Remarks upon the solar and the lunar years, the cycle of 19 years, commonly called the golden number, the epact, and a method of finding the time of Easter, as it is now observed in most parts of Europe / Being part of a letter from the Right Honourable George Earl of Macclesfield to Martin Folkes, President of the Royal Society, and by him communicated to the same, May 10 1750.

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REMARKS

UPON

THE SOLAR AND THE LUNAR YEARS,

The Cycle of 19 Years, commonly called

THE GOLDEN NUMBER,

THE EPACT,

And a Method of finding the Time of *Easter*, as it is now observed in most Parts of *Europe*.

Being Part of a LETTER from

The Right Honourable

GEORGE EARL OF MACCLESFIELD

to

Martin Folkes Esq; *President* of the *Royal Society*,

and by him communicated to the same, *May* 10. 1750.

LONDON:

Printed for CHARLES DAVIS, Printer to the *Royal Society*.

M.DCC.LI.

REMARKS

UPON

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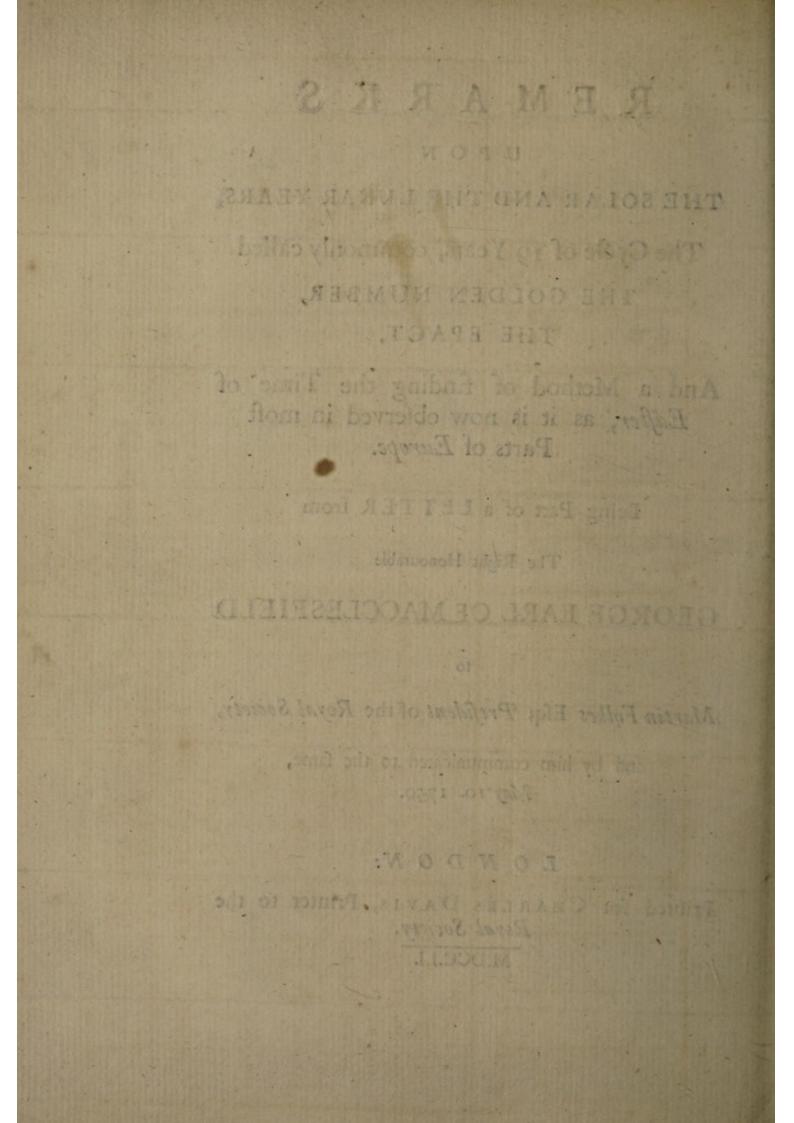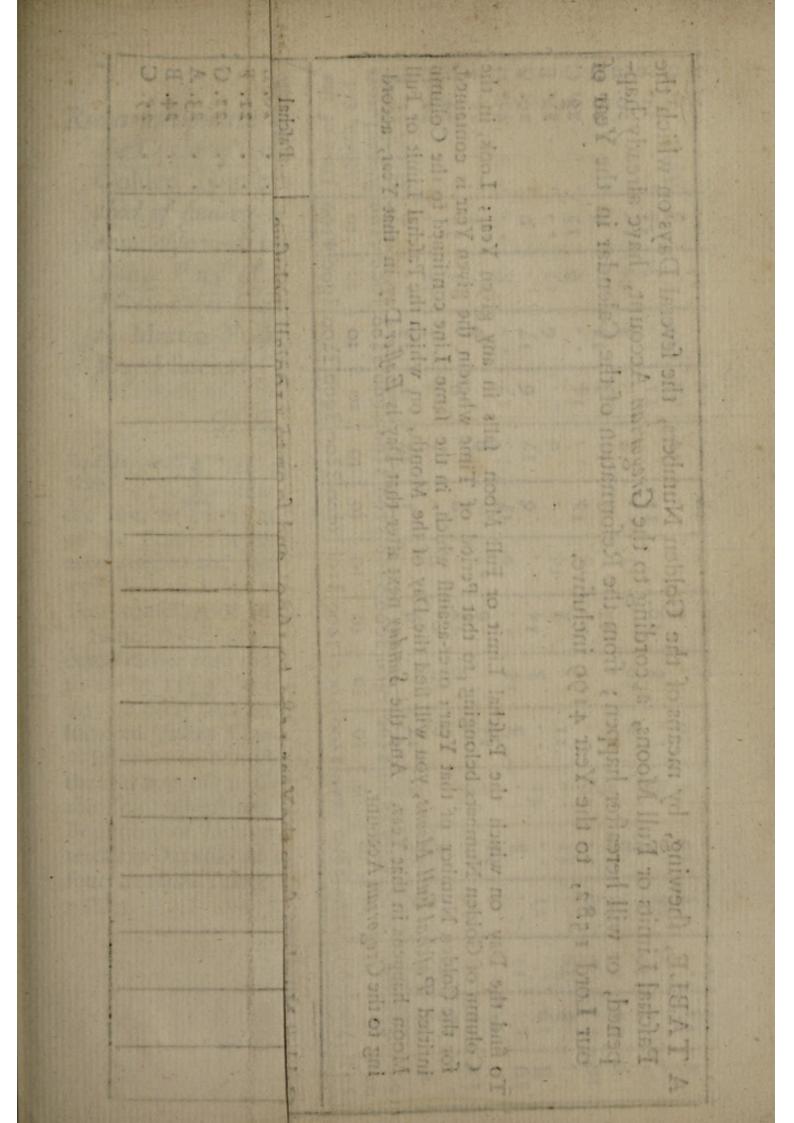The Right Honourable

GEORGE EARL OF MACCLESFIELD

to

Martin Folkes Esq; President of the Royal Society,

and by him communicated to the Same, May 10, 1750.

A TABLE, shewing, by means of the Golden Numbers, the several Days on which the Paschal Limits or Full Moons, according to the *Gregorian* Account, have already happened, or will hereafter happen; from the Reformation of the Calendar in the Year of our Lord 1582, to the Year 4199 inclusive.

To find the Day on which the Paschal Limit or Full Moon falls in any given Year; Look, in the Column of Golden Numbers belonging to that Period of Time wherein the given Year is contained, for the Golden Number of that Year; over-against which, in the same Line continued to the Column intitled *Paschal Full Moons*, you will find the Day of the Month, on which the Paschal Limit or Full Moon happens in that Year. And the *Sunday* next after that Day is *Easter* Day in that Year, according to the *Gregorian* Account.

| Golden Numbers from the Year 1583 to 1699, and so on to 4199, all inclusive. | | | | | | | | | | | | | | | | Paschal Full Moons. |
1583 to 1699	1700 to 1899	1900 to 2199	2200 to 2299	2300 to 2399	2400 to 2499	2500 to 2599	2600 to 2899	2900 to 3099	3100 to 3399	3400 to 3499	3500 to 3599	3600 to 3699	3700 to 3799	3800 to 4099	4100 to 4199	Days of the Month, and Sunday Letters
3	14		6	17	6	17		9		1	12	1	12		4	March 21. C
	3	14		6		6	17		9		1		1	12		22. D
11		3	14		14		6	17		9		9		1	12	23. E
	11		3	14	3	14		6	17		9		9		1	24. F
19		11		3		3	14		6	17		17		9		25. G
8	19		11		11		3	14		6	17	6	17		9	26. A
	8	19		11		11		3	14		6		6	17		27. B
16		8	19		19		11		3	14		14		6	17	28. C
5	16		8	19	8	19		11		3	14	3	14		6	29. D
	5	16		8		8	19		11		3		3	14		30. E
13		5	16		16		8	19		11		11		3	14	31. F
2	13		5	16	5	16		8	19		11		11		3	April 1. G
	2	13		5		5	16		8	19		19		11		2. A
10		2	13		13		5	16		8	19	8	19		11	3. B
	10		2	13	2	13		5	16		8		8	19		4. C
18		10		2		2	13		5	16		16		8	19	5. D
7	18		10		10		2	13		5	16	5	16		8	6. E
	7	18		10		10		2	13		5		5	16		7. F
15		7	18		18		10		2	13		13		5	16	8. G
4	15		7	18	7	18		10		2	13	2	13		5	9. A
	4	15		7		7	18		10		2		2	13		10. B
12		4	15		15		7	18		10		10		2	13	11. C
1	12		4	15	4	15		7	18		10		10		2	12. D
	1	12		4		4	15		7	18		18		10		13. E
9		1	12		12		4	15		7	18	7	18		10	14. F
	9		1	12	1	12		4	15		7		7	18		15. G
17		9		1		1	12		4	15		15		7	18	16. A
6	17	17	9		9		1	12	12	4	15	4	15	15	7	17. B
14	6	6	17	9	17	9	9	1	1	12	4	12	4	4	15	18. C
																19. D
																20. E
																21. F
																22. G
																23. A
																24. B
																25. C

Remarks upon the Solar *and the* Lunar *Years, the* Cycle *of* 19 *Years, commonly called the* Golden Number, *the* Epact, *and a Method of finding the Time of* Easter, *as it is now obferved in moft Parts of* Europe. *Being Part of a Letter from the Right Honourable* George Earl *of* Macclesfield *to* Martin Folkes *Efq*; *Prefident of the* Royal Society.

Of the Solar Year.

THE mean *Tropical Solar Year,* or that mean Space of Time wherein the Sun, or Earth, after departing from any Point of the Ecliptic returns to the fame again, confifts, according to Dr. *Halley*'s Tables, of 365ᵈ, 5ʰ, 48′, 55″: Which is lefs by 11′, 5″, than the mean *Julian* Year, confifting of 365ᵈ, 6ʰ, 0′, 0″.

Hence the Equinoxes and Solftices anticipate, or come earlier than the *Julian* Account fuppofes them to do by 11′, 5″, in each mean *Julian* Year; or 44′, 20″ in every four; or 3ᵈ, 1ʰ, 53′, 20″, in every four hundred *Julian* Years.

In order to correct this Error in the *Julian* Year, the Authors of the *Gregorian* Method of regulating the Year, when they reformed the Calendar in the Beginning of *October* 1582, directed that three intercalary Days fhould be omitted or dropped in every four hundred Years; by reckoning all thofe Years,

* whofe

whose Date consists of a Number of entire Hundreds not divisible by 4, such as 1700, 1800, 1900, 2100, &c. to be only Common, and not Bissextile or Leap Years, as they would otherwise have been; and consequently omitting the intercalary Days, which, according to the *Julian* Account, should have been inserted in the Month of *February* in those Years. But at the same time they order'd that every fourth hundredth Year, consisting of a Number of entire Hundreds, divisible by 4, such as 1600, 2000, 2400, 2800, &c. should still be consider'd as Bissextile or Leap Years, and, of consequence, that one Day should be intercalated as usual in those Years.

This Correction, however, did not entirely remove the Error: For the Equinoxes and Solstices still anticipate 1^h, $53'$, $20''$ in every four hundred *Gregorian* Years.

But that Difference is so inconsiderable as not to amount to twenty-four Hours, or to one whole Day, in less than 5082 *Gregorian* Years.

Of the Lunar Year, Cycle of 19 Years, *and* the Epact.

The Space of Time betwixt one mean Conjunction of the Moon with the Sun and the next following, or a mean *Synodical Month*, is equal to 29^d, 12^h, $44'$, $3''$, $2'''$, 56^{iv}, according to Mr. *Pound's* Tables of mean Conjunctions.

The Common Lunar Year consists of 12 such Months.

The

The Intercalary or *Embolimæan* Year confifts of 13 fuch Months.

In each Cycle of 19 Lunar Years, there are 12 Common, and 7 Intercalary or *Embolimæan* Years, making together 235 Synodical Months.

It was thought, at the time of the General Council of *Nice*, which was holden in the Year of our Lord 325, that 19 *Julian* Solar Years were exactly equal to fuch a Cycle of 19 Lunar Years, or to 235 Synodical Months; and therefore, that, at the End of 19 Years, the New Moons or Conjunctions would happen exactly at the fame Times, as they did 19 Years before: And upon this Suppofition it was, that, fome time afterwards, the feveral Numbers of that Cycle, commonly called the Golden Numbers, were prefixed to all thofe Days in the Calendar, on which the New Moons then happened in the refpective Years correfponding to thofe Numbers; it being imagined, that whenfoever any of thofe Numbers fhould for the future be the Golden Number of the Year, the New Moons would invariably happen on thofe Days in the feveral Months, to which that Number was prefixed.

But this was a Miftake:

	d	h	′	″	‴
For 19 *Julian* Solar Years contain	6939,	18,	0,	0,	0
Whereas 235 Synodical Months contain only . . .	6939,	16,	31,	56,	30
And are therefore lefs than 19 *Julian* Solar Years by . .		0,	1,	28,	3,	30.

This Difference amounts to a whole Day very nearly in 310.7 Years, the New Moons anticipating,

or falling earlier, by 24 Hours in that Space of Time, than they did before : And therefore now in the Year 1750, the New Moons happen above four Days and a half fooner, than the Times pointed out by the Golden Numbers in the Calendar.

In order therefore to preferve a fort of regular Correfpondence betwixt the Solar and the Lunar Years, and to make the Golden Numbers, prefixed to the Days of the Month, ufeful for determining the Times of the New Moons, it would be neceffary, when once thofe Golden Numbers fhould have been prefixed to the proper Days, to make them anticipate a Day at the End of every 310.7 Years, as the Moons will actually have done; that is to fet them back one Day, by prefixing each of them to the Day preceding that, againft which they before ftood.

But as fuch a Rule would neither be fo eafily comprehended or retained in Memory, as if the Alteration was to be made at the End or at the Beginning of complete Centuries of Years; the Rule would be much more fit for Practice, and keep fufficiently near to the Truth, if thofe Numbers fhould be fet back nine Days in the Space of 2800 Years; by fetting them back one Day, firft at the End of 400 Years, and then at the End of every 300 Years for eight times fucceffively: whereby they would be fet back, in the whole, nine Days in 2800 Years. After which they muft again be fet one Day back at the End of 400 Years, and fo on, as in the preceding 2800 Years. By which means the Golden Numbers would always point out the mean Times of the New Moons, within a Day of the Truth.

It

It is plain however that the Lunar Year will have
loft one Day more than ordinary, with refpect to
the Solar Year, whenever the New Moons fhall have
anticipated a whole Day; as they will have done at
thofe times, when it is neceffary that the Golden
Numbers fhould, by the Rule juft now given, be fet
back one Day : and confequently the Epact, for that
and the fucceeding Years, muft exceed by an Unit
the feveral correfponding Epacts of the preceding 19
Years.

For the Epact is the Difference, in whole Days, be-
twixt the common *Julian* Solar and the Lunar Year;
the former being reckoned to confift of 365, and the
latter of only 354 Days. If therefore the Solar and the
Lunar Year at any time fhould commence on the fame
Day, the Solar would, at the End of the Year, have ex-
ceeded the Lunar by 11 Days; which Number 11 would
be the Epact of the next Year : 22 would be the Epact
of the Year following, and 33 the Epact of the Year
after that, the Epacts increafing yearly by 11. But as
often as this yearly Addition makes the Epact exceed
30, thofe 30 are rejected as making an intercalary
Month, and only the Excefs of the Epact above 30 is ac-
counted the true Epact for that Year. Thus when the
Epact would amount to 31, 32, 33, 34, &c. the 30
is rejected, and the Epact becomes 1, 2, 3, 4, &c.

Since therefore the Lunar Year will have loft a Day
more than ordinary, in refpect of the Solar Year,
whenever it is neceffary to fet the Golden Numbers
one Day back, as was before obferved; it follows,
that the Epact muft at the fame time be increafed
by an Unit more than ufual : the Difference betwixt
the Solar and the Lunar Year having been juft fo
much

much greater than ufual. That is, 12 muft be added, inftead of 11, to the Epact of the preceding, in order to form what will be the Epact of the then prefent Year. Which Addition of an Unit extraordinary to one Epact will occafion all the fubfequent Epacts (which will follow each other in the ufual manner, each exceeding the foregoing by 11) to be greater by an Unit than their refpectively correfponding Epacts of the preceding 19 Years.

If therefore, inftead of the Golden Numbers, the Epacts of the feveral Years were prefixed, in the manner the *Gregorians* have done, to the Days of the Calendar, in order to denote the Days on which the New Moons fall in thofe Years whereof thofe Numbers are the Epacts; there would never be Occafion to fhift the Places of thofe Epacts in the Calendar; fince the Augmentation by an Unit extraordinary of the Epacts themfelves would anfwer the Purpofe, and keep all tolerably right.

Thus in a very eafy Method may the Courfe of the New Moons be pointed out, either by the Golden Numbers, or by the Epacts, according to the *Julian* Account or Manner of adjufting the Year, which goes on regular and uniform without any Variation.

But the regulating thefe things for thofe who ufe the *Gregorian* Account, is an Affair of more Intricacy; and for them it will require more Confideration to determine, when the Epacts are to be more than ordinarily augmented, and at what Times they are to continue in their ufual Courfe; nay, to know when they are not only not to be extraordinarily augmented, but alfo when they are to be diminifhed by an Unit, by increafing one of them by 10 only inftead of 11 as ufual: and this happens much oftener with the

Gregorians,

Gregorians, than the increafing one of them by 12 inftead of 11. For, in every *Gregorian* Solar Year, whofe Date confifts of any Number of entire Hundreds not divifible by 4, it is fuppofed that the Equinox has anticipated one whole Day; and therefore one Day, that which ought to be the intercalary one, is omitted; and confequently the preceding Solar Year, where one Day was loft, exceeded the Lunar Year by 10 Days only inftead of 11.

In order therefore to adapt the before-mention'd Rule to the *Gregorian* Account, and to know in what Years the Epacts fhould either be extraordinariy augmented or diminifhed, and the Golden Numbers fhould either be fet backwards or forwards in the Calendar; the following Rules and Directions muft be obferved.

First. That in the Years 1800, 2100, 2700, 3000, *&c.* where the Number of entire Hundreds is divifible by 3, but not by 4, the *Gregorian* Solar, as well as the Lunar Year, will have loft a Day; and confequently the Difference betwixt them will be the fame as ufual: Therefore in thofe Years there muft be no Alteration, either in the Epacts or the Golden Numbers; but the former muft go on in the fame manner, and the latter ftand prefixed to the fame Days in the Calendar, for another, as they did for the laft hundred Years.

2dly. The like will happen in the Years 2000, 2800, 3200, *&c.* where the Number of entire Hundreds is divifible by 4, but not by 3: For neither the *Gregorian* Solar nor the Lunar Year is to be altered; and therefore the Epacts muft go on, and the Golden Numbers ftand, as they did before.

But,

But, 3dly, In the Years 2400, and 3600, whofe Number of entire Hundreds is divifible both by 3 and 4, the *Gregorian* Solar Year goes on as ufual, and the Lunar Year has loft a Day. The Difference therefore betwixt them being 12, the Epact of the preceding Year muft be augmented by that Number inftead of 11, in order to form the Epact of the then prefent Year; whereby a new Set of Epacts will be introduced, exceeding their precedent correfponding Epacts by an Unit: And the Golden Numbers muft be fet one Day back in the Calendar.

4thly and laftly, In the Years 1900, 2200, 2300, 2500, &c. where the Number of Hundreds is divifible neither by 3 nor 4; the *Gregorian* Solar Year having loft one Day, and the Lunar none, the Difference betwixt them being only 10; that Number only, and not 11, is to be added to the Epact of the preceding, in order to form the Epact of that, the then prefent Year; whereby a new Set of Epacts will be introduced, all of them lefs by an Unit than their precedent correfponding Epacts: And the Golden Numbers muft be fet a Day forwarder in the Calendar; that is, be prefixed to the Day following that, againft which they ftood in the precedent hundred Years.

This Method would preferve a fort of Regularity betwixt the Solar and the Lunar Years; and, by means of the Rules and Directions before-mentioned, the Days of the New Moons might be pointed out, either by the Golden Numbers or by the Epacts, placed in the Calendar for that Purpofe; according to the *Julian* Account for ever, and according to the *Gregorian* Account till the Year 4199 inclufive, after which

which there muſt be ſome little Variation made in the four laſt Precepts or Rules; but it would be to little Purpoſe now, to attempt the framing of a new Set of Rules for ſo diſtant a Time.

The *Gregorians* have choſen to make uſe of the Epacts to determine the Days of the New Moons; and follow pretty nearly the Rules preſcribed above; except that they order the Epacts to have an additional Augmentation of an Unit eight times in 2500 Years, beginning with the Year 1800, as at the End of 400 Years; to which 400 Years if there be added three times ſeven hundred, or 2100 Years, the Period of 2500 Years will be completed in the Year 3900. After which they do not make their extraordinary Augmentation of an Unit in the Epacts, till at the End of another Term of 400 Years; which defers that Augmentation from the Year 4200 to the Year 4300. And this is the Reaſon that the Rules above delivered will require a Variation in the Year 4200; whereas it is directed in this Paper that the Epacts ſhould be augmented, or (which is the ſame thing) the Golden Numbers be ſet back in the Calendar nine times in 2800 Years. This ariſes from the *Gregorians* ſuppoſing, that the Difference betwixt 19 Solar and as many Lunar Years would not amount to a whole Day in leſs than 312 Years and a half; whereas it has appeared above, that it would amount to a whole Day in 310.7 Years. But although the Rule preſcribed in this Paper comes much nearer to the Truth, yet the Error in either Caſe is very inconſiderable, being ſo ſmall as not to amount to a whole Day in many thouſand Years; and therefore is not worth regarding.

*

A

A Method of finding the Time of Easter, *as it is observed in most Parts of* Europe.

From what has been already said, a Method may be obtained, for fixing, with sufficient Exactness, the Time of the Celebration of the Feast of *Easter*, which is governed by the *Vernal Equinox*, and by the Age of the Moon nearest to it. The former whereof, when once rightly adjusted, may (by the Corrections mentioned in that Part of this Paper which relates to the Solar Year) be made to continue to fall at very near the same time with, or at most not to differ a whole Day from the true *Equinox*: and the same Rules and Directions, which, as was before shewn, would, without any great Error, point out the Times of the first Day of the Moon, would with equal Certainty point out the fourteenth, fifteenth, or any other: And thus the Times of the Oppositions or the Full Moons might be as well marked out thereby, as those of the Conjunctions or the New Moons.

I shall not at present take notice of the Canon of the Council of *Nice*, in the Year of our Lord 325, which directs the Time of celebrating the Feast of *Easter*, or of the Reasons upon which that Canon was founded. Nor shall I endeavour to explain the Rule now in Use in the Church of *England* for finding *Easter*: For, besides that such an Explanation would extend this Paper to an improper Length, those Points have already been treated of by several much abler Hands, and particularly by our Countryman the learned Dr. *Prideaux*. Nor is it my Intention to enter far into

the

the Methods ufed by the *Gregorians*, or thofe of the
Church of *Rome*, or by any other Nations or Coun-
tries, for finding the Time of that Feaft. As to our
own, I fhall only obferve, that the Method now ufed
in *England*, for finding the fourteenth Day of the
Moon, or the Ecclefiaftical Full Moon, on which
Eafter dependeth, is, by Procefs of Time, become
confiderably erroneous: as the Golden Numbers,
which were placed in the Calendar, to point out the
Days on which the New Moons fall in thofe Years
of which they are refpectively the Golden Numbers,
do now ftand feveral Days later in the fame than thofe
New Moons do really happen. Which Error, as was
before obferved, arifes from the Anticipation of the
Moons fince the Time of the Council of *Nice*: And as
the *Vernal Equinox* has alfo anticipated eleven Days
fince that time; neither that Equinox, nor the New
Moons, do now happen on thofe Days upon which
the Church of *England* fuppofes them fo to happen.

When Pope *Gregory* XIII. reformed the *Julian*
Solar Year, he likewife made a Correction as to the
Time of celebrating the Feaft of *Eafter*, by placing
the Epacts (which he directed to be made ufe of
for the future inftead of the Golden Numbers) much
nearer to the true Times of the New Moons than
the Golden Numbers then ftood in the old Calendar:
I fay, *much nearer to the true Times*; becaufe in
fact the Epacts, as placed by him, were not prefixed
to the exact Days upon which the New Moons then
truly fell. And this was done with Defign, and for a
Reafon which it is not material to the Purpofe of
this Paper to mention.

But

But the Church of *England*, and that of *Rome* or the *Gregorians*, do ftill agree in this; that both of them mark (the former by the Golden Numbers, and the latter by the Epacts correfponding to them) the Days on which their Ecclefiaftical New Moons are fuppofed to happen: And that fourteenth Day of the Moon inclufive, or that Full Moon, which falls npon, or next after, the 21ft Day of *March*, is the Pafchal Limit or Full Moon to both: And the *Sunday* next following that Limit or Full Moon, is by both Churches celebrated as *Eafter* Day. But the 21ft of *March* being reckoned, according to the *Gregorian* Account or the New Style, eleven Days fooner than by the *Julian* Account or the Old Style, which is ftill in Ufe amongft us; and their Ecclefiaftical New Moons being three Days earlier than thofe of the Church of *England*; it happens that although the Church of *England* and that of *Rome* often do, yet more frequently they do not, celebrate the Feaft of *Eafter* upon the fame natural Day.

It might however be eafier for both, and could occafion no Inconvenience, now that Almanacks, which tell the exact Times of the New Moons, are in moft Peoples Hands; if all the Golden Numbers and Epacts now prefixed to thofe Days of the Calendar, in our Book of Common Prayer, and in the *Roman Breviary*, on which the refpective Ecclefiaftical New Moons happen, were omitted in the Places where they now ftand; and were fet only againft thofe four-teenth Days of the Moon, or thofe Full Moons, which happen betwixt the 21ft Day of *March* and the 18th of *April*, both inclufive. Since no fourteenth Day or Full Moon, which happens before the 21ft

of

of *March*, or after the 18th Day of *April*, can have any Share in fixing the Time of *Easter*. By which means the Trouble of counting to the fourteenth Day, and the Miſtakes which ſometimes ariſe therefrom, would be avoided.

We do as yet in *England* follow the *Julian* Account or the Old Style in the Civil Year; as alſo the Old Method of finding thoſe Moons upon which *Easter* depends: Both of which have been ſhewn to be very erroneous.

If therefore this Nation ſhould ever judge it proper to correct the Civil Year, and to make it conformable to that of the *Gregorians*, it would ſurely be adviſeable to correct the Time of the Celebration of the Feaſt of *Easter* likewiſe, and to bring it to the ſame Day upon which it is kept and ſolemnized by the Inhabitants of the greateſt Part of *Europe*, that is, by thoſe who follow the *Gregorian* Account. For tho' I am aware, that their Method of finding the Time of *Easter* is not quite exact, but is liable to ſome Errors; yet I apprehend, that all other practicable Methods of doing it would be ſo too: And if they were more free from Error, they would probably be more intricate, and harder to be underſtood by Numbers of People, than the Method of determining that Feaſt either by a Cycle of Epacts, as is practiced by the *Gregorians*, or by that of 19 Years or the Golden Numbers, in the manner propoſed in the following Part of this Paper: And it is of no ſmall Importance, that a Matter of ſo general a Concern, as the Method of finding *Easter* is, ſhould be within the Reach of the Generality of Mankind, at leaſt as far as the Nature of the thing will admit.

For

For which Reason, in cafe the Legiflature of this Country fhould before the Year 1900, think fit to make our Civil Year correfpond with that of the *Gregorians*, and alfo to celebrate all the future Feafts of *Eafter* upon the fame Days upon which they celebrate them; this laft Particular might be eafily effected, without altering the Rule of the Church of *England* for the finding of that Feaft: And this only by advancing the Golden Numbers, prefixed to certain Days in the Calendar, 8 Days forwarder for the New Moons, or 21 Days forwarder for the fourteenth Days or Full Moons, than they now ftand in our Calendar.

In order to explain this, it muft be obferved, that the *Gregorian* Account or the New Style is eleven Days forwarder than the *Julian* Account or the Old Style, which we ftill make ufe of; that is, the laft Day of any of our Months is the eleventh Day of their next fucceeding Month. If therefore their Ecclefiaftical New Moons fell on the fame Days with thofe of the Church of *England*, the Golden Number 14, which now ftands againft the laft Day of *February* in our that is the *Julian* Calendar, fhould, when we fhould have adopted the *Gregorian* Calendar, be prefixed to the 11th Day of *March*. But fince their Ecclefiaftical New Moons happen 3 Days earlier than our Ecclefiaftical New Moons at prefent do; fo much fhould be deducted from thofe 11 Days, by which the Golden Numbers ought otherwife to be advanced; and the Golden Number 14 fhould not be placed againft the 11th, but the 8th Day of *March:* Which being reckoned the firft Day of the Moon, if we count on to the fourteenth Day of the fame inclufive, that would be found to fall on the 21ft Day of *March;* on which

Day

Day the *Gregorian* Paschal Limit or Full Moon will happen when the Golden Number is 14. And the like Course should be taken with the rest of the 19 Golden Numbers; which ought to be placed 8 Days forwarder than they now stand, if they are to point out the New Moon; or 21 Days forwarder than they are at present, if they are to mark the fourteenth Day of the Moon or the Full Moon: The latter of which, as has been shewn, would be more eligible, than to prefix those Numbers to the Days on which the New Moons happen.

Thus may the Rule and Method now used in the Church of *England*, be most easily adapted to shew the Time of *Easter*, as it is observed by the *Gregorians*, till the Year 1900; at which Time, and at the other proper succeeding Times, if the Golden Numbers in the Calendar shall either be advanced or set backward a Day, according the foregoing Rules and Directions for that Purpose, they will continue to shew us the New or the Full Moons, of the Church of *Rome* or the *Gregorian* Calendar with great Exactness, till the Year 4199: when, as has been already mentioned, there must be a little Variation made in those Rules and Directions.

There is however one Exception to those General Rules and Directions, which will be taken notice of in the next Paragraph.

Upon these Principles I framed the Table accompanying this Paper, and shewing, by means of the Golden Numbers, all the *Gregorian* Paschal Limits or Full Moons, from the Reformation of the Calendar, &c. by Pope *Gregory* to the Year 4199 inclusive. Which Space of Time is therein divided into sixteen unequal Portions or Periods; at the Beginning of

each

each of which, all the Golden Numbers, when once they shall have been properly placed in the Calendar, must either be advanced or set back one Day, with respect to the Place where they stood in the preceding Period, agreeably to the foregoing Rules: Except those Numbers which shall happen to stand against the 4th and 5th of *April* to shew the Paschal New Moons, or against the 17th and 18th of the same Month to mark out the Paschal Full Moons; both which Numbers at some Times, and only one of them at others, must keep the same Place for that, which was allotted to them in the immediately preceding Period.

In order to determine at what Times, and on what Occasions, this Exception is to take Place; let it be observed, that, in the Months of *January, March, May*, and some others in our present Calendar, as well as in the Table above mentioned, some of the Golden Numbers stand double or in Pairs, and follow one the other immediately; whilst others, on the contrary, generally stand single and by themselves.

Now, when any of those Pairs, or two Numbers which usually accompany each other, happen, in pursuance of the foregoing Rules, to be prefixed the one to the 4th and the other to the 5th of *April* for the New Moons, or the one to the 17th and the other to the 18th of *April* for the Paschal Limits or Full Moons: And when any of those Numbers, which generally stand single, are prefixed, according to the said Rules, to the 5th of *April* for the New Moons, or to the 18th for the Full Moons: In these Cases those Pairs or single Numbers that are so situated, must not be set forward or advanced at the Begin-
ning

ning of the next Period, but muſt keep their Places
during another Period, if the foregoing Rules di-
rect all the Golden Numbers to be advanced a Day;
which muſt be complied with in reſpect to all the
other Golden Numbers, except thoſe ſo ſituated as
above. Inſtances whereof may be ſeen in the Table,
under the reſpective Periods beginning with the Years
1900, 2600, 3100, and 3800.

But if, in Conformity to the foregoing Rules, all
the Golden Numbers are to be ſet one Day back-
ward; thoſe Pairs or ſingle Numbers, tho' ſituated
as is above-mentioned, muſt not keep their Places,
but muſt move one Day backward like all the other
Golden Numbers; as they may be ſeen to do in the
Periods beginning with the Years 2400 and 3600.

To give a plain and intelligible Account of the
Reaſon, on which the Directions now given with
reſpect to this Exception are founded, would extend
this Paper, already too long, far beyond its due and
proper Bounds. I ſhall therefore content myſelf with
obſerving, that it depends chiefly upon the Nature
of the *Menſes Pleni* and *Menſes Cavi*, into which
the Lunar Year is uſually divided: and that, in order
to make uſe of the Golden Numbers for finding the
Time of the *Gregorian Eaſter*, it will be neceſſary
not only to conform to the general Rules laid
down in the former Part of this Paper; but alſo to
follow the Directions juſt now given, with reſpect to
the above-mentioned Exception to thoſe general
Rules.

But I ſhould not do Juſtice to *Peter Davall*, of
the *Middle Temple*, Eſq; Secretary of the *Royal*
<div align="center">C</div> *Society,*

Society, did I not here acknowledge, that, before I had fo fully confidered thefe Matters as I have fince done, I had the firft Hint of applying the Golden Numbers to find the *Gregorian* Pafchal Limit or full Moon, from him; who has fince that time compofed and drawn up Tables, *&c.* which may poffibly be of confiderable and general Ufe in this Nation hereafter.

F I N I S