9947	9963	9977	9987	9994	9998
10	9929	9948	9964	9978	9988	9995	9998
15	9931	9950	9965	9978	9988	9995	9998
20	9932	9951	9967	9979	9989	9996	9999
25	9934	9952	9968	9980	9990	9996	9999
30	9936	9954	9969	9981	9990	9996	9999
35	9937	9955	9970	9982	9991	9997	99
40	9939	9957	9971	9983	9992	9997	99
45	9940	9958	9972	9984	9992	9998	99
50	9942	9959	9973	9984	9993	9998	99
55	9944	9960	9975	9985	9993	9998	99
60	9945	9962	9976	9985	9994	9998	10000 10000

The



The Extraction of Rootes.

It is not vnnecessary, before we doe enter into the order and method of teaching how to extract a Roote, to shew the diuers kindes and their definitions: Therefore you must know that of Rootes there are sundry sortes, according to the quantities from which they are deriued, as the Squares, Cubes, Squared Squares, Surdsolides, &c. for the numbers receiue their names of the said quantities, euery quantity hauing his Roote which may be called the first quantity, because it is the side or beginning of the quantity whereunto it is set: Numbers of the second quantity are called squares, of the third Cubes, of the fourth Squared Squares, as before: wherein you may proceed infinitely if you will, but you shall seldom or neuer haue vse for the extraction of the Root of any quantity more then Squares and Cubes: A Square number is the Product of any number multiplied in it selfe, and the Roote thereof is the multiplier whereby the same square number is produced: As for example, 4. is a square number comming of the multiplication of 2. in it selfe which is the Roote thereof.

A Cubicke number is the Product of any number multiplied into it selfe, and the same product multiplied againe by the first number: As 2. multiplied by it selfe is 4. that product multiplied againe by 2. the first number makes 8. which is a Cubick number, and the Roote thereof is 2.

A Squared square number, is produced of 3. multiplications: first any number by it selfe makes a square number, that product againe by the first roote or multiplier, makes a Cubicke number, and lastly that product againe by the first number or roote, produceth a squared square number, as 2. multiplied in it selfe makes 4. a square number, that againe by 2. makes 8. which is a Cubicke number, and then that product againe by 2. produceth 16. which

The Sea-mans Kalender.

is a squared square number: and the Rote thereof is 2. A Surd-
solide number is the product of a number multiplied 4. times by
the Rote thereof: as 32. is a surd-
solide number, the Rote where-
of is 2. for 2. multiplied in it selfe is 4. that multiplied againe by
2. is 8. the same product againe by 2. makes 16. and lastly, the
same product multiplied by the first number 2. makes 32. there-
fore I conclude that 32. is a surd-
solide number, and the number
2. whereby the said number is produced, is the surd-
solide Rote
to the said number: And thus multiplying the last product by the
first number or Rote, you may proceede infinitely, but more
then these are needlesse, and as I said before, without any great or
common vse.

Now for the finding of the Rote, it must be done according to
the quantity whereof it taketh Denomination, as whether it be
of a Square or Cube, or otherwise: which knowne, let vs proceed
to the working thereof.

You must understand that the order of extracting the Rote of
any quantity, is not much unlike to division, differing onely in
this, that whereas in division the divisor is knowne, but here it
is to finde, also in Division you alwayes keepe one divisor, but in
this, you must change your divisor at each removing, which is at
the finding of every figure contained in the Rote: Now therefore
I will lay downe one generall way for the extraction of the Rote
of all quantities whatsoever, which is done by certaine numbers
applyed to each severall quantity, which are these: For the square
rote is one number required, which is 20. For the Cube two
numbers, which are 300. and 30. For the Squared square three
numbers, viz. 4000. 600. and 40.

Thus having declared the kindes, numbers, quantities, and
order of the extraction of all sortes of Rotes, it followeth that we
proceed to the practise thereof: And first to extract the Square
rote of any number, you must consider as before I have said, that
20. is the number for the same quantity: Also you must learne
by memozy the innt square of all the 9. unities, which if you know
not, this Table will stand in some head: where you see that a-
gainst every of the 9. unities aforesaid towards the right hand is
the

The Sea-mans Kalender.

the square of that unitie against which it doth stand: which **1** **1**
 knowne, set downe the number whereof you would extract **2** **4**
 the square root, then vnder the last figure at the right hand, **3** **9**
 put a prick, and then proceeding towards the left hand vnder **4** **16**
 der every second figure put a pricke, that done, draw with **5** **25**
 your pen a quotient as in diuision: Now for to finde the **6** **36**
 roote of your giuen number, seeke the greatest square num- **7** **49**
 ber contained in the number ouer the first prick, that square **8** **64**
 number take from the number ouer the said first prick, and **9** **81**
 set the remainer ouer it, the roote of which square number put in
 the quotient for the first figure of the roote: that roote multiply by
 20. the number for the square roote: and then looke how often the
 product thereof may be taken from the number ouer, or to the left
 hand of the second prick, which put in your quotient for the second
 figure of your roote: but this is to be noted for a generall rule, that
 you must take no greater number for your second figure, then that
 the square thereof added with the former product, may be taken
 from the number ouer the said second pricke: and also looke how
 many prickes are vnder your giuen number, so many figures
 must be in the quotient for the roote of the said number: then ha-
 uing found 2. figures in the quotient, if there be any more prickes,
 multiply the whole number in the quotient by 20. and seeke how
 often the product thereof may be taken from the number ouer or
 belonging to the next prick, which number, put in the quotient,
 and adding the square thereof to the former product, subtract the
 whole summe from the number ouer the said prick, and cancelling
 the said number as at each remoue you must doe, set the remainer
 ouer it, and if there be any more prickes vndone, doe as you did
 before, alwayes multiplying the quotient by 20. thereto adding
 the square of the last figure, and the totall summe being subtrac-
 ted from the last remainer, if there rest nothing, it is a square
 number or else not, which you may proue, if you multiply the roote
 by it selfe squarely, for the roote being truely extracted, will pro-
 duce the first giuen number. But because that examples are ea-
 siest for the vnderstanding, let 104976. be the giuen number
 whereof I would know the square roote, viz. what number being

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Seeke how oft it may be taken out of 2576. the
 number ouer the last prick, which may be done 4.
 times, for 4. times 640. is 2560. whereunto if I
 adde the square of 4. there will amount 2576.
 which because it may be taken from the number
 remaining ouer the last prick, I put 4. in the
 quotient for the last figure of the roote, and sub-
 stracting the former product of 2576. from the
 number ouer the last prick, which is likewise
 2576. there will rest nothing, therefore I cancell
 those figures likewise, and thereby conclude
 104976. to be a square number, and 324. to be
 the roote thereof: the prooffe whereof is by multi-
 plying the roote into it selfe squarely: for if you
 multiply 324. by 324. the first given number of
 104976. will be produced, the working thereof
 will be as aboue you may see.

This example in my minde, might be suffici-
 ent with often vse and practise to bring perfecti-
 on in this kinde of Extractions, because that al-
 though the summe be neuer so great, it is done
 all by one manner of worke: yet neuerthelesse, if
 I did not thinke that thou wouldest complaine
 rather of tediousnes of learning, then of the diffi-
 culty in teaching, I would giue another exam-
 ple: for variety of examples makes the worke
 seeme the moze easie, Therefore once againe: let 548730625.
 be a giuen number, whereof I would know the square roote,
 first I put prickes or points vnder the giuen number in such or-
 der as you see, beginning at the last figure towards the right
 hand, and proceeding towards the left, leauing one figure vn-
 pointed betwixt euery prick, where you see that the whole giuen
 number consists of 5. prickes, therefore of so many figures must
 your roote or quotient be: then drawing a quotient, I seeke the
 greatest square number in 5. which is the number ouer the first
 prick, which greatest square number I finde to be 4. and the roote

I 4

thereof

$$\begin{array}{r}
 104976 \\
 \underline{9} \\
 124 \\
 2576 \\
 \underline{} \\
 32 \\
 20 \\
 \underline{} \\
 640 \\
 4 \\
 \underline{} \\
 2560 \\
 16 \\
 \underline{} \\
 2576 \\
 \underline{} \\
 324 \\
 324 \\
 \underline{} \\
 1296 \\
 648 \\
 972 \\
 \underline{} \\
 104976
 \end{array}$$

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thereof 2. for two times 2. is foure, therefore I put 2. in the quotient, and taking 4. the square thereof from 5. the number over the first prick, there will rest 1. which I set over 5. cancelling the said 5. the working whereof will stand as a

1

gainst, then for the second figure of the roote I multiply 2. the first figure of the roote already found by 20. and the product is 40. that I seeke how often may be taken from 148. the number remaining over the second prick, which may be done 3. times, for 3. times 40. is 120. whereunto the square of 3. being added makes 129. then I put 3. in the quotient for the second figure of the roote, and subtracting 129. the last product from 148. the number remaining over the second prick, there will rest 19. which with the other figures betwixt them and the next prick, makes 1973. therefore I cancel the 148. and setting the remainder over it, I have 1973. for the number over the 3. prick, and 23. in the quotient for the 2. first figures of the roote, now for the third figure of the roote I multiply 23. the root already found by 20. the product is 460. which may be taken from 1973. the number remaining over the third prick 4. times, for 460. multiplied by 4. makes 1840. whereunto adding 16. the square of 4. the product is 1856. therefore I put 4. in the quotient for the third figure of the roote, and subtracting 1856. from 1973. the number over the third prick, there will remain 117. which with the other figures betwixt them and the next prick, makes 11706. for the number over the fourth prick, and there is in the quotient 234

548730625 2	
4	
20	
2	
40	
3	
120	
9	
129	
19	
548730625 23	
4	
129	
23	
20	
460	
4	
1840	
16	
1856	
117	
548730625 234	

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for the roote already found, the whole
 worke standing as above: Again, for to
 finde the fourth figure of the roote, I mul-
 tiply 234. the roote found, by 20. the pro-
 duct whereof is 4680. which may be ta-
 ken out of 11706. two times, for 4580.
 multiplied by 2. makes 9360. which with
 4. the square of 2. makes in all 9364. the
 same being subtracted from 11706. the
 number remaining ouer the fourth picke,
 there will rest 2342. which with the other
 figure betwixt them and the fifth or last
 picke; makes 234225. for the number
 remaining ouer the last picke, therefore
 making my subtraction, I set the remai-
 ner ouer it, and put 2. in the quotient
 for the fourth figure of the roote as you
 may see in the margine: then to finde
 the last figure of the roote of this giuen
 number aforesaid, I multiply the whole
 roote already found, viz. 2342. by 20. the
 product is 46840. which may be taken
 from 234225. the number ouer the last
 picke 5. times, for 46840. multiplied
 by 5. makes 234200. whereunto if I
 adde 25. the square of 5. the whole product
 will be 234225. which number is equall
 to the number ouer the last picke, there-
 fore I put 5. in the quotient, for the last fi-
 gure of the roote, and subtracting the
 whole summe of the last product, viz.
 234225. from the number ouer the last point or picke, which is
 likewise 234225. there will remaine nothing; whereby I finde
 548730625. the giuen number to be a square number, and the
 root therof to be 23425. which is the nuber found out in the quo-
 tient, as in this working thereof you may more plainly perceiue.

$$\begin{array}{r}
 11706 \\
 \times 234 \\
 \hline
 4580 \\
 1856 \\
 234 \\
 \hline
 9364 \\
 \hline
 234225 \\
 \times 23425 \\
 \hline
 1170625 \\
 4684500 \\
 23422500 \\
 \hline
 234225000 \\
 468450000 \\
 2342250000 \\
 \hline
 54873062500
 \end{array}$$

For

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For proof wherof, if you multiply
 23425. the roote squarely into it selfe,
 the product thereof will be equall to the
 first given number, as in this example
 you may see.

$$\begin{array}{r}
 123 \\
 \times 23425 \\
 \hline
 185625 \\
 468500 \\
 937000 \\
 2342250 \\
 \hline
 548730625
 \end{array}$$

I doubt not, but to any indifferent
 conceit these two examples will suffice
 as well as if I should contrive a whole
 volume thereof, when it is so that the gi-
 ven number is a right square number,
 but if the given number be not a square
 number, it is impossible for to finde an
 exact roote thereto, but that after the
 worke there will remaine something as
 a fraction or part of a number more to
 be added to the quotient: for the true
 and perfect valuation of which fraction
 or remainder, none as yet could attaine,
 but they have set downe so neere a way
 for the extraction of the roote of any
 number not being a square number, that thereby no great error
 may be perceivd: For the knowledge and better understanding
 of which, let this be a familiar example: you know that 16. is a
 right square number, and the square roote thereof is 4. but if you
 would extract the square roote of 18. you should have 4. in your
 quotient likewise for the roote thereof, but then there will rest 2.
 whereby you see that 18. is no square number, neither can you
 know what fraction to make of it, by reason that you have no
 certaine denisor, which might stand for denominator to the nu-
 merator or remainder: onely let this suffice, that to finde the nea-
 rest roote thereof, the rule is thus: double the remainder for the
 numerator and quadruple; viz. multiply the roote by 4. and
 thereto adde 1. for the denominator to the said
 numerator, as in this example to extract the
 nearest square roote of 18. I finde 4. to be
 in the quotient, and 2. remaining, which 2.

$$\begin{array}{r}
 129 \\
 1856 \\
 9364 \\
 234225 \\
 \hline
 23425 \\
 23425 \\
 \hline
 117125 \\
 46850 \\
 93700 \\
 70275 \\
 46850 \\
 \hline
 548730625
 \end{array}$$

being

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being doubled makes 4. for the numerator, and 4. the roote being multiplied by 4. makes 16. and 1. added therewith, makes 17. for denominator, whereby I say that $4\frac{1}{4}$ is the nearest square roote of 18. which may be found out, for if you reduce $\frac{1}{4}$. into one common denomination, and then multiply them squarely, the product will be $17\frac{1}{4}$. which is but $\frac{1}{4}$. too little.

Thus having declared the order how to extract the Square roote of any number, It resteth now that I shew the manner of extracting the Cube roote of any number: as for the principall uses thereof, you shall finde in the generall practice of the Mathematickes.

To finde out the Cube roote of any given number, being a right Cube number, first put downe the given number, and as in the square number you put pointes or prickes, beginning at the right hand and so towards the left, leaving betwixt each point one figure voyde, so in the extraction of the roote of a Cube number, you must leave two figures void or prickt betwixt every point, and as in the square roote, so likewise in this: looke how many points are under the given number, so many figures must be contained in the roote thereof, which is also to be obserued in extracting the roote of any quantity whatsoever: these things being considered, it is also necessary, that you know the greatest Cubicke number of every of the 9. vntities, whereof the Table heere under specified maketh explanation: where you see that against each vntity, standeth the Cube number thereof, which

being knowne, and the given number prickt,	1 1
with a quotient drawne as befoze I haue shew	2 8
ed: to extract the Cube roote, you haue 2. num	3 27
bers, viz. 300. and 30. but because the working	4 64
thereof would be too long to expresse in tearmes,	5 125
let 13824. be a given number, whereof I would	6 216
extract the Cube roote,	7 343

First I put down that number afozesaid, with	8 512
pointes vnder it, and a quotient in this order,	9 729

13824. whereby I see that the Roote thereof

must consist of two figures, because so many pointes doe belong

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belong vnto the giuen number, for the first figure whereof I seeke the greatest Cube number contained in 13. the number ouer the first point towards the left hand, which I finde to be 8. the Cube roote thereof, which is 2. I put in the quotient for the first figure of the roote, and subtracting 8. from 13. rests 5. which I put ouer 13. cancelling the said 13. which done, the worke will be as below.

Now for to finde the second figure of the roote, I set downe the 2. numbers which serueth for the extraction of the Cube roote, viz. 300. 30. and against 30. I put the roote already found, which is 2. and against 300. the square thereof which is 4. these two figures I set towards the left hand of them, then I multiply 300. by 4. the figure which standeth against it, and the product is 1200. that I seeke how often I may take from 5824. the number ouer the second prick, which I may doe foure times, therefore I put 4. in the quotient for the second figure, and vpon the right hand against 300. I set 4. the last found number in the quotient, and against 30. I put 16. the square thereof: and vnderneath 30. I put 64. which is the Cube of 4. then multiplying all the figures which are in a row into one product viz. 4. by 300. makes 1200. and that againe by 4. makes 4800. for that product: then for the next, 2. by 30. makes 60. and that by 16. makes 960. for the second product, which I set downe together, each vnder other. Lastly, because 64. hath no other number to be multiplied therewith, I put that downe vnder them, which done, I adde them all together, and the totall sum is 5824 the same subtracted from the number ouer the last prick, leaueth nothing, whereby I see that 13824. is a Cubick number, and the

$$\begin{array}{r}
 5 \\
 \times 3824 \mid 2 \\
 \hline
 8 \\
 4 \cdot 300 \cdot 4 \cdot \\
 2 \cdot 30 \cdot 16 \\
 64 \qquad 300 \\
 \qquad 4 \\
 \hline
 30 \qquad 1200 \\
 2 \qquad 4 \\
 \hline
 60 \qquad 4800 \\
 16 \qquad 960 \\
 \hline
 360 \qquad 4800 \\
 60 \qquad 960 \\
 \hline
 960 \qquad 4800 \\
 \qquad 960 \\
 \qquad 64 \\
 \hline
 5824
 \end{array}$$

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Cube roote thereof is 24. as you may more plainly see by the working thereof, which is put in the margine above, where you see that 24. being multiplied into it selfe, and that Product againe by 24. the first multiplier, the Product is 13824. which is equall to the first given number.

$$\begin{array}{r}
 5 \\
 24 \overline{) 13824} \\
 \underline{48} \\
 96 \\
 \underline{48} \\
 576 \\
 \underline{576} \\
 24 \\
 \underline{24} \\
 2304 \\
 \underline{1152} \\
 13824
 \end{array}$$

Againe, seeing that examples are the easiest Method of teaching, and plainest for understanding: let 12551868224. be a given number: whereof I would extract the Cube roote: First having prickt it and drawne a Quotient for the roote thus 12551868224. I see that the roote must consist of 4. figures, so many prickes being vnder the given Number. For the finding of which figures, I take first the greatest Cube number, in 12. which is 8. the roote whereof being 2. I put in the Quotient, for the first figure of the roote subtracting 8. the Cube thereof, from 12. the number over the first prick, rests 4. then for the second figure of the roote, I put downe 300. and 30. the numbers for the Cube roote, against 30. I set 2. the roote found: and against 300. 4. the Square thereof: and multiplying 300. by 4. the Product is 1200. that may be taken out of 4551. the number over the second prick 3. times, therefore I put 3. in the quotient, and likewise after 300. and the square thereof which is 9. after 30. and the Cube thereof which is 27. I put vnder 30. then I multiply all the numbers in the first row, each by the other, viz. 4. by 300. makes 1200. and the same Product againe by 3. makes 3600. which I set by it selfe: When againe I multiply 2. by 30. is 60. and that againe by 9. makes 540. which I put vnder the other Product; Lastly, because 27. hath no number wherewith to be multiplied, I set down likewise vnder both the other, and the three numbers being set in order one vnder another, as you see I adde them all together, and the whole product is 4167. the same I subtract from 4551. the number over the next prick, 4167

$$\begin{array}{r}
 4 \\
 23 \overline{) 12551868224} \\
 \underline{8} \\
 4551 \\
 \underline{3600} \\
 951 \\
 \underline{540} \\
 4167 \\
 \underline{4167} \\
 \text{and}
 \end{array}$$

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and there will remaine 384. to ioyne with the number ouer the 3.
pricke: which done, the worke will stand in this order as you see.

Now for the third figure of the roote, I put
downe 300. and 30. as before, & against 30. at
the left hand put 23. the roote already found,
and against 300. the square thereof, which is
529. then multiplying 529. by 300. y^e Product
is 158700. which may be twice taken from
384868. therefore I put 2. in the Quotient for
the third figure of the roote, and likewise put 2. to the right hand of
300. and the square thereof which is 4. at the right hand of 30. and
the Cube thereof being 8. I put vnder 30. which numbers wil stand
as aboue; then multiplying all the numbers in
one rowe each by other, into one Product, viz.
529. by 300. makes 158700. and that againe
by 2. is 317400. for the whole product of that
rowe, which I set downe by it selfe; then I
multiply 23. by 30. is 690. and that againe by
4. is 2760. for the product of the second row.

Lastly, because 8. hath no number with it, I
put it downe vnder the other, and then adding
all the three summes together, the product is
320168. the same taken from 384868. the
number ouer the third pricke, rests for the
number ouer the last pricke, 64700224. and
in the Quotient is 232. the whole worke be-
ing as you see aboue.

Now to finde the fourth and last figure of the roote, I put downe
the two numbers againe, which serue for the Cube roote, viz. 300.
and 30. At the left hand of 30. I put 232. the number in the Quoti-
ent, and at the left hand of 300. I set the square of 232. which is
53824. in this order: When multiplying 53824. by
300. the Product is 16147200. which I seek how of-
ten may be had in 64700224. the numbers remaining ouer the
last pricke, that may be done 4. times: Therefore I put 4. in the
Quotient, for the fourth and last figure of the Root, & also I set the
said

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said 4. at the right hand of 300. and the square thereof which is 16. at the right hand of 30. and the Cube thereof being 64. I put right vnderneath 30. which done, all the numbers will stand as aboue : When multiplying all the numbers in each rowe, into their severall products, viz. 53824. by 300. makes 16147200. that againe by 4. is 64588800. which I set by it selfe : When againe 232. by 30. is 6960. the same Product by 16. makes 111360. which I put downe vnder the other.

$$\begin{array}{r}
 53824 \cdot \cdot \cdot 300 \cdot \cdot 4 \\
 232 \cdot \cdot \cdot 30 \cdot \cdot 16 \\
 64 \\
 \hline
 64588800 \\
 111360 \\
 64 \\
 \hline
 64700224 \\
 6 \cdot \\
 4384700 \\
 12551868224 \overline{) 2324}
 \end{array}$$

Lastly, because 64. hath no other number to be multiplied therewith, I put it downe likewise, vnder the other 2. numbers, and adding the 3. Products together, the whole summe thereof will be 64700224. which being subtracted from the number remaining ouer the last picke, leaues nothing : So haue I in the Quotient 2324. for the Cube roote of 12551868224. the giuen number : the whole worke whereof is here set downe in the margin. For the prooffe whereof, if you multiply the Root : viz. 2324. Cubickly in it selfe, the Product thereof will be equall with the first giuen number, as in this Example.

$$\begin{array}{r}
 4167 \\
 320168 \\
 64700224 \\
 \hline
 2324 \\
 2324 \\
 \hline
 9296 \\
 4648 \\
 6972 \\
 4648 \\
 \hline
 5400976 \\
 2324 \\
 \hline
 21603904 \\
 10801952 \\
 16202928 \\
 10801952 \\
 \hline
 12551868224
 \end{array}$$

Where you see, that 2324. the Root being multiplied into it selfe squarely, and then likewise the whole Product thereof againe by the same Roote, 2324. The totall Summe amounting therof, 12551868224. is the first giuen number.

But when you haue a number giuen to extract the Cube roote, & the aforesaid giuen number, be not a right Cube number, whereby you cannot come to any perfect root thereof, but that there will remaine some fraction or broken number after your said extraction, only the manner to extract the nearest root

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of a number not Cubicall, as most wꝛiters doe affirme, is thus :

The difference betwixt the Cubicke number of the Roote, and the Cubicke number of a number moꝛe then the roote, by an vnity, shall be the Denominator, 1. added also thereto :

As foꝛ Example : Let 12. be a number giuen, which not being a right Cube number, I would finde the nearest roote thereof. Firſt the greateſt Cubicke number in 12. is 8. the Cube roote whereof being 2. I put in the quotient, and ſubſtracting 8. the Cube thereof from 12. there will reſt 4. which 4. being ouer, ſheweth that 12. is no Cubick number : therefore adding 1. to 4. makes 5. which I put foꝛ the Numerator : and to finde the Denominator thereto, I ſet downe the Cube 2. the Roote found, which is 8. and likewiſe 27. the Cube of 3. which is a number moꝛe then the Roote by 1. then ſubſtracting the one from the other, viz. 8. from 27. leaues 19. foꝛ the Denominator : By which reaſon the nearest Cubicke roote of 12. is $\frac{5}{19}$. which being reduced, and multiplied Cubickely, makes 11. $\frac{125}{6859}$. the ſame abbreviated, makes 11. & very neere $\frac{5}{8}$. and it ſhould be 12. therefore the erroꝛ is $\frac{1}{8}$. too little, which although in this is no great erroꝛ, yet in a great ſumme the erroꝛ would be very much : Therefore foꝛ thoſe which deſire a moꝛe exact and perfect extraction of the ſquare oꝛ Cube roote from numbers not being right ſquare oꝛ Cubicke numbers : Maſter Record in his Whetſtone of wit, ſetteth downe an exact way (but being tedious) which is thus : Foꝛ the Square roote, adde to the giuen number ſo many times 2. Ciphers, as you deſire the neerenelle of the Roote : And foꝛ the Cubicke roote ſo many times 3. Ciphers, as you deſire the exactnes of the Roote thereof : and vnder the ſaid Ciphers, put prickes, in ſuch order as befoꝛe is taught : and then marke how many prickes there is ouer, and beſides the prickes of the giuen number : And then extract the roote from all thoſe Ciphers in ſuch order as you did befoꝛe : foꝛ if there be 1. moꝛe, the roote ſhall be tenths, and the remainder parts of $\frac{1}{10}$. if there be 2. pointes oꝛ prickes ouer, moꝛe then the giuen number, then the roote ſhall be hundredths, and the remainder parts of $\frac{1}{100}$. if 3. prickes be ouer, the roote ſhall be thouſands, and the remainder parts of $\frac{1}{1000}$. and ſo you may come to a very neere Roote but not to any exact oꝛ perfect Roote, vnleſſe the giuen number be a right ſquare oꝛ Cubicall number.

A Dedu-

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A Declaration of the Tables of Longitude and Latitude
of places following.

The Tables hereafter following, shewing the Longitude and Latitude of places, viz. of Kingdomes, Provinces, Citties, Isles, Capes, Bayes, Rivers, and Mountaines, especially the most principall of them in the whole world, are gathered from the latest Descriptions, Maps and Charts, as well uniuersall as perticular: who albeit they differ greatly in Longitude, yet in Latitude most of them agree: and also hauing a respect to the beginning of each of their severall Longitude, they come all to a neere agreement: For some beginning their Longitude at the Westermost part of Africa, makes the Longitude of London to be about 10. degrees 20. minutes: others beginning at the Canary Islands, makes the Longitude of London 18. degrees: others more Westward make it 19. degrees 30. min. and Iodocus Hondius beginning the Meridian at the Ile Pico one of the Azores, makes London to be in Longitude 27. degrees 40. minutes: but I following Dr. Emery Molineux, according to his great Globes, doe account the Longitude from the Westermost parts of St. Michaels, another Ile of the Azores, the midst of which Ile is 50. minutes in Longitude, and from the Westermost part thereof, the Longitude of London is 25. degrees 40. minutes, which in effect is not much different from any of the others: note that the Longitude is counted from the Meridian, passing ouer the aforesaid place Eastward into a continuall progression, to the end of 360. which is the whole Circumference of the world. Latitude is counted from the Equinociall to the end of 90. degrees on each side thereof: and where the Letter S. is after any number, it shewes the place to haue so many degrees and minutes of South Latitude: all the rest hauing no letter adioyning haue North Latit. the whole being set in Alphabetical order, for the readier finding of any place therein contained: and where the Longitude and Latitude of any Kingdome is set downe, noted by this sillable Reg. it expresseth the middle thereof. Further, at the end of such places as begin with one Letter, is left a space wherein the Traueller may insert such places wherof the Longitude and Latitude is to him knowne, and not herein exprest.

Table of the Longitude and Latitude of all the Notable places of the world.

A	Longit.	Latit.	A	Longit.	Latit.
A Berden	22 21	57 21	Algaziu	16 0	29 1
Abo	47 51	61 1	Algier	33 1	35 21
Abragina	156 1	32 41	Alguecet	63 41	26 51
Elabrigo	187 11	3 29 S	Alicante	28 41	39 1
Acapulco	276 1	18 1	Alicoa	7 41	13 21 S
Acartijan Iland	329 1	52 1	Alicur	44 21	38 29
Azores an Iland	357 1	39 1	Alima	108 51	31 1
Achaguas	101 30	5 30 S	Alleluia	70 21	10 1
Achin	132 30	4 40	Almedina	34 1	33 41
Aden	75 12	13 1	Almiria	26 11	37 21
Adia	50 11	25 1 S	Alpes a mountain	41 29	47 29
Adu	105 41	5 41 S	Alfigubas	147 11	38 41
Egypt	64 3	30 1	Amazen	45 29	12 41
Africa Reg.	40 1	10 1	Amazons Reg.	323 1	13 1
Agonata	162 21	38 1	Las Amozoni	312 29	12 29 S
Agragam	144 29	8 21 S	Ammon	59 41	27 11
Agauda	173 51	7 51 S	Amara	63 30	5 0
Aguada segura	253 29	24 1	Amara	60 10	19 20 S
Aqua la de pozos	245 20	28 0	Amsterdam	33 1	51 29
Alina a mountain	98 41	54 20	Anafi	19 15	33 0
Alacranes	283 5	22 1	Auarie a mount	116 0	54 29
Alagea	58 41	29 41 S	Ancona	63 11	1 11
Albion noua	235 1	50 0	Ancona	43 29	43 51
Albiron	109 29	25 29	Amboina	161 54	3 20
Albofera	35 21	8 1	Ambona	164 30	6 10 S
Alboram	25 29	35 29	Amiona	75 20	12 40 S
Albrough	26 25	52 20	Andernopoly	58 11	44 41
Alepo	72 29	38 1	S. Andra	170 29	12 1
Alcada	23 4	40 29	S. Andre	22 11	56 21
Alexandria	65 1	31 21	S. Andreas	62 11	61 11
Alexandria	106 11	36 21	Las anegadas	296 0	50 1 S

A	Longit.	Latit.	A B	Longit.	Latit.
Angier	24	41	Atacama	303	30
Anglesey	19	51	Atalaya	383	0
Anglia Reg.	23	0	Atalaia	291	0
Angolesme	27	1	Atalaia	27	50
Anda	66	0	Ataualo	298	10
Angolia	45	10	Athens	56	10
Angos	69	10	Auero	17	30
Angote Reg.	67	1	Augustine	293	0
Annibily Reg.	134	11	Auignon	32	40
Antiochia	72	30	Aulona	51	20
Antiochia	300	50	Ausburgh	38	40
Antipara	74	20	Ayaman Reg.	82	0
Antwerpen	31	20	Azabar	75	30
Apiamia	61	30	Azamor	18	30
Aqua lega	86	40	Azafy	17	15
Ara	14	20	Azura a mountain	59	0
Arabia felix	83	0	Azzell	62	40
Arabia desert	77	0	Amiens	28	30
Aracam Reg.	132	0	Arago	26	0
Arboledas	272	30			
Ardaguy	136	20	B		
Aren	76	10	B Antam	140	0
Argell	84	30	Babilon	82	20
Arglas	16	30	Babell mandell	80	0
Armenia Reg.	76	0	Bachu	88	50
Arnoltus mount	35	0	Bachnapa	72	0
Ascention	353	20	Bactriana Reg.	115	0
La ascention	15	30	Badaios	19	40
Ascention	290	30	Bafar	52	20
Asia Reg.	130	0	Bagafus a lake	77	10
Asmery mount	137	0	Baharam an Ile	87	20
Aspefa	52	15	Bayes		
Aspeza mount	100	0	Bayanegada	319	50
Afiria Reg.	85	0	Bay de baxos ane-	321	30
Aftapus fluii	64	0	gados.		
Asuga	66	40	Bianza	149	25
			Batauia	123	0

B	Longit.	Latit.		B	Longit.	Latit.
Buena baya	190	20	4 40 S	Belisse	21	40 47 0
Bay de los condos	320	20	43 0	Belt	52	30 50 0
Bay a dalagoa	56	10	32 10 S	Bengala Reg.	126	0 26 30
Bay de fumos	240	20	36 0	Benichao	136	0 3 50
Bay de gent grand	303	0	54 0 S	Benin Reg.	41	0 7 40
Bay Hermosa	54	20	32 40 S	Bepirus a mount.	143	0 34 0
Bay S. Iohan	309	40	40 30	Bepirus a ruer	138	20 34 0
Bay de S. Migell	39	30	8 40 S	Berga	40	10 62 50
Bay Ocfinora	312	30	41 0	Bergen	30	30 60 50
Bay de pinos	233	0	44 30	Barwicke	22	50 55 50
Bay langos	18	0	37 30	Bethle	138	50 25 40
Bay de saluadeges	344	0	20 0 S	Baifer Reg.	50	0 4 0
Bay de S. Sebastia	83	20	13 20 S	Braligrod	58	20 47 30
Bacalaio	335	4	48 28	Bilbao	23	30 43 0
Bay da Reg.	126	0	65 0	Blaskey	12	0 51 40
Bayona	17	20	42 10	Blaues	31	10 42 0
Bayone	25	30	44 0	Blauet	21	15 47 50
Balgada	69	30	5 0	Bloc	5	30 67 0
Balsera	82	40	31 10	Borneo	131	30 5 10
Bamberg	39	15	50 10	Borutholme	40	50 55 30
Banda	162	0	4 50 S	Bouenbergen	34	20 56 30
Bandu	173	30	33 0	Brandenberg	42	30 52 50
Bax de los pergos	345	30	20 0 S	Brafill	5	10 51 20
Bianza	150	0	2 50 S	Brafilia Reg.	345	0 10 0 S
Barbada	320	50	19 50	Braua	74	30 0 30
La Barbada	192	50	1 50 S	Brest	20	0 48 30
Barbados	210	10	8 50	Brest	331	0 53 0
Barlingas	16	20	39 30	Bruage	25	30 45 50
Barnagasso Reg.	70	0	13 0	Bruges	29	0 51 10
S. Bartholome	194	30	14 0	Buda	48	0 47 20
Basell	37	10	47 50	Burdeaux	26	0 45 10
Beciasa	65	0	10 30	Brittow	22	50 51 35
Becolicus a mount	56	0	26 30	Brachipult point in Wales	21	25 53 0
Beil	76	15	27 10	Backapta	31	0 59 50
Belef	69	0	51 40	Brussels	30	50 51 0
Belle Ile	334	0	52 20			

C	Longit.	Latit.	C	Longit.	Latit.
Barcelona	28	15 41 10	Cap de fierro	28	21 29 21
Burlings	16	0 39 38	Cap de sperance	32	29 51 1
C			Cap de s.domingo	31	21 46 41 S
Capes,			Cap falso	41	31 34 40 S
Cape S.Francis	335	0 48 5	Cape feare	30	5 11 32 29
Cap de Espera	335	5 47 0	Cape felix	84	29 14 11
Cape Raso	334	40 46 28	Cap finis Terre	16	1 43 11
Cape Massifaco	24	0 43 32	Cap Florida	29	3 21 25 29
Cape de las penes	21	0 43 35	Cap formoso	28	1 5 1 S
Cape de Alinde	346	50 1 0	Cap froward	30	2 39 53 21
Cape del Amber	85	30 12 0 S	Cap de gato	26	39 36 51 S
Cape de S.Anton	289	15 22 50 S	Cap de S.Helena	32	6 11 36 11
Cape Cleare	14	10 51 9	Cap de santiago	30	9 1 37 29
Cape de S.Antoni	74	30 17 0 S	Cap S.Iohn	62	29 67 29
Cape de S.August	162	0 6 30	Cap.de Krin	13	1 53 41
Cape de S.August	354	0 8 30 S	Cap de S.Maria	77	29 24 1 S
Cape baxo	328	0 4 20	Cap de Malo	82	52 15 51 S
Cape de las baxas	19	41 15 29	Cap de S.Maria	32	7 11 35 11 S
Cape Bedford	320	1 65 29	Cap de S.Maria	9	41 21 41
Cape blanco	273	19 25 21	Cap de la mola	36	51 6 29
Cape blanco	281	19 10 29 S	Capo de nombre	30	8 11 53 1
Cape blanco	330	11 1 1	de Iesus		
Cape blanco	331	21 4 29	Cap Ortegall	18	29 44 11
Cape blanco	334	21 52 1	Cap de palmas	34	8 11 1 19 S
Cape blanco	9	20 20 29	Cap S.Paul	32	0 5 50
Cape blanco	289	41 2 21 S	Cap de pescadores	27	7 40 28 0
Cape blanco	151	1 22 41	Cap del plate	35	2 50 5 0 S
Cape braua	275	1 27 29	Cap primero	42	30 2 20 S
Cape de breton	331	1 45 41	Cap de 3.pointes	28	30 50 20
Cape cameron	287	21 25 41	Cap de puntas	31	5 20 10 40
Cape comorin	115	15 7 30	Cap daguilius	42	15 34 30
Cape cantin	17	1 32 11	Cap de Razo	33	4 30 16 20
Cap de S.Catherin	41	1 1 1 S	Cap salida	74	0 26 10 S
Cap de cro	31	29 42 11	Cap de spigiel	35	3 20 7 20 S
Cap croce	65	21 48 21	Cap de stauola	12	20 54 0
			Cape Toriga	11	30 18 20

C	Longit.	Latit.		C	Longit.	Latit.
Cap de las vacas	53	0	33 40 S	Chiguifamba	305 30	17 0 S
Cap la vela	305	10	11 50	Cirut	62 40	15 30 S
Cap S. Vincent	302	20	53 40 S	Coale	65 0	21 30
Cap de virgin Ma.	308	0	52 10 S	Coila	48 20	3 10 S
Cap de vittoria	297	30	52 0 S	Cora	85 10	19 20
Cap passaro	46	29	36 51	Coronades	295 30	45 0 S
Cap refalgate	96	21	22 21	Corongo	302 40	14 20 S
Cap raso	317	41	8 0	Corpo santo	84 10	7 30 S
Cap roxent	16	29	18 51	Cumana	313 30	7 0
Cap roxo	11	1	12 0	Cusco Reg.	297 20	13 30 S
Cap of good hope	39	29	34 40 S	Cales in Spaine	20 51	36 10
Cap del spirito san	161	11	13 11	Cambalu	161 11	51 40
Cap S. Vincent	17	0	37 0	Cana	68 1	25 40
Cap Verd	9	51	14 20	Canada	305 11	50 21
Cap de bona vista	334	21	49 11	Canaria	9 29	27 21
Cap Walsingham	321	1	63 41	Candia	59 29	35 21
Camdn Reg.	136	1	47 0	Caraiam Reg.	136 51	41 0
Cairo	67	29	30 0	Caribanum Reg.	310 1	5 0
Calamita	67	41	48 10	Caribes	316 11	7 0
Caldy	20	1	51 40	Cartagena	300 1	11 20
Calecut	112	41	10 29	Cartagena	28 21	38 20
Callice in France	29	10	50 40	Cartago	299 29	3 11
Calibia Reg.	42	10	36 20	Casena Reg.	38 21	17 11
California	245	0	30 0	Cassar Reg.	132 1	47 1
Camanor	300	20	16 30 S	Cataio Reg.	150 1	53 1
Cambaba	150	0	8 10 S	Catnes	22 9	58 29
Cambaya	102	0	22 28	Catwicke	41 11	69 11
Camboya Reg.	142	20	11 40	Ceris	87 51	38 41
Capiapa	304	50	34 0 S	Chefimur Reg.	115 0	29 0
Casma a riuer	121	40	61 0	Chester in Englād	21 29	53 51
Castrum portugal	57	10	20 20 S	Chichester	24 11	51 0
Cazan	86	20	56 30	Chidlies cape	326 41	67 29
Chaga	56	0	6 20 S	Chily Reg.	305 0	30 1 S
Chialo	56	20	7 0 S	Chirman Reg.	96 0	26 29
Chilimazata	294	30	6 30 S	Ciartiam Reg.	136 29	51 1
Chio	58	30	40 30	Cinua	67 1	41 21

C D	Longit.	Latit.	D E	Longit.	Latit.
Cirena	53 29	32 0	Dantzicke	46 0	55 0
Ciprus	68 40	37 30	L. Darcies Ile	327 51	68 21
Clearmont	30 55	45 51	Delly Reg.	114 0	18 29
Cocas a mountain	79 0	47 29	Derwinda	47 51	57 29
Cochin	114 0	9 14	Deuenter	33 25	51 51
Collao Reg.	310 0	16 0 S	Diep	28 41	49 29
Colmogory	62 41	63 41	Dires cape	321 29	64 51
Colne	34 0	51 41	Dominica	319 41	14 0
Commania Reg.	86 0	51 0	Don a riuer	75 0	53 21
Congu	147 21	49 11	Donecz a riuer	71 0	51 0
Coninxberg	49 11	55 29	Dorow	58 0	51 29
Constantinople	61 10	44 40	Douer	28 11	51 0
Copenhage	38 29	55 51	Drongenes	4 29	66 29
Corafau Reg.	108 1	37 0	Drin	50 0	45 0
Corke in Ireland	15 41	51 41	Dubdu	25 0	32 51
Corfu an Iland	22 0	39 29	Dubino	35 21	54 0
Corinth	54 21	39 0	Dublin	16 41	53 11
Corfica	38 11	42 0	Dumarau	150 0	8 41
Cotum Reg.	130 0	51 0	Duy	34 29	59 21
Cracow	48 29	50 0	Duyhe	56 29	50 29
Cuba	296 0	31 41	Dams straights	324 1	64 0
Earle of Cumber-lands Iles.	316 0	63 21	Darby	24 5	52 55
Cusitan Reg.	87 0	32 0	Dunkerke	29 10	51 12
Conough	15 35	53 45			
Cambridge	25 50	52 14			
			E		
D			E Baida	60 1	25 29
D Angali Reg.	78 0	11 0	Ecfonen	30 15	58 11
Diu	97 3	20 42	Edenbrough	22 1	55 51
Damon	98 8	19 20	Elgent	80 0	17 20
Dabul	98 6	17 45	Ely	25 20	52 40
Dwina	74 30	62 10	Eliobou	72 0	27 0
Dageroort	48 41	59 41	Elior	26 20	10 10
Dalacia	77 0	14 21	Queen Eliz. baths	337 0	61 30
Damascus	74 29	33 0	forland.		

E F	Longit.	Latit.	E G	Longit.	Latit.
Emden	34 10	53 10	Forteuentura	11 0	28 0
Ens	43 0	48 30	Foyl	15 50	55 30
Ens	74 10	37 30	Frayles	314 30	11 20
Ephesus	60 30	39 40	Franckfort	36 30	50 0
Ergas	86 0	38 0	Frisland	351 30	62 0
Ergimul	45 0	59 0	Frobishers stay	331 20	64 0
Euboya	56 10	41 0	A furious ouerfall	322 30	60 0
Euphrates	76 40	40 0	Farre Ilands	20 0	62 10
Europa Reg.	55 0	51 0	Farhill Ile	24 45	60 0
Exeter	22 10	50 0	Ferando	146 0	32 35
Enchuisen	21 40	52 54			
F			G		
F Alckzin	57 20	47 0	G Ago Reg.	25 0	8 30
Falsterhode	40 0	56 0	Galathia	37 20	37 0
Famagosta	69 20	57 30	Gambra a riuer	12 0	13 10
Farrollones	294 20	11 40 S	Gane	30 20	50 40
Fargana	114 40	46 0	Garamantica	51 30	16 0
Farre	16 20	61 30	Garnesey	22 20	49 40
Cape fatache	86 50	15 40	Gaza	70 50	33 10
Faso	75 50	45 40	Gamba	64 40	17 30 S
Farnasa	38 10	30 10	Gargiza	72 40	12 0 S
Fayll	356 0	38 40	Gemanacota	118 40	6 0
Fernandobuck	351 40	9 20 S	Geneua	33 40	46 20
Fees Reg.	21 50	32 50	Genua	37 50	45 0
Fierro	6 20	26 30	Genua	15 20	16 0
Finmarke	47 0	69 30	Gerguth Reg.	153 0	57 0
Flambroughead	20 54	0	Germanarco	40 0	51 0
Flensburgh	36 40	55 0	Getseluin	24 30	32 20
Fleccory	32 0	58 0	Gestreg	106 30	26 0
Flye	32 0	53 33	Genera	7 30	26 30
Florence	41 10	43 40	Ghir a riuer	25 30	22 0
Flores Iland	353 40	39 20	Ghir a desert	24 0	22 0
Florida Reg.	292 0	31 0	Giamber	18 1	33 41
Flöcen	38 40	46 30	Gilan	94 1	39 21
La formanos	310 30	60 40	Gilberts found	326 51	67 1
Formentera	31 10	38 50	Giras a riuer	41 21	20 11

G	Longit.	Latit.	H I	Longit.	Latit.
Galloway	15 49	53 15	H		
Goa	102 21	15 41	[H] Ales Iland	337 51	63 0
Godia	22 30	18 11	Haliber	78 41	21 10
Glosgow	29 0	57 0	Hallicz	52 51	48 41
Golfo de benngal	125 0	15 0	Hambrough	37 11	53 21
Golfo de S. Helen	48 41	33 29 S	Hartlepoole	24 0	55 21
Golfo de la India	44 21	3 41 S	Harwich	27 29	52 0
Golfo de los negi	350 30	2 0 S	Hauana	292 11	20 0
Golfo del Rey	40 41	5 30 S	Hebrides	15 20	58 0
Golfo de todos Santos	345 30	1 41	Heydelberg	36 0	49 0
Golfo de S. Anton	46 20	26 0 S	Heift	23 29	46 29
Golfo frio	45 30	20 0 S	Heishant	19 29	48 41
Golfo del papagai	278 30	12 30	Heptapolis	324 29	25 21
Gorage Reg.	69 0	2 0	Hercules pillars	69 21	32 11
Goram	58 15	28 30	Helichland	33 51	66 0
Goteland	45 21	57 30	Hercania Reg.	100 0	40 0
Gozo	58 20	34 41	Hispanio Reg.	25 0	40 0
Granda	318 20	11 0	Noua Hispanio	280 0	13 29
Granata	23 30	38 0	Hispaniola	306 0	18 29
Grecia Reg.	54 0	40 0	Holindall	36 11	51 1
Gratiosa	357 30	39 2	Homey	61 30	52 51
Groninghen	32 11	53 0	Hontfoort	48 30	59 1
Groenland	0 0	75 0	Horne	12 10	66 10
Groy	21 0	47 21	Hull	25 21	53 41
Guber Reg.	27 0	9 0	Hungaria	50 0	48 1
Guangera Reg.	44 0	13 41	Hidaspes a riuert	124 0	33 21
Gudan	48 21	8 51	Hipafis a riuert	124 0	33 1
Guinea noua	80 0	5 0	Helin head	15 2	55 15
Guinea Reg.	18 0	9 0 S	Hereford	12 38	52 12
Guly	33 30	50 41	Heel of Danthicke	46 10	55 40
Gunagona	67 30	6 0	I		
Gustina	109 30	56 11	[H] Ambie	121 30	1 15 S
Gibraltar straights	21 30	35 2	Iacatra	123 24	6 0 S
			Iapara	127 0	6 30 S
			Iamaica	238 29	7 1
			Iasques in Persia	44 0	25 40

I	Longit.	Latit.	I	Longit.	Latit.
Iambut	72	20	26	29	
Iorchem Reg.	117	29	44	1	
Iapones	169	0	3	1	S
Iarsey Iland	23	0	49	20	S
Iaua maior	140	0	9	0	
Iaua minor	150	0	9	0	
Iazin	77	30	20	30	
Iapara	141	20	7	40	
Ierico	73	1	33	0	
Ierusalem	72	21	33	0	
Ilmens a riuier	105	0	27	0	
Imaus a moun- taine	128	0	39	0	
India Orientall	135	0	26	0	
Indus a riuier	115	29	26	0	
Inspurg Ilands	40	41	47	50	
The three Ilands	169	21	40	9	
Ile d'eaues	310	30	11	20	
Ile de eaues	173	50	4	30	
Ile de bastinado	293	30	10	30	
Ilebraua	1	20	12	20	
Islas de corales	194	40	9	50	
Ile desierto	178	0	31	1	
Ile del fuego	22		14	21	
Ile de los fuegos	181	29	22	41	
Ile de los Galope- gos maiores.	281	10	4	0	
Ile de los Galope- gos menores	277	30	1	10	S
Ile de Hombres blancos	169	20	5	41	
Ile de S. Iago	158	20	8	1	
Ile de S. Iuan	325	29	42	30	
Ile de los Ladro- nes	177	21	15	11	
Ile de los Lobos	307	41	40	21	
Ile de S. Maria	296	29	37	2	
Ile de martin vaz	10	41	21	1	S
Ile de May	4	29	13	29	
Ile S. Michael	0	0	29	29	
Ile de Negros	155	29	10	29	
Iland of Fowles	33	40	50	0	
Ile de Orliance	31	0	50	29	
Ile de Paiaros	314	0	12	41	
Ile de palmas	163	21	6	0	
Ile de Paxaros	198	51	8	51	
Ile de Paxaros	234	21	28	0	
Ile de Pearles	203	11	7	0	
Ile de Pinos	292	21	21	29	
Ile de Rees	1	20	25	21	
Ile of Salt	411		16	29	
Salomon Iland	204	40	10	0	
Ile of the Sunne	547	41	10	29	
Ile S. Thomæ	38	0	0	0	
Ile S. Thomas	252	0	20	11	
Ile de Verde	353	51	45	29	
Ile de S. Vincent	175	50	8	0	
Ile de S. Vincent	73	21	20	29	
Ile de S. Catalina	334	10	27	30	S
Ile de Cedros	240	30	29	50	S
Ile de Farnan. Iaro	354	20	2	20	
Ile de lima	295	10	22	0	S
Ile secas	46	20	29	30	S
Ile de Tristan de Acunia	26	30	36	0	S
Ioam	135	0	7	29	
Iolofo Reg.	24	29	6	0	
Ipswich	27	12	52	22	
Ioppe	71	21	4	0	
Isabella	305	21	18	51	
Iland	8	0	66	0	
Italy Reg.	42	29	43	0	

I K L	(Longit.)	(Latit.)	L	(Longit.)	(Latit.)
Ireland	16	0 53 29	Laia	45	29 64 10
Iucatan Reg.	28	30 18 0	Lampesa	36	21 33 0
Iugor	138	0 7 50	Lancarroca	11	41 29 30
Iuica	31	21 39 30	Lanow	51	11 52 20
Iulibella	61	0 1 30	Laredo	22	51 43 0
			Lariffa	70	0 33 0
			Larta	53	0 46 0
			Lake de Gouleme	306	40 48 0
			Lacus Armibus	131	0 60 10
			Lacus falsus	137	40 47 30
			Lecknes	23	29 58 0
			Leon	21	11 42 15
			Leon	283	41 11 21
			Leopolis	52	51 49 2
			Lepin	98	0 58 41
			Leguio maior	165	0 28 0
			Leguio minor	158	41 22 0
			Lerida	28	21 41 30
			Lester point	335	0 62 0
			Lima	296	41 23 30
			Limonia	72	11 44 20
			Limofa	43	29 4 50
			Lyons	32	41 45 40
			Lyorne	40	21 43 30
			Lisboa	17	29 39 11
			Lyzard	18	30 50 10
			London	25	50 51 40
			London coast	326	11 72 0
			Lepeso	74	1 49 41
			Loyre a riuier	24	41 47 41
			Longfound	34	30 58 55
			Lubecke	38	2 53 51
			Lucka	42	11 52 0
			Luky	64	0 58 21
			L. Lumleys Inlet	320	0 61 0
K					
K Almuchy in Tartaria	9	5 51 0			
Kaniow	93	40 51 10			
Karakithath Reg.	119	0 51 0			
Kartzef	67	20 53 0			
Kargapele	166	30 61 50			
Kafakky Tartaria	103	0 51 0			
Kiow	62	20 51 10			
Kithais Reg.	110	0 57 0			
Kithay a Lake	123	31 53 0			
Kola	54	51 69 0			
Kolenig	4	11 65 10			
Kofar a riuier	96	40 49 0			
Kintaile	19	39 56 45			
Kinfaile	15	3 52 35			
L					
L Acierna	24	50 39 30			
Ladena	53	30 41 31			
Ladoga	62	11 61 40			
Lago de los coronados	295	1 44 0			

M	Longit.	Latit.	N	Longit.	Latit.
Medino	98 29	36 29	Minas	165 0	36 20
Middleburgh	29 40	52 0	Moseenek	69 50	51 30
Meiffen	41 0	51 10	Munster	35 0	52 10
Melinde Reg.	71 21	3 20 S	N		
Melley Reg.	15 41	12 0	N Abarz	79 50	50 50
Meluing	48 1	54 50	Naygay in	97 0	53 30
Ments	35 51	50 0	Tartar		
Meshet	85 29	52 50	Naym	94 10	33 40
Mesopotamia	78 1	35 0	Nayman Reg.	140 0	64 0
Messana	45 51	37 50	Naynen	31 10	50 0
Metz	33 29	49 45	Nantes	24 10	47 50
Mien Reg.	136 1	31 0	Napoly	45 0	41 0
Miens kow	56 41	54 50	Napoly	55 10	38 0
Millaine	38 29	46 10	Napthaly	73 0	34 30
Minorca Ile	34 29	40 0	Narbona	30 20	43 20
Moguer	20 0	37 50	Nardenborg	47 10	67 50
Moldauia Reg.	55 0	46 0	Narue	56 10	60 0
Molines	30 21	47 40	Naruare	21 55	42 39
Mollucca Ilands	160 41	1 0	Naseph	110 30	43 0
Memorancie	130 0	47 0	Natolia Reg.	66 0	41 0
Momphehier	31 29	44 10	Nazareth	72 40	34 10
Mongull Reg.	160 0	61 30	Nerpis	45 30	62 50
Monte de branid	47 11	30 15 S	Neunox	57 0	64 20
Mont frogoso	44 0	12 0	Newcastle	23 10	55 20
Mont negro	44 41	17 0	Nicareia	59 30	39 30
Mont raleigh	20 20	65 0	Nicober an Iland	130 30	6 40
Mont royall	301 0	45 40	Nicomedia	63 30	44 20
Morea Reg.	54 30	38 0	Nicopolis	56 30	45 0
Mosaik	68 50	55 0	Nieflot	57 40	59 50
Mofambique Reg	70 20	14 40	Nilus a riuer	67 20	32 0
Muscouia Reg.	80 0	59 0	Ninus	82 20	37 0
Moskow	70 30	55 40	Nifa	36 10	44 0
Mossa	84 30	35 0	Niffa	45 30	50 30
Mosull	84 0	34 55	Naze in Norway	31 0	58 5
Mozena	24 20	34 30	Noes a mountain	81 0	40 21
Moa	96 36	21 31	Nolon	30 0	40 22

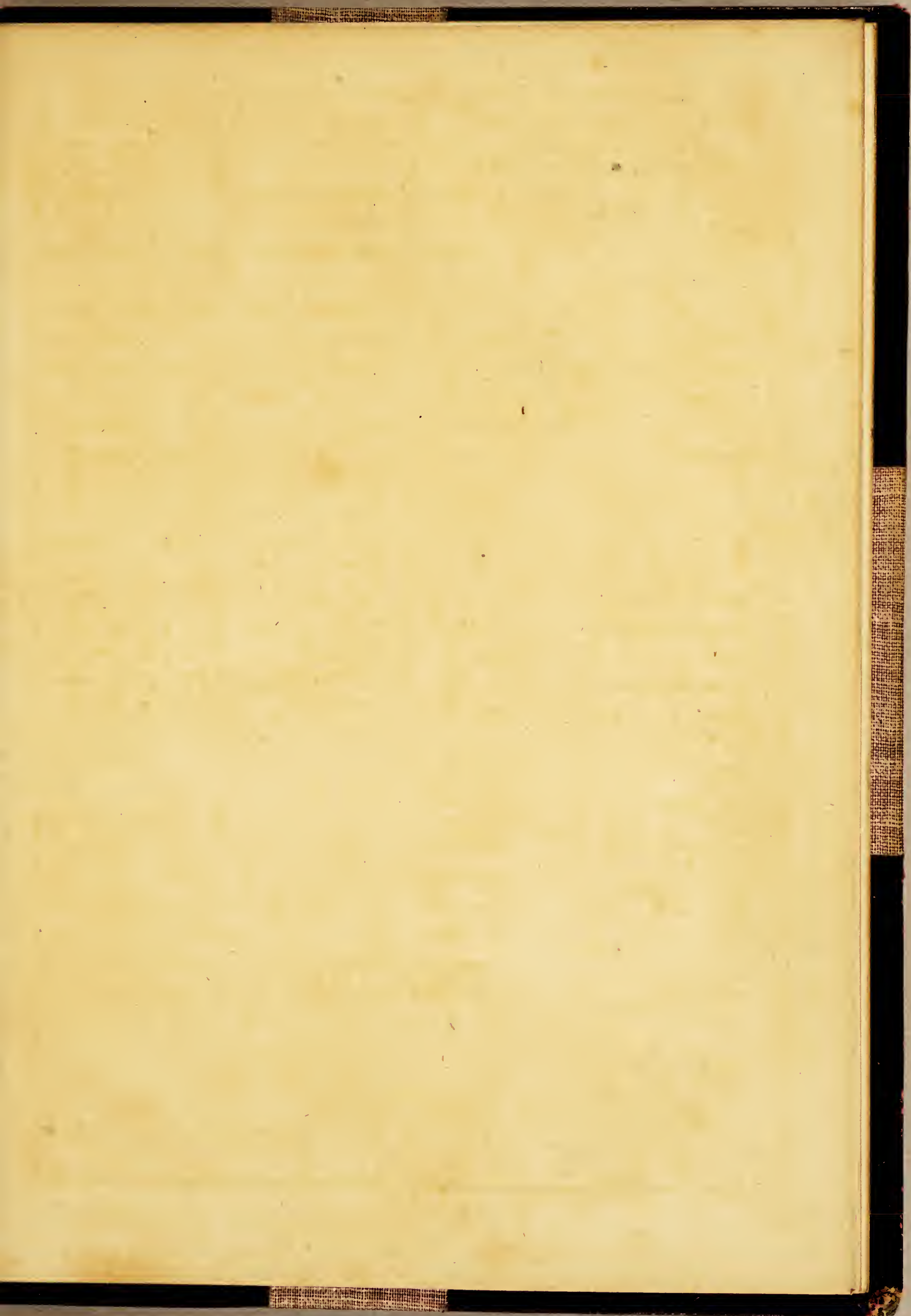
P	Longit.	Latit.	P	Q	R	Longit.	Latit.
Pico	356	41 38 21	Preflaw			45 11	51 11
Picora Reg.	317	0 10 2 S	Preflaw			49 41	49 45
Pigmea	148	41 32 2	Portland			22 40	50 40
Pinisko	55	0 52 2	Primsberg			48 30	55 11
Pilingu	144	21 40 2	Prussia Reg.			50 0	54 0
Pina	296	21 3 1	Ptolamais			66 41	29 40
Pinegle	131	21 52 29	Punto de S. Helen			290 11	2 11 S
Pinego	61	11 64 29	Punto de S. Helen			325 21	37 30 S
Pinga	101	40 14 20 S	Punt de S. Lucas			252 29	23 29
Port de los leenes	318		Pria man			118 0	0 20 S
Piramides	173	11 20 21					
Pisa	40	29 43 41	Q				
Pizan	73	0 51 29	Q Vanzu			157 29	44 10
Plata	315	0 19 51 S	Quelinfu			158 29	36 1
Plimouth	21	11 50 51	Quianfu			144 41	42 29
Ploosko	48	11 52 41	Quiloa Reg.			69 51	8 51
Plotzko	57	29 57 41	Quinzay			153 0	40 1
Podolia Reg.	59	0 49 29	Quito			293 11	0 11
Poictiers	26	29 47 21	Quiuira			233 0	43 40
Poldavid	20	5 47 55					
Polonia Reg.	53	1 50 0 S	R				
Poparopo an Ilan.	128	41 16 29	R Agusy			49 29	44 1
Buen porto	177	21 2 0	Rameles			68 29	30 30
Port de canoas	239	21 36 41	Rane			352 41	62 41
Port de caualos	283	0 14 21	Rauenna			42 21	44 21
Port de la conce	45	41 4 21 S	Rhodes			61 41	37 21
Port desire	313	0 47 41 S	Ryaurech			94 41	40 0
Port famin.	302	51 53 11 S	Ribadeo			19 21	43 21
Port fremo.	44	0 4 0 S	Riga			53 30	58 0
Port del gado	42	11 3 51	Reins			30 35	49 12
Port de S. Miguell	240	29 35 2	Riuers				
Port de Negrillo	296	51 17 11	Rio de arboledas			331 41	1 41
Port fallido	186	41 3 0 S	Rio de S. August.			350 0	15 30 S
Port sancto	10	0 32 29	Rio de S. Barbara			326 41	34 1
Port S. Vincent	337	21 23 51	Rio del Brasill			348 21	17 11
Praga	42	29 50 0	Rio de los cama- rones			42 0	5 25

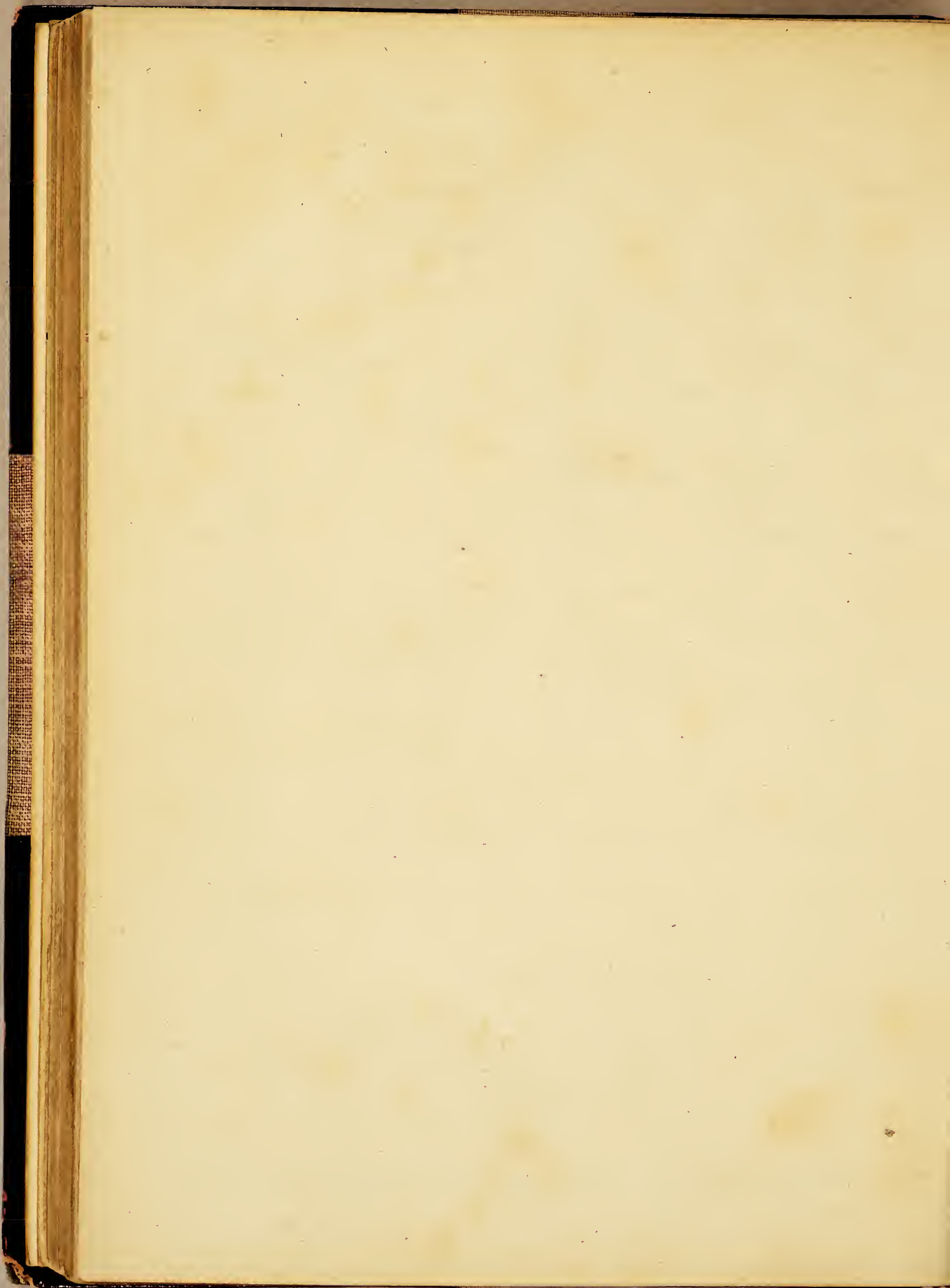
R	Longit.	Latit.	S	Longit.	Latit.
Rio de camaron	315	0 44 29	S	Sabarza	154 51 45 0
Rio del campo	42 29	2 51		Sablestan Reg.	114 0 34 0
Rio de cano	298 41	33 11		Sabron	84 51 45 11
Rio dangla	42 29	0 41		Saendeban	174 41 35 51
Rio dulce	316 29	52 0		Sagatin	95 29 58 21
Rio de S.demingo	353 0	7 51		Sala	49 41 48 0
Rio del estremo	340 41	22 59	S	Salamanca	20 29 40 51
Rio de Flores	287 19	29 0	S	Salasta	72 41 41 51
Rio del gado	34 21	6 21		Salabrema	24 51 37 29
Rio de gigantes	278 29	29 0		Salina	45 0 38 29
Rio grande	301 11	11 0		Salsburg	42 0 48 21
Rio grande	314 29	44 0		Salstom	32 21 62 0
Rio del guato	284 29	29 29		Saluado	321 21 5 0
Rio de la hacha	304 15	10 41		Samarchant	109 0 44 0
Rio de S.Helena	348 41	10 29	S	Samaria	72 21 47 41
S.Laurence Riuer	318 51	53 0		Sanderfons Tow.	320 0 55 29
Rio de manicong	48 21	10 0	S	Hope Sanderson	326 21 72 41
Rio del oro	10 21	22 29		Sandry	162 51 53 0
Rio de palmas	272 11	14 21		Sanfon	20 41 43 21
Rio panuco	271 51	22 29		S. Cruz	334 21 43 29
Rio de perla	292 29	29 0		S.Davids	20 0 52 0
Rio de la plata	326 29	36 0		S.Domingo	307 11 17 51
Rio primero	327 41	45 0		S.George	357 11 39 0
Rio sancto	300 29	3 0	S	S.Helena	54 29 13 0 S
Rio de spirito san.	381 29	31 0		Santiago	264 29 20 29
The white Riuer	308 11	51 21	S	Santiago	298 11 32 11
Rypon	35 29	55 21		S.Jago	175 29 2 0
Rgan	27 41	48 51		S.Iohn de luz	25 11 43 21
Rochell	25 29	46 41		S. Lazaro	71 0 11 21 S
Romey	42 29	42 0		S.Lucar	21 21 37 11
Rooswicks	40 21	54 0		S.Lucia	0 1 17 0
Rostone	72 11	57 0		S.Malo	24 21 48 50
Russia	57 29	59 29		S.Maria	82 29 17 0 S
Rye	27 29	51 1		S.Maria	240 41 34 21
Rio de senega	14 25	15 6		S.Maria	0 19 56 0
				S.Maries	85 1 44 29

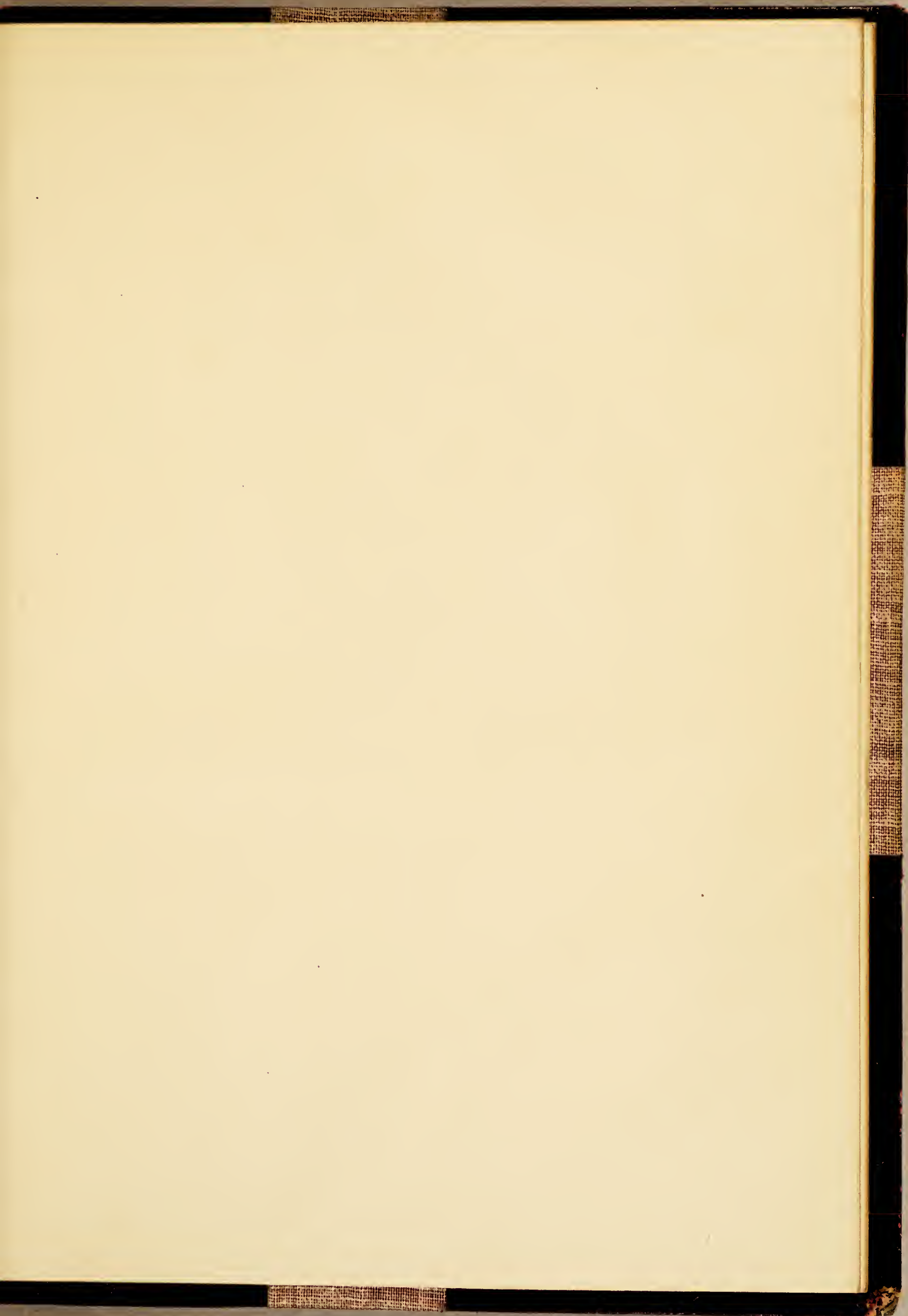
S	Longit.	Latit.		S	Longit.	Latit.
S. Maries of Naza	66	30	16	29	Skalholt	8 30 65 20
S. Martha	301	21	10	41	Sibier Reg.	99 20 59 30
S. Martin	321	11	51	0	Sicilia	45 0 37 30
S. Martins Iland	293	40	46	51 S	Sidon	72 10 36 30
S. Mathewes	21	11	1	51 S	Simiso	69 10 44 21
S. Michell	60	50	65	29	Siam	140 0 13 49
S. Michael	0	50	38	5	Sina a mountaine	75 0 20 0
S. Miguel	327	21	47	21	Sinus mexico	280 0 26 0
S. Miguel	291	41	9	11 S	Sinus persia	85 0 29 0
S. Miguel	268	0	24	0	Sion	59 10 12 40
S. miguel	249	0	32	51	Sipanto	45 30 41 50
S. Nicholas	69	0	54	0	Siuill	18 6 37 45
S. Nicholas	323	21	53	41	Slaba	55 50 58 41
S. Nicholas	2	2	17	0	Slauonia	47 0 45 0
S. Petro	64	29	0	29	Slego in Ireland	15 35 54 15
S. Pol de Lyon	20	41	48	48	Slowoda	68 20 64 30
S. Sampson	306	29	40	29	Slowoda	86 30 58 51
S. Vincent	0	29	17	29	Slutzk	59 0 52 58
S. Vincent	318	41	11	51	Smirna	60 21 40 29
Sapom Iland	107	11	0	29	Snauell	2 30 64 21
Sarachy	84	29	44	11	Sorlings	18 0 50 0
Saragofa	26	11	41	51	Spacado	46 50 45 21
Sardinia	39	0	40	0	Spier	35 30 49 21
Satyres Iland	174	11	46	30	Spina	60 50 43 29
Sauatapoly	75	29	47	21	Stad	30 40 61 41
Scarborough	34	51	54	51	Stapholt	2 20 65 41
Schotland	25	0	60	0	Stetin	42 10 53 51
Scotland	20	0	57	0	Stoby	52 30 44 0
Segedin	49	0	47	11	Stocholme	42 0 58 11
Seames	19	29	48	21	Straights of Tu-	74 30 73 11
Senega Reg.	13	0	24	0	machin	
Sernety Reg.	106	29	33	29	Seuedia Reg.	40 0 60 0
Shabolisher	83	41	56	29	Sumatra an Iland	134 0 0 0
Shahaskik	91	29	53	0	Soor	84 45 23 5
Shrewsbury	22	35	52	55	Surrat	99 24 21 7
Sierra leona	19	8	8	40	Swallywad	99 32 21 25

S T	Longit.	Latit.	T	Longit.	Latit.
Saldania Bay	39 45	33 40	Theffalonia	53 44	44 21
Silly	18 0	5 70	Texell in Holland	31 0	53 15
Stert	22 50	50 40	Tholomon	144 20	40 0
Swest	64 51	52 11	Tholouse	28 40	43 50
Swineburne head	25 0	59 51	Thunnis	67 40	32 0
Syria	74 0	39 0	Tygris a riuer	84 0	34 30
Siracusæ	45 41	37 0	Tocros	54 50	46 0
Southampton	24 5	51 11	Togora	146 0	49 50
T			Tolledo	22 20	39 40
Abaco	322 11	10 41	Tollon	34 5	43 20
Tacan	152 21	48 51	Toul	33 10	49 10
Tagaranto	143 29	2 21	Toures	27 30	47 50
Taguina an Iland	154 29	5 21	Trebifonde	74 30	44 40
Taiona	59 29	53 29	Trent	40 10	26 10
Talabora	312 0	26 21 S	Triago an Iland	278 40	21 0
Talcan	85 0	47 0	Tribanta	63 30	41 50
Tamasa	75 39	46 0	Trin	36 30	45 40
Taranto	48 0	40 29	Trinidad	355 20	19 10 S
Tarapaca	306 21	30 41 S	Trinidad	295 50	21 20
Tarbacan	109 29	34 51	Trinidad	319 20	9 0
Targa Reg.	32 0	25 0	Trinty harbor	308 30	36 0
Taragona	29 29	40 41	Tripolis antiqua	44 21	30 20
Tarso	71 21	40 0	Tripolis in Barba.	45 21	30 30
Tartar	152 0	63 21	Tripolis foria	72 21	37 0
Tartaria Reg.	130 0	62 0	Troia	59 0	42 30
Tasken Reg.	129 0	49 0	Troy	31 0	48 10
Tatracan	55 0	44 51	Tuia	82 51	52 0
Tecou	116 29	41 S	Tulla	72 0	53 20
Tenariffe	8 11	27 29	Tuna	41 51	64 30
Tendue Reg.	170 0	59 0	Turfon	131 30	56 30
Tenesab	46 41	61 11	Tyrus	71 35	35 30
Terceta	358 23	39 0	Tzeroas	79 50	49 20
Terra alta	160 29	6 51 S	Talao	159 0	3 30
Terra alta	45 21	15 21	Ternate	160 12	0 30
Ter de los fumos	322 29	40 21 S	Tidore	160 15	0 10
Tharsis	115 21	49 0	Timor	139 12	10 26 S

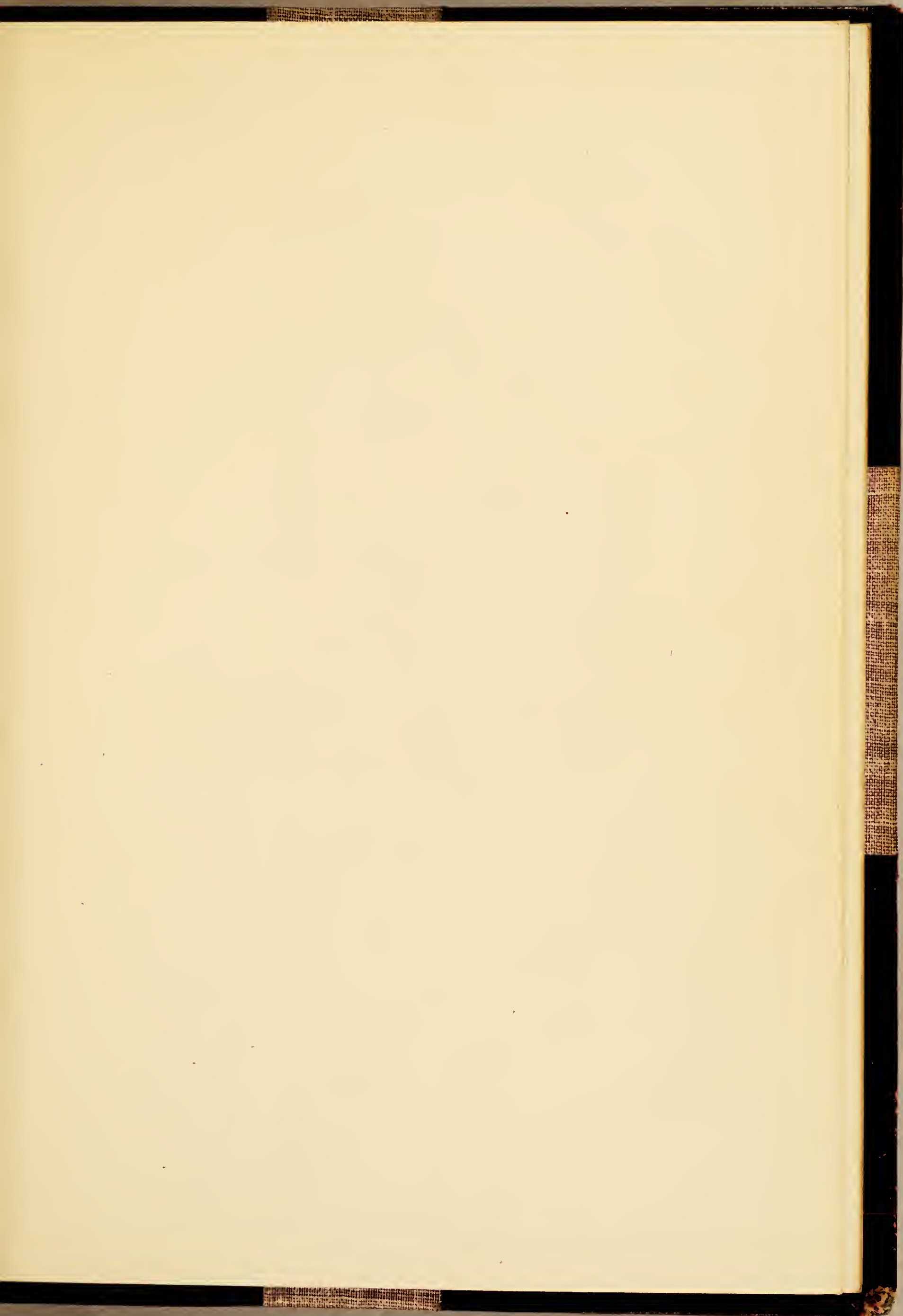
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V			W		
V Arguy	150	50	39	0	39
Valentia	29	20	39	41	1
Varcano	107	50	39	0	57
Varon	83	30	70	30	30
Vaygats an Iland	81	30	69	21	70
Venice	41	40	45	51	26
Verdiso	59	50	45	0	30
Verdun	32	10	49	20	11
Verma Reg.	133	0	21	30	92
Varona	40	40	45	50	1
Viana	17	30	42	0	17
Viatca	87	50	59	30	15
Vich	81	40	53	50	52
Vienna	45	30	48	30	16
Villac	48	0	46	50	41
Villa longa	28	20	7	40	41
Ville condc	17	30	41	30	29
Villna	54	30	55	0	41
Virginia	302	10	36	0	29
Vissigrod	61	30	51	30	41
Bona vista	4	30	15	30	0
Buena vista	308	40	40	11	29
Buena vista	177	30	13	30	35
Vkill	53	10	57	0	29
Vlm	37	50	48	50	0
Volga a riuer	75	40	58	0	50
Vpfalia	42	50	60	0	29
Vreamca	23	50	46	0	0
Vrgis a riuer	85	50	53	20	50
Vfting	79	30	61	30	50
Vftusna	67	0	59	20	50
Vtuall	42	40	62	50	50
			X		
			X Aiel	85	30
			Xandu	108	40
			Xancs	311	30
			Xaques	282	0
			Xara	130	0
				15	41
				55	41
				11	1
				20	29
				17	1



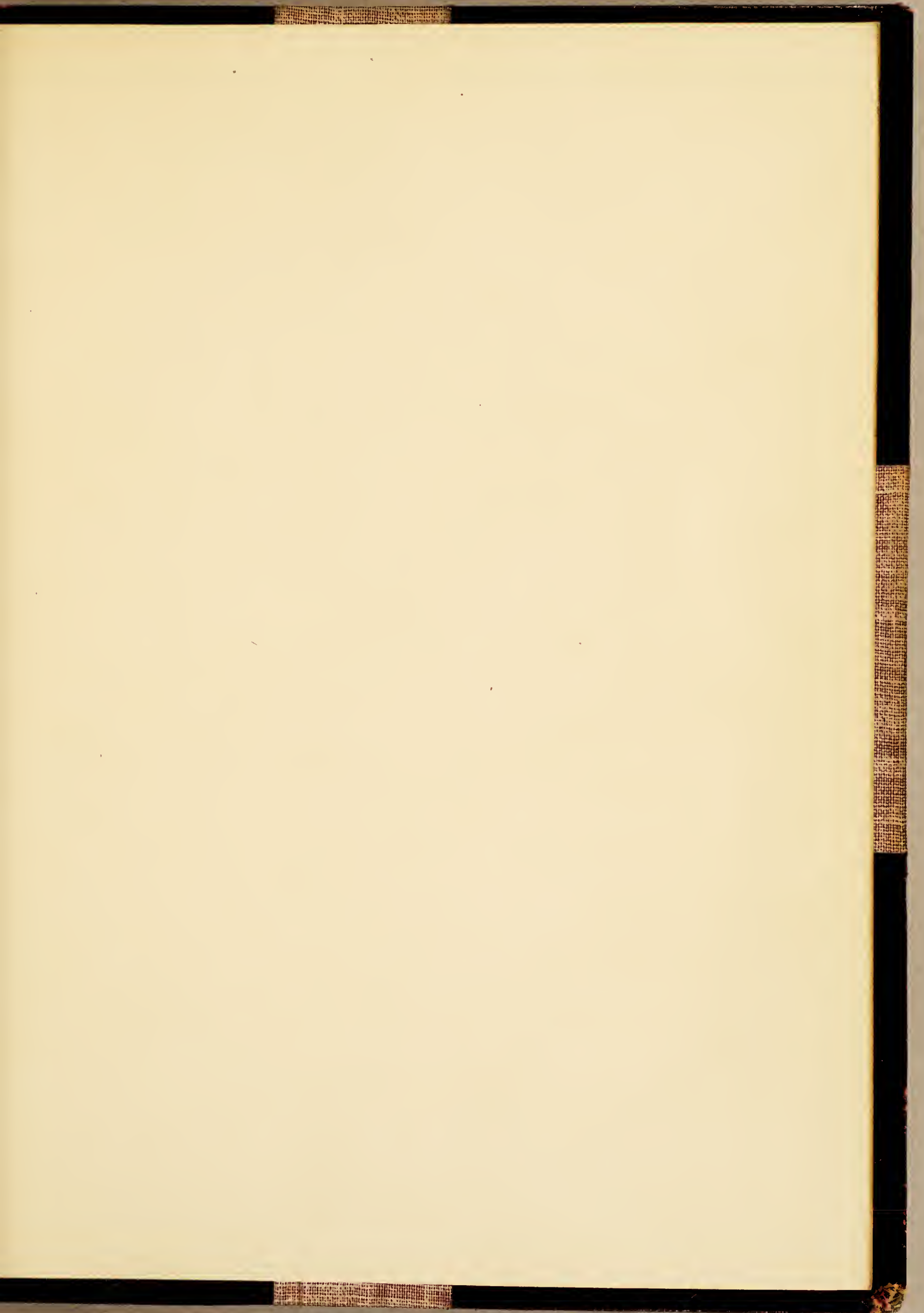


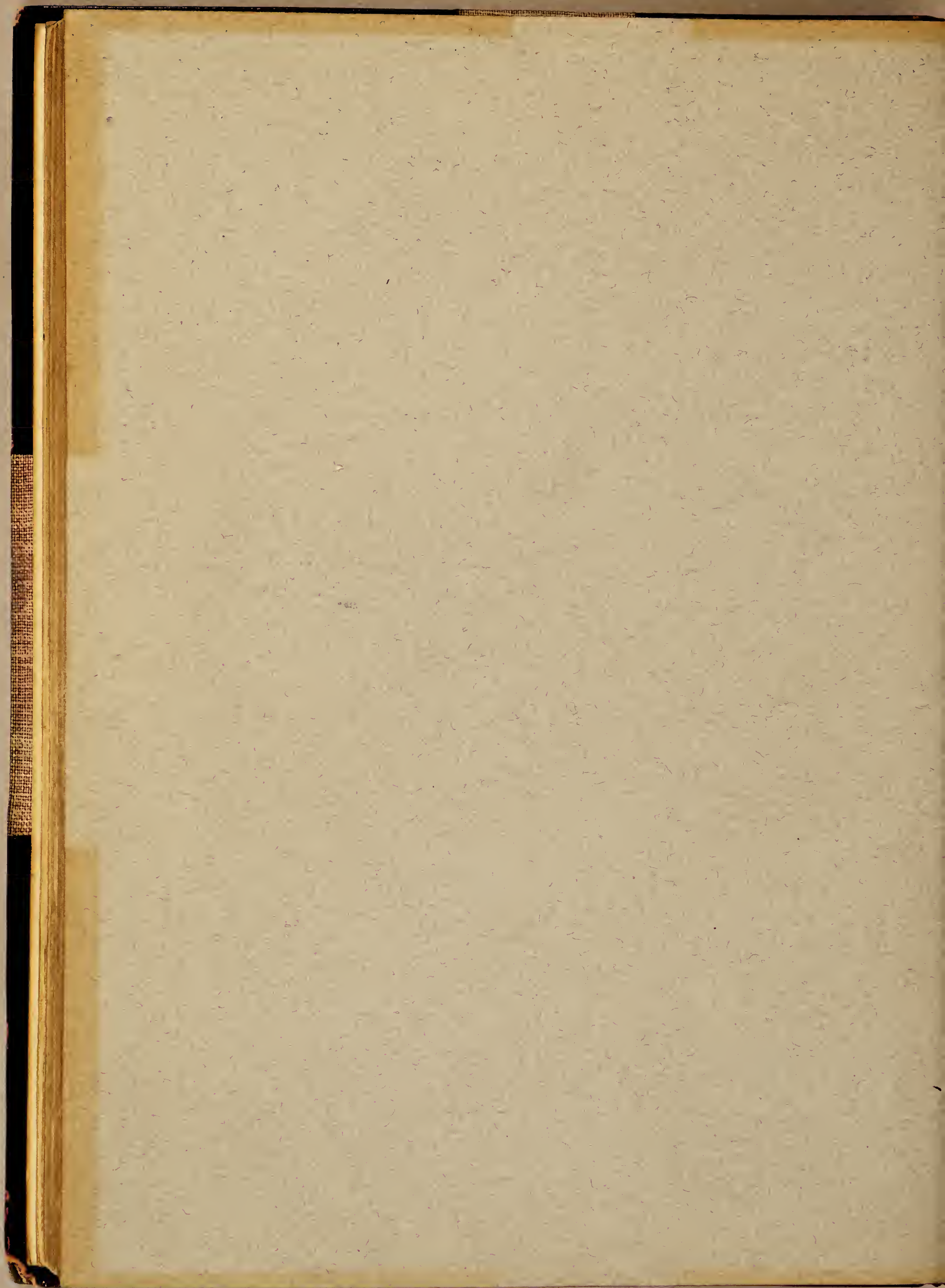












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