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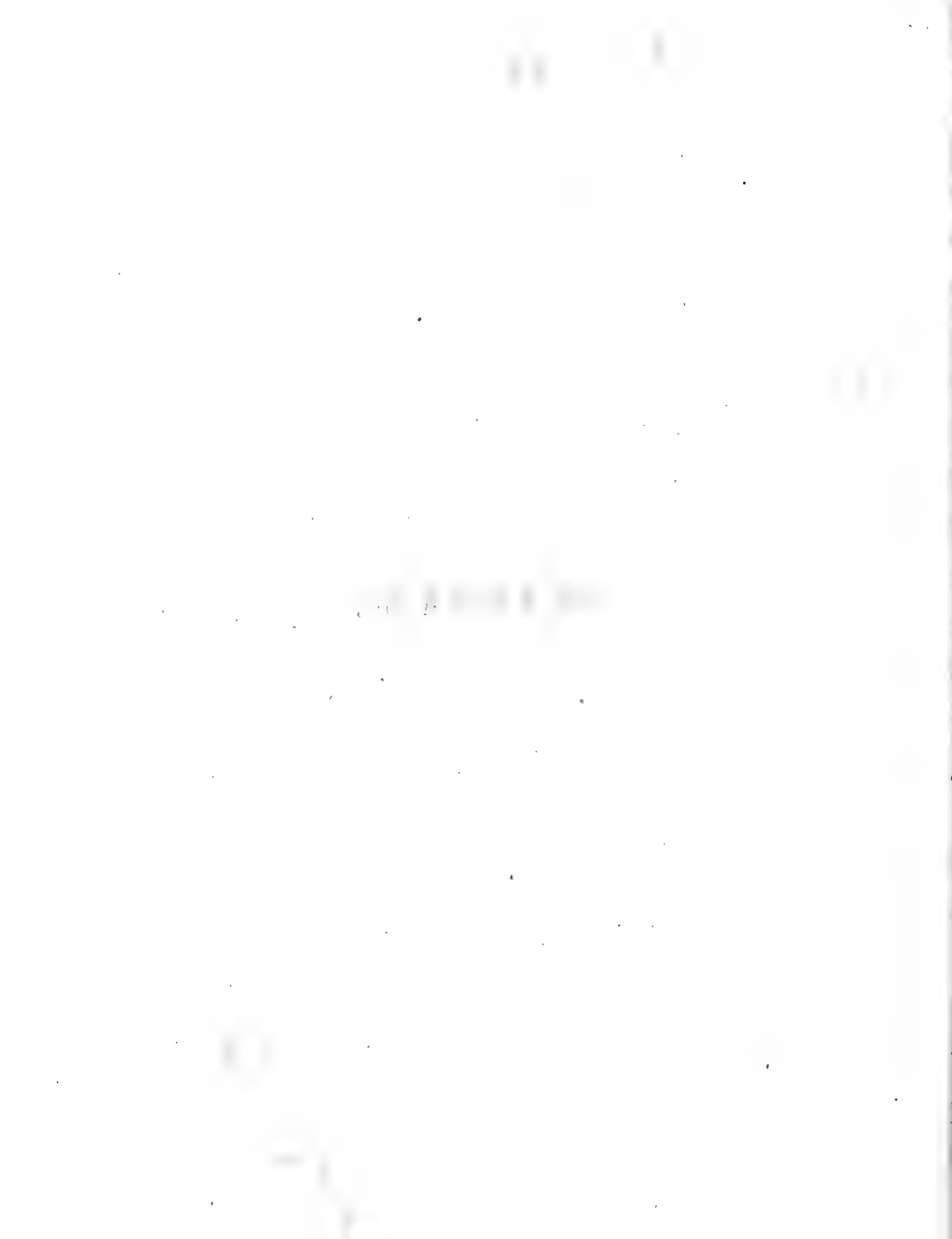
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SCIENCE.

VOL. XIV.



The Quantity of Solar Nutation as affecting the North Polar Distances of the fixed Stars deduced from Observation, and the Application of this Determination to confirm the Conclusions relative to the Parallaxes of certain fixed Stars. By the Rev. John Brinkley, D. D. F. R. S. President of the R. I. A. and Andrews' Professor of Astronomy in the University of Dublin.

Read April 1, 1822.

IN the Twelfth Volume of the Transactions of the Royal Irish Academy, an account was given of observations made at the Observatory of the College, by which the annual parallaxes of certain fixed stars appeared to be determined.

Mr. Pond immediately referred to the observations made at the Royal Observatory, Greenwich, with the new mural circle; and, although some small changes of place appeared to have been exhibited by the observations made with that instrument, he was of opinion, that those changes did not arise from parallax.

To ascertain this point with greater certainty, he procured fixed telescopes of considerable length to be erected at Greenwich, and furnished with micrometers; by which stars nearly opposite in right ascension, and having nearly the same zenith distance, could be examined.

The result of his observations appeared entirely adverse to my conclusions. His objections were stated in several papers in the Transactions of the Royal Society.

There were some circumstances, that made me feel considerable

confidence in my results; but, in a matter so difficult, and in which the quantities in dispute were so small, I was unwilling to do more than repeat an account of my observations, and give my reasons for calling in question Mr. Pond's conclusions. This was done in a paper published also in the *Phil. Trans.* for 1818.

I then determined to institute a very extensive series of observations for examining this question in various ways.

The results of a great number of observations made with our eight feet astronomical circle, during upwards of three years, were given in the *Phil. Trans.* for 1821. These, when duly considered, must be allowed to have added great weight to my former conclusions; but there still appeared to be wanting those convincing arguments, that were to be desired in a matter of such importance, and which had so long baffled the exertions of astronomers. Besides, results were obtained with respect to several stars, that appeared to involve the enquiry in new difficulties.

The observations have been continued, and it has recently occurred to me, that, from the great number of observations, which have been made of certain stars, I could apply them to finding the *solar nutation*, as well as the *parallax* and *aberration*.

The solar nutation deduced from theory has long been used by astronomers in the correction of the observations in north polar distance. No doubt remains of its actual quantity within narrow limits. Its maximum is very nearly half a second in north polar distance for all stars. This quantity, less than what I had found for the parallax of certain stars, would, I considered, if ascertained by my observations, shew the exactness of them, and the capability of the instrument to point out such small quantities.

The solar nutation goes through all its states twice in the course of a year; therefore it appears impossible to suppose, that, if any

cause should occasion the instrument to shew deviations explained by parallax which did not actually exist, it should not derange the solar nutation, and cause the result of an investigation of its quantity to turn out quite erroneous.

This method of investigation, which I have applied to several stars, has produced most satisfactory results.

There will not, I conceive, remain the smallest doubt with any one, who examines the processes which have been used, that the observations have ascertained the quantities of parallax, with considerable exactness, of the stars α *Lyræ*, α *Cygni*, and *Arcturus*, and that the parallaxes of γ *Draconis* and η *Ursæ Majoris* are extremely small. That γ *Draconis* is at least seven or eight times more distant than α *Lyræ*.

The application of the same method to α *Aquilæ* and α *Ophiuchi* has shewn, that the conclusions formerly deduced from the observations of these stars cannot be depended on. There appear reasons for supposing, that the parallax of these stars may be considerable; but, for the present, I am willing to leave the matter entirely in doubt. The great zenith distances of these stars appear to have been attended with an irregularity of refraction, which has mixed itself with the other changes of place; as will be more particularly considered, when the computations as to α *Aquilæ* are stated.

The results of this enquiry are connected with several important points in practical astronomy. It has not before been attempted, as far as I know, to ascertain by actual observation the quantity of solar nutation. The precision with which this equation, mixed up with the other various complicated apparent motions, has been ascertained, shews an advanced state of instruments that formerly would scarcely have been hoped for.—Newton, who pointed out from theory the existence of the solar nutation, (the lunar so much

larger escaped his notice,) speaks of it as “vix aut ne vix quidem sensibilis.”

The existence of a visible parallax in N. P. D. in certain stars, in one at least greater than the solar nutation, that has so long been adopted by astronomers, will be considered to add to the troublesome corrections already used in finding the mean place of a star. It is true, that, with respect to polar distances, it is probable this correction may be sensible only in a few stars; but it may be quite otherwise as to the right ascensions of stars near the ecliptic. Then, unless it be attended to in deducing the catalogue of right ascensions, considerable inaccuracy will take place. May not this have been the source whence the differences have arisen in the recent determinations of right ascension, deduced from observations made with the best instruments?

Should it be necessary to consider the constant of aberration as unknown, there will be required, for settling the relative places in right ascension of two stars only, six unknown quantities (e, x, p , for each star). Therefore it would require labour almost interminable to deduce an *exact* catalogue in right ascension of the 36 stars.

It may be said, that this exactness would be useless. If so, it must be admitted, that the right ascensions will be less exact than the polar distances.

The inconveniences that belong to the use of the transit instrument will also belong to the mural circle, unless means be used for referring the observations to the zenith point. This would probably deprive the results of several advantages intended by the adoption of mural circles. Hence a question of much importance arises, Will not the continuation of the construction of mural circles tend to impede the progress of our enquiries relative to the fixed stars?

Doubtless weighty arguments may be adduced for the constant

of aberration being the same in all stars, whether we have a reference to the undulatory or corpuscular theory of light. But neither one or other of these is necessarily true. If the corpuscular theory be adopted, some unknown properties of matter are required to explain the phenomena.—Indeed so many difficulties occur in all our reasonings relative to light, that it is desirable to avail ourselves of actual observation wherever it can be done.

The resulting constants for γ Draconis and η Ursæ Majoris appear to point out a difference, that, considering the small errors of the quantity of solar nutation deduced from each of these stars, must be thought deserving of great attention with a view to further enquiry.

To these remarks it may be added, that the results of these observations afford the indulgence of a laudable curiosity, instructing us as to the actual distance of some of the fixed stars. It is shewn that the vast abyss of space, through which the fixed stars are placed, is not, in all its parts, more remote than our means of measurement can reach.

I now proceed to state, 1. The quantity of solar nutation as deduced from theory. 2. The results of the observations of certain stars as to this quantity, parallax, and aberration.

Solar Nutation by Theory.

By a reference to the *Mecanique Celest.* p. 348, 349 and 350, Tom. 2. it will easily appear that the solar nutation in N. P. D.

$$= \frac{l \tan \text{ob. ecl.}}{2m(1+\lambda)} (\cos \text{ob. ecl.} \sin 2\odot \cos AR - \cos 2\odot \sin AR)$$

where $\frac{l}{m} = \frac{155,2}{3999930}$ and $\lambda = \frac{\text{disturb. force of the moon on the earth.}}{\text{disturb. force of the sun.}}$

If we use the lunar nutation for finding the value of λ , and suppose

the max. of nutation of the obliquity of the ecliptic = $9'',50 + y$, the same work, p. 348, gives for this

maximum $\frac{l\lambda c'}{(1+\lambda)f \sin 1''}$ when $\frac{l}{f} = \frac{155.2}{215063}$ and $c' = \tan 5^\circ 8'.48''$

Hence $\frac{1}{1+\lambda} = \frac{3,907-y}{13,407}$

Therefore $\frac{l \tan \text{ob. ecl.}}{2m(1+\lambda)} = 0'',5062 - ,1296y$

Let $z = 0'', 5062 - ,1296y$

Then the solar nutation in N. P. D = $(\cos \text{ob. ecl.} \sin 2 \odot \cos \text{A. R.} - \cos 2 \odot \sin \text{A. R.})z$.

The smallest value that has been assigned for the max. of lunar nutation of ob. ecl. is $8'',97$, which has been deduced by Lindenau.

This gives $y = -0'',52$, and therefore $z = 0'',57$.

The greatest value for this max. is that which is deduced by supposing $\lambda = 3$ as determined at first by M. Laplace, by the tides at Brest. This value of λ gives $9,50 + y = 10'',055$ and the value of $z = 0'',43$. But the illustrious author himself has shewn, that this value of λ is too great. (Mec. Cel. Tom. 3. p. 159.)

There cannot be a doubt that the value of z is between $0'',43$ and $0'',58$. According to a high degree of probability $0'',51$ is a very near value.

Taking the value of the lunar nutation deduced by my observations, as given in the Phil. Trans. 1821, the value of $z = 0'',537$.

Let us now investigate the value of z from actual observation.

Observations of α Lyræ.

The observations of the zenith distances of this star are given at length, in order that the whole process, by which the results are

obtained may be examined. For the other stars, the principal results are only given.

The observed zenith distances are reduced to the mean zenith distance, Jan. 1, 1819, by applying the usual equations with the contrary sign.

1. The precession in N. P. D. the annual value of which is $-3''\text{,}00$
2. The aberration, the constant of which is $20''\text{,}25$
3. The solar nutation = $0''\text{,}48 \sin(2 \odot \text{ Long.} - \text{A.R.})$
4. The lunar nutation = $8''\text{,}28 \sin (\text{A.R.} - \Omega) - 1''\text{,}22 \sin (\text{A.R.} + \Omega)$
5. The refraction has been computed by my Table given in vol. 12.

The sum of these five equations, according to their signs, is called the sum of the equations.

A mean of a considerable number of observations, made throughout the year, and reduced to January 1, 1819, gives the zenith distance = $14^\circ. 41'. 56''\text{,}41$. This must be nearly equal to the mean zenith distance.

Let the correct mean zenith distance = $14^\circ. 45'. 56''\text{,}41 - e$

$p =$ semi-parallax

$20''\text{,}25 + x =$ constant of aberration

$z =$ the constant of solar nutation, the coefficient of which is above given.

Hence, if m be the mean zenith distance determined by the observation of any one day, reduced by the sum of four equations, *omitting* the solar nutation, and supposing its quantity unknown, we obtain an equation of the form

$$m + fx + gp + hz = 14^\circ. 45'. 56''\text{,}41 - e$$

or, making $m - 14^\circ. 45'. 56''\text{,}41 = k$

$$e + fx + gp + hz + k = 0$$

We thus obtain *an equation of condition* for each day.

On those days, in which two observations were made, one with the face of the circle East and one with the face West, one equation is considered equivalent to two deduced from observations made on different days. Indeed, since the method of observing off the meridian has been generally adopted here, the result of two observations of one day appears, as might be expected, more exact than the mean of two observations on different days.

The equations of condition, in number 208, thus obtained, are given at the end of this paper; and, doubling those when the circle was reversed, the number amounts to 333.

These have been reduced to four equations, by the method of making the sum of the squares of the errors a *minimum*, viz. making

$$(e + fx + gp + hz + k)^2 + (e + f'x + g'p + h'z + k')^2 + \&c. \text{ a min.}$$

Taking the fluxions of these quantities, making $e, x, p,$ and z vary separately, we obtain four equations.

$$1. \quad \left. \begin{array}{l} 1 \\ \&c \end{array} \right\} e + \left. \begin{array}{l} f \\ \&c \end{array} \right\} x + \left. \begin{array}{l} g \\ \&c \end{array} \right\} p + \left. \begin{array}{l} h \\ \&c \end{array} \right\} z + \left. \begin{array}{l} k \\ \&c \end{array} \right\} = 0$$

$$2. \quad \left. \begin{array}{l} f \\ \&c \end{array} \right\} e + \left. \begin{array}{l} f^2 \\ \&c \end{array} \right\} x + \left. \begin{array}{l} fg \\ \&c \end{array} \right\} p + \left. \begin{array}{l} fh \\ \&c \end{array} \right\} z + \left. \begin{array}{l} fk \\ \&c \end{array} \right\} = 0$$

$$3. \quad \left. \begin{array}{l} g \\ \&c \end{array} \right\} e + \left. \begin{array}{l} fg \\ \&c \end{array} \right\} x + \left. \begin{array}{l} g^2 \\ \&c \end{array} \right\} p + \left. \begin{array}{l} gh \\ \&c \end{array} \right\} z + \left. \begin{array}{l} gk \\ \&c \end{array} \right\} = 0$$

$$4. \quad \left. \begin{array}{l} h \\ \&c \end{array} \right\} e + \left. \begin{array}{l} fh \\ \&c \end{array} \right\} x + \left. \begin{array}{l} gh \\ \&c \end{array} \right\} p + \left. \begin{array}{l} h^2 \\ \&c \end{array} \right\} z + \left. \begin{array}{l} hk \\ \&c \end{array} \right\} = 0$$

The coefficients appertaining to e , x , &c. in each equation being added together, we have

$$1. \quad 333e + 49,04x - 43,96p + 24,52z + 36,33 = 0$$

$$2. \quad 49,04e + 117,4032x + 36,4579p - 9,0401z - 48,2507 = 0$$

$$3. \quad -43,96e + 36,4579x + 140,2564p - 25,7204z - 150,7903 = 0$$

$$4. \quad 24,52e - 9,0401x - 25,7204p + 180,7742z - 60,9190 = 0$$

The solution of these equations give

$$z = + 0'',5055 *$$

$$p = + 1,1380$$

$$x = + 0,1011$$

$$e = - 0,0110$$

The exactness of this value of z affords exceeding strong presumption, that the values of e , x and p , are also very exact.

But the supposition of z being unknown has the effect of rendering the number of observations used only equivalent to a smaller number when z is considered as known. It is evident the greater the number of quantities that are to be determined from a series of observations, the greater is the number of observations that will be required to give equal exactness. Thus, if e and p only are to be found, a smaller number of observations will give e and p exact: that is, the errors of observation will have less effect than if e , p and x are considered unknown; and if e , p and x only are to be found, the results are likely to be more exact from the same observations than if e , p , x , and z are to be found.

Therefore, although four quantities have been investigated from the above 333 observations, yet as one of them, z , was before known, it is likely the result will be more exact taking this

* Four places of decimals have been retained in the multiplication of the coefficients, that, as far as computation is concerned, the values of e , x , p , and z , may be exact to the second decimal place.

as known. Then the *three* final equations, obtained by the above method, will be

1. $333e + 49,04x - 43,96p + 48,51 = 0$
2. $49,04e + 117,4032x + 36,4577p - 52,3657 = 0$
3. $-43,96e + 36,4579x + 140,2564p - 162,3572 = 0$

These equations give

$$p = + 1'', 1277 \text{ or } 2p = 2'', 25$$

$$x = + 0, 1007 \text{ or constant of aberration} = 20'', 35$$

$$e = -0,0116 \text{ or mean N. P. D. Jan. 1, 1819} = 51^\circ. 22' 42'', 92$$

Here the differences resulting from supposing z known and unknown are not worth notice.

Observations of γ Draconis.

For this star the mean zenith distance Jan. 1, 1819, has been supposed $= 1^\circ. 52' 21'', 13 - e$.

p , x , and z represent as before. The number of observations are 199.

The four resulting equations, deduced in the manner that has been explained at considerable length, and by a reference to the observations for α Lyræ, are

1. $199e + 48,76x - 28,90p + 22,44z - 16,27 = 0$
2. $48,76e + 82,5802x + 35,8977p - 20,9436z + 39,9305 = 0$
3. $-28,90e + 35,8977x + 101,6398p - 24,9353z + 26,4376 = 0$
4. $22,44e - 20,9436x - 24,9353p + 92,5526z - 51,8999 = 0$

These equations give

$$z = +0'', 4246$$

$$p = +0,0704$$

$$x = -0,5056$$

$$e = +0,1681$$

This value of z may be considered as not differing more than $\frac{1}{10}$ of

a second from the truth ; and therefore it may fairly be concluded, that the errors of p and x are not much greater.

The values obtained from the *three* equations deduced by supposing the solar nutation known are probably more exact. These equations are

$$1. \quad 199e + 48,76x - 28,90p - 5,77 = 0$$

$$2. \quad 48,76e + 82,5802x + 35,8977p + 23,9894 = 0$$

$$3. \quad -28,90e + 35,8977x + 101,6388p + 18,6693 = 0$$

The solution gives

$$p = -0",0332$$

$$x = -0,3395 \text{ or const. of aberration} = 19",91$$

$$e = +0,1074 \text{ or mean N. P. D. Jan. 1, 1819} = 38^\circ 29' 7",52.$$

The small negative value of p , arising from the unavoidable effect of the errors of observation, seems to shew, that the value of p does not amount to $\frac{1}{10}$ of a second ; and therefore, that this star is ten times more remote than α Lyræ.

I am aware, that to many it will appear almost absurd to rely on these small fractions of a second—I hope they will not adhere to this opinion without carefully examining the steps, by which these conclusions have been obtained.

Observations of η Ursæ Majoris.

For this star the mean zenith distance Jan. 1, 1819, has been supposed = $3^\circ. 10'. 0''$, $60 - e$

The four resulting equations that have been deduced as before, from 144 observations, are

$$1. \quad 144e + 15,63x - 6,99p + 64,56z - 19,07 = 0$$

$$2. \quad 15,63e + 42,2115x + 25,5393p - 8,2082z - 13,1740 = 0$$

$$3. \quad -6,99e + 25,5393x + 71,0775p - 9,4177z - 13,4576 = 0$$

$$4. \quad 64,56e - 8,2082x - 9,4177p + 60,8238z - 19,8381 = 0$$

$$\begin{aligned}z &= +0'',5782 \\p &= +0,0950 \\x &= +0,4295 \\e &= -0,1688\end{aligned}$$

This value of z also may be considered as not differing $\frac{1}{10}$ of a second from the truth. *

Taking the solar nutation $=, 48 \sin (2\circ - \text{A.R.})$ as known, the three equations are

$$\begin{aligned}(1) \quad & 144e + 15,63x - 6,99p + 13,76 = 0 \\(2) \quad & 15,63e + 42,2115x + 25,5393p - 17,6855 = 0 \\(3) \quad & -6,99e + 25,5393x + 71,0775p - 18,5022 = 0\end{aligned}$$

Then

$$\begin{aligned}p &= +,1003 \text{ or } 2p = 0'',20 \\x &= +,4083 \text{ or const. aberr.} = 20'',66 \\e &= -1350 \text{ or mean N. P. D. Jan. 1, 1819} = 39^\circ 46' 47'',23.\end{aligned}$$

It appears difficult to imagine, that the results relative to the constants of aberration for this star and γ Draconis, considering the exactness of the values of z , should be so inexact as to differ by $\frac{3}{4}$ of a second, if they were really the same. The different values of the constant of aberration for these two stars appear to shew an actual difference in the velocities of the light of the two stars.

* The observations of this star were not made at the times best adapted for giving the value of z . The original intention being only to ascertain x and p , the observations were made as far as could be done when the coefficients of x and p were considerable as to both positive and negative values. In consequence of this, it has happened, that, for several high stars, the observations that have been made cannot be applied to find z . In this star, η Ursæ Majoris, the coefficient of z in the first equation being so great as $+64,56$ in only 144 observations shews that they have been principally made when the coefficients of z were positive. The consequence is, that z has a tendency to confound itself with e . However, in this instance, this inconvenience has not arisen. For α Lyræ, γ Draconis, α Cygni, and α Aquilæ, the observations are as well adapted for finding z as for finding x or p .

Observations of α Cygni.

For this star the mean zenith distance Jan. 1, 1819, has been supposed = $8^{\circ}.44' 55''.60 - e$.

The four resulting equations that have been deduced from 228 observations are

1. $228e + 54,80x - 34,64p - 22,22z + 83,00 = 0$
2. $54,80e + 91,4964x + 26,9658p - 15,4834z + 3,0558 = 0$
3. $-34,64e + 26,9658x + 92,0096p - 34,2084z - 37,2714 = 0$
4. $-22,22e - 15,4834x - 34,2084p + 98,1338z - 42,1174 = 0$

Whence

$$z = +0'',5572$$

$$p = +0,5003$$

$$x = +0,0624$$

$$e = -0,2487$$

Here also the value of z comes out considerably exact.

The *three* equations for obtaining probably more exact values of p , x and e , are

1. $228e + 54,80x - 34,64p + 72,94 = 0$
2. $54,80e + 91,4964x + 26,9658p - 4,9208 = 0$
3. $-34,64e + 26,9658x + 92,0096p - 53,6798 = 0$

Therefore

$$x = +0'',0802 \text{ or const. aberr. } 20'',33$$

$$p = +0,4584 \text{ or } 2p = 0'',92$$

$$e = -0,2696 \text{ or mean N. P. D. Jan. 1, 1819} = 45^{\circ} 21' 42'',37$$

The value of the semi-parallax is probably exact to $\frac{1}{10}$ of a second.

Observations of Arcturus.

The mean zenith distance of this star Jan. 1, 1819, has been supposed = $33^{\circ} 15' 27'', 20 - e$.

The four equations resulting from 348 observations made on 115 days, are

1. $348e + 33,64x - 16,36p + 126,28z - 76,96 = 0$
2. $33,64e + 39,9964x + 11,3856p - 47,7996z + 25,8384 = 0$
3. $-16,36e + 11,3856x + 90,0412p - 10,8096z - 47,1152 = 0$
4. $126,28e - 47,7996x - 10,8096p + 238,8556z - 134,9456 = 0$

Hence

$$\begin{aligned} z &= +0,4430 \\ p &= +0,6524 \\ x &= -0,4123 \\ e &= +0,1309 \end{aligned}$$

The value of z is exact to less than $\frac{1}{10}$ of a second, notwithstanding the observations were not made at the times most favourable for finding the value of z . This will appear from a comparison of the coefficients of z in equation 1 and equation 4. The coefficients of x in equation 1 and equation 2 also shew, that these observations are still more unfavourable for finding the exact value of x . The coefficients of p in equation 1 and equation 3 shew, on the contrary, the equations are well adapted for finding the value of p .

The *three* equations giving probably more exact values are

1. $348e + 33,64x - 16,36p - 13,96 = 0$
2. $33,64e + 39,9964x + 11,3856p + 1,6388 = 0$
3. $-16,36e + 11,3856x + 90,0412p - 52,4356 = 0$

These give

$$\begin{aligned} p &= +0'',6393 \text{ or } 2p = 1'',28 \\ x &= -0'',3069 \text{ or const. aberr. } 19'',94 \\ e &= +,0999 \text{ or mean N. P. D. Jan. 1, 1819} = 69^{\circ} 52' 13'', 60 \end{aligned}$$

Observations of α Aquilæ.

The equations resulting from the observations of this star do not give the value of z nearly exact. The equations resulting from 395 observations made in 154 days, are

1. $395e + 58,43x - 7,77p - 63,21z - 21,28 = 0$
2. $58,43e + 64,9925x + 18,9386p - 15,1838z - 85,4772 = 0$
3. $-7,77e + 18,9386x + 40,9277p - 14,3921z - 74,0507 = 0$
4. $-63,21e - 15,1838x - 14,3921p + 184,8813z - 132,5715 = 0$

These give

$$\begin{aligned} z &= +0'',9643 \\ p &= +1,7311 \\ x &= +0,9438 \\ e &= +0,1027 \end{aligned}$$

It is evident, from this value of z , that some irregularity from an unknown source has taken place.

The five stars, that have been before examined, are all, with the exception of Arcturus, within a few degrees of the zenith; and any irregularity of refraction, that may have existed, cannot be supposed to have affected the results deduced from so many observations.

The zenith distance of α Aquilæ being 45° the observations may be supposed to have been affected by the irregularities of refraction, which there is reason to suppose become, so far from the zenith, considerable in respect to the small quantities which are the objects of our research. However, it might also be supposed these effects would disappear in the results deduced from so many observations; but it is to be considered, that *four* unknown quantities are to be found from these observations.

Another important circumstance is to be taken into account, that the same irregularity of refraction takes place in four observations of the same day ; this therefore reduces the above number of observations to the number of days, as far as refraction is concerned. This must have considerable effect as to the values of $z, x, p,$ and $e,$ in the four resulting equations. In consequence it is my intention in future, as to this star, to endeavour to increase the number of days of observation, and take only two observations on the same day.

In my paper in the *Phil. Trans.* 1821, I mentioned a difficulty, as to stars of considerable zenith distance, that occurred respecting the internal and external Thermometer, and stated my reasons for adhering to the use of the internal Thermometer. In the present case, it seemed desirable to examine the effects of computing the refraction by the external Thermometer, and the importance of the result appeared sufficient to compensate for the length of the calculation. The last terms of the above four equations were changed into

1. + 143,86
2. — 44,8546
3. — 60,8347
4. — 168,6283

Then

$$\begin{aligned} z &= +0',9860 \\ p &= +1,4218 \\ x &= +0,7689 \\ e &= -0,2921 \end{aligned}$$

Nothing is here gained as to the value of $z,$ and therefore the use of the internal Thermometer cannot have occasioned the difficulty.

In consequence of these values of $z,$ for the present it appears better to suspend all conclusions as to the values of p and the con-

stant of aberration for this star, although it by no means follows, that the values given by the *three* equations are considerably erroneous.

The *three* equations are

1. $395e + 58,48x - 7,77p - 50,83 = 0$
2. $58,43e + 64,9925x + 18,9386p - 92,7675 = 0$
3. $-7,77e + 18,9386x + 40,9277p - 81,6417 = 0$

And

$$\begin{aligned} p &= +1'',5544 \\ x &= +0,9588 \\ e &= +0,0175 \end{aligned}$$

If we suppose $x=0$ or the constant of aberration = $20'',25$ as to this star, as was done in the computation of the observations in the 12th Volume of the Transactions of the Academy, the equations are reduced to

$$\begin{aligned} 395e - 7,77p - 50,83 &= 0 \\ -7,77e + 40,9277p - 81,6417 &= 0 \end{aligned}$$

and $p = 2'',03$ or $2p = 4''$

This value of p shews, that the results of the new series of observations do not appear to differ materially from those in the 12th Volume above cited, when it is considered that many of those observations were made when the coefficients of p were very small (in this star it never exceeds, 52). This coincidence between the present results and the former result seems to imply a constant cause for the discordance, such as that of parallax; or perhaps that which is thought to be an irregularity of refraction, may follow some law hereafter to be discovered.

Notwithstanding the numerous observations of this star that have been made here, it is obvious a much greater number

will be required to clear up the difficulties that have occurred as to this and other low stars. It is my intention to pursue the subject. If an opportunity should be afforded me, by continuing the observations, of ultimately succeeding, I hope it will be considered that the time consumed has not been mispent.

As to the parallaxes of stars near the zenith, there cannot I think be a doubt, that they have been determined by this enquiry to the exactness of a small fraction of a second.

Table I. Containing the observations and reductions of α Lyræ almost explains itself.

The observations from the commencement to September 20, 1819, were all made on the meridian. The mean of the three microscopes being taken, and the correction for collimation or index error being applied, and also the sum of the equations, the mean zenith distance Jan. 1, 1819, is obtained. The refraction is computed by the internal Thermometer.

The corrections of the mean of the three microscopes, for collimation or index error, were as follows for the *single* observations:

			Face W.
1818	July 14	—	Aug. 16 +54,76
1818	Oct. 16	—	Nov. 8 +47,81
1818	Nov. 24	—1819,	Feb. 24 +43,67
1819	July 3	—	Augt. 27 +46,91
1819	Aug. 31	—	Nov. 8 +46,35

The marks ** in the dates signify, that the error of collimation was changed at that time.

The amount of the correction for the mean of the three microscopes was not changed between the 17th and 19th October 1818; but the relative position of the right and left microscopes was changed, in consequence of an adjustment of the horizontal axis of the circle.

From September 20, 1819, with the exception of a few observations, the observations were made off the meridian. One observation was made a few minutes before the time of coming to the meridian, and the other after the passage over the meridian, the instrument having been reversed. The position of the face of the instrument, whether east or west, is marked with the reading of the bottom microscope.

This method of observing off the meridian is considered to have rendered the observations more exact.

The zenith distance is obtained by the mean, without any correction for collimation, and without danger of a change in collimation, from an interval of some days having occurred.

This method adds considerably to the trouble of computation, but that is of no consequence compared with the other advantages.

I prefer making the computation of the corrections by Logarithms to taking the numbers out of a table.—If P be the distance in time from the meridian reduced to seconds, then in Lat. $53^{\circ}.23'13''.5$.

$$\log. 1st. corr. = 6,51230 + \log. \sin. N. P. D. + \operatorname{cosec}. Z. D. + 2 \log P$$

$$\log. 2d. corr. = 7,1564 + \log. \sin. N. P. D. + \operatorname{cosec}. Z. D. + 4 \log P$$

$$\log. 3d. corr. = 2 \log. 1st. corr. + 4,38454 + \operatorname{cotan}. Z. D.$$

$$(\text{Above Pole}) \operatorname{Mer. Z. D.} = \text{observation} - (1st\ corr - 2d\ corr - 3d\ corr.)$$

$$(\text{Below Pole}) \operatorname{Mer. Z. D.} = \text{observation} + (1st\ corr - 2d\ corr + 3d\ corr.)$$

The 2d and 3d corrections are very small, and may easily be con-

tained in a small table for a given star. The 2d correction is introduced on account of taking out in the first correction the log of P instead of the log sin of P reduced to seconds of space. This method somewhat facilitates the computation.

Table II. Contains the equations of condition for finding $e, x, p, & z$. The column of mean zenith distance, Table I. is to be corrected by taking away the solar nutation, which is found with a contrary sign in Table III. To this quantity so corrected are applied the parallax, correction of aberration, and solar nutation, found in terms of $p, x,$ and z , by help of Table III. where the coefficients of those quantities are given. The result is equal to $14^{\circ}.45'56'',41-e$.

Thus, for Aug. 1, 1821, Tab. I. M. Z. Dist. $14^{\circ} 45'55'',81$

Tab. III. Solar Nut. $- 0,17$

$$\hline 14^{\circ} 45'55'',64+,48x+,74p+,35z$$

$$= 14^{\circ} 45'56'',41-e$$

Hence, $e+,48x+,74p+,35z-0,77=0$ vid. Aug. 1, 1821, Tab. II.

Table III. Is given principally to facilitate the formation of the equations of condition. The solar nutation used is put down with a contrary sign, and therefore, being applied to the sum of the equations in Table I. the result does not contain the solar nutation.

TABLE I.

Observations and reductions of the Zenith Distances of α Lyræ.

Date of observation	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope		Right hand Micr.	Sum of Equations	Mean Z. Dist. Jan. 1, 1819.		Bar.	Therm.	
			o	' "			o	' "		o	' "	Int.	Ext.
1818											
July 14	- -	45 8,2	14 44	55,4 W	44 23,4	+ 10,74	14 45 54,50	30,10	65	59	
15	- -	46 20,7	14 46	32,4 E	47 3,6	10,89	55,03	30,05	67½	64	
16	- -	45 8,4	14 44	55,9 W	44 23,4	11,12	55,11	30,00	69	65	
17	- -	45 5,4	14 44	53,0 W	44 21,0	11,39	52,62	29,87	66	60	
19	- -	46 18,3	14 46	29,5 E	47 1,0	12,15	53,66	29,89	59	50	
24	- -	46 19,3	14 46	31,0 E	47 2,0	13,08	55,75	29,57	67	62½	
25	- -	46 14,5	14 46	28,0 E	47 0,1	13,54	52,98	29,54	60½	53	
27	- -	45 3,7	14 44	51,7 W	44 19,5	14,26	53,99	29,97	60	51½	
Aug. 1	- -	46 17,0	14 46	28,3 E	47 2,2	15,45	56,52	29,97	61½	55	
2	- -	45 2,0	14 44	52,8 W	44 19,5	15,65	55,18	29,83	61	57	
6	- -	46 12,5	14 46	24,5 E	46 59,0	16,53	53,77	29,94	62½	55	
7	- -	45 3,5	14 44	52,6 W	44 20,0	16,80	56,93	29,86	60	55	
9	- -	45 2,5	14 44	51,6 W	44 18,3	17,29	56,18	29,83	57½	50	
10	- -	46 13,1	14 46	25,6 E	46 58,2	17,56	55,10	29,94	58	53	
11	- -	45 0,8	14 44	49,6 W	44 17,6	17,79	55,22	29,99	58	53	
12	- -	46 14,5	14 46	25,8 E	46 57,8	18,00	55,94	29,97	58	53	
13	- -	45 0,0	14 44	49,5 W	44 16,5	18,21	54,97	30,00	59	53	
14	- -	46 13,0	14 46	25,3 E	46 57,7	18,36	55,60	30,00	59½	53½	
15	- -	45 0,3	14 44	49,2 W	44 15,3	18,54	54,90	29,98	59½	53	
** 16	- -	46 13,5	14 46	24,2 E	46 56,2	18,67	55,21	29,93	60	54	
Oct. 16	- -	45 7,0	14 44	54,8 W	44 20,2	22,37	57,51	29,62	57	53½	
** 17	- -	46 4,7	14 46	17,1 E	46 50,1	22,39	58,55	29,77	56	54	
19	- -	44 48,6	14 44	52,3 W	44 37,0	22,11	55,89	29,57	56	55	
20	- -	46 20,0	14 46	14,4 E	46 30,0	22,06	55,72	29,75	58	57	
26	- -	46 22,3	14 46	17,7 E	46 32,5	21,51	57,87	29,75	54½	55	
Nov. 2	- -	44 51,4	14 44	55,8 W	44 39,5	20,37	57,08	29,40	56	54	
3	- -	46 21,0	14 46	15,7 E	46 33,1	20,18	55,64	29,27	55	52	
7	- -	46 21,7	14 46	18,0 E	46 33,4	19,75	56,31	29,48	50	49½	
8	- -	44 52,3	14 44	56,3 W	44 39,4	19,62	56,76	29,61	50	50	
** 24	- -	44 56,2	14 44	59,5 W	45 0,0	16,09	58,33	29,47	51½	49½	
Dec. 5	- -	46 27,1	14 46	24,0 E	46 28,7	13,38	56,31	29,12	42	39	
7	- -	45 0,6	14 45	3,5 W	45 1,0	12,65	58,02	29,03	46	44	
9	- -	46 29,8	14 46	26,3 E	46 29,0	12,60	57,30	29,81	43	42	
15	- -	45 1,6	14 45	2,0 W	44 57,3	10,95	54,92	29,83	40	36½	
16	- -	46 30,7	14 46	29,6 E	46 31,7	10,68	57,68	29,83	39	39	

TABLE I.—CONTINUED.

α Lyrae.

Date of observation	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.			Right hand Micr.	Sum of Equations.	Mean Z. Dist. Jan. 1, 1819.			Bar.	Therm.	
			'	"	o			'	"	'		"	o	'	"	Int.	Ext.
1818		' "	o	'	"	' "							
Dec. 21	- -	45 1,5	14	45	3,3 W	44 59,0	+	9,04	14 45 53,98	29,94	45	42½	
22	- -	45 3,6	14	45	4,8 W	45 1,8		8,94	56,01	30,16	42	41	
1819													
Jan. 8	- -	45 10,0	14	45	14,7 W	45 12,5		2,56	58,63	28,84	44	44	
10	- -	46 39,6	14	46	34,8 E	46 37,2		2,28	55,81	29,27	40	39	
11	- -	45 7,7	14	45	12,8 W	45 10,2		2,07	55,97	29,57	42½	46	
12	- -	46 40,0	14	46	35,9 E	46 39,2		1,80	56,50	29,54	41	38	
17	- -	45 12,3	14	45	15,0 W	45 12,6		0,34	57,31	29,42	37	36	
18	- -	46 40,8	14	46	37,5 E	46 40,8	+	0,03	56,06	29,46	37½	40½	
19	- -	45 13,3	14	45	16,4 W	45 13,7	-	0,26	57,88	29,25	34	34	
20	- -	46 41,4	14	46	38,8 E	46 42,0		0,63	56,43	29,20	35	34½	
25	- -	46 42,2	14	46	40,0 E	46 43,4		2,09	56,11	29,06	34	33	
29	- -	45 15,6	14	45	19,8 W	45 15,8		3,28	57,46	29,17	38	39½	
31	- -	45 15,5	14	45	18,3 W	45 14,9		3,57	56,33	29,31	32½	30	
Feb. 1	- -	46 42,4	14	46	40,9 E	46 45,8		3,69	55,67	29,37	30	27½	
5	- -	45 17,7	14	45	20,0 W	45 17,0		5,11	56,79	29,19	39	40	
6	- -	45 18,5	14	45	20,7 W	45 17,0		5,30	57,10	29,07	35½	35	
9	- -	46 47,3	14	46	44,2 E	46 48,1		5,87	56,99	29,49	37	36	
21	- -	46 49,1	14	46	45,7 E	46 49,0		8,16	56,10	29,72	37½	35	
24	- -	45 21,5	14	45	24,0 W	45 20,5	-	8,51	57,16	29,72	33	30	
July 3	- -	46 30,9	14	46	27,4 E	46 31,7	+	9,37	52,46	29,48	56½	51	
4	- -	44 58,3	14	45	1,7 W	44 57,4		9,69	55,73	29,54	56	51	
** 14	- -	46 27,4	14	46	23,2 E	46 34,9		12,56	54,15	29,89	63	57	
15	- -	44 55,9	14	45	1,4 W	44 50,7		12,70	55,61	29,87	64½	58½	
20	- -	46 26,5	14	46	23,2 E	46 34,7		14,24	55,46	29,48	55	47½	
21	- -	44 54,4	14	45	0,0 W	44 49,0		14,52	55,90	29,76	59	53	
21	- -	46 26,1	14	46	21,7 E	46 33,6		15,32	55,51	29,90	63	57	
28	- -	44 50,2	14	44	56,0 W	44 45,1		16,39	53,73	30,03	63½	56	
29	- -	46 24,1	14	46	20,0 E	46 31,8		16,56	54,95	29,96	64	59	
30	- -	44 50,3	14	44	56,0 W	44 45,0		16,72	54,06	29,93	66	60	
Aug. 2	- -	44 50,0	14	44	55,9 W	44 45,2		17,40	54,68	29,80	67	61	
4	- -	46 23,1	14	46	18,5 E	46 29,3		17,92	54,64	29,79	64½	57½	
7	- -	44 47,8	14	44	54,7 W	44 43,4		18,61	54,13	29,83	65	58	
9	- -	46 22,9	14	46	18,0 E	46 29,4		19,05	55,57	29,91	66	59	
15	- -	44 44,6	14	44	51,0 W	44 40,1		20,32	52,46	29,92	66	62	
18	- -	46 21,8	14	46	16,5 E	46 27,3		20,89	55,85	30,09	67½	61	

TABLE I.—CONTINUED.

α *Lyræ*.

Date of observation.	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.		Right hand Micr.	Sum of Equations.	Mean. Z. Dist. Jan. 1, 1819.		Bar.	Therm.	
										Int.	Ext.
1819	' "	' "	o	' "	' "	"	o	' "			
Aug. 19	- -	44 46,3	14 44	53,3W	44 43,4	+ 21,03	14 45	55,61	30,01	68	61½
21	- -	46 20,6	14 46	15,0 E	46 25,5	21,44		54,90	29,98	66	59
23	- -	44 46,4	14 44	52,0W	44 40,7	21,76		55,04	29,97	67½	61
27	- -	46 17,9	14 46	12,7 E	46 22,0	22,40		52,02	29,80	63	58
31	- -	44 50,0	14 44	52,8W	44 40,7	22,96		57,14	29,15	53	47
Sept. 8	- -	44 48,4	14 44	52,5W	44 40,8	23,84		57,42	29,79	64½	61½
10	- -	44 46,4	14 44	52,0W	44 41,6	24,23		57,25	29,91	60½	54
Sept. 12	- -	46 17,2	14 46	11,6 E	46 21,9	24,48		55,03	30,03	61	57
14	- -	46 14,2	14 46	9,6 E	46 21,0	24,56		53,14	29,93	62	55½
16	- -	44 44,5	14 44	50,2W	44 38,6	24,91		55,69	29,82	52½	47
20	5 23,4 1 41,6	48 0,6 44 51,9	14 48 14 44	0,7 E 57,6W	48 15,1 44 47,4	25,29		56,91	30,22	55	48
21	- -	46 15,0	14 46	10,5 E	46 23,0	25,28		55,10	30,25	55	49½
22	- -	44 43,0	14 44	49,0W	44 38,2	25,32		55,07	30,12	55½	50
23	- -	44 44,3	14 44	48,4W	44 38,3	25,22		55,24	29,83	56	51
Oct. 2	5 35,9	46 36,0	14 46	41,3W	46 30,7	25,00		55,84	29,28	59½	57
4	11 25,1 4 45,2 4 32,8	54 0,6 46 5,3 47 32,4	14 53 14 46 14 47	59,5 E 10,2W 28,0 E	54 12,2 46 0,6 47 39,5	25,27		56,98	29,55	53½	46
17	- -	46 19,2	14 46	14,5 E	46 25,1	25,04		58,29	30,13	48½	46
20	2 26,3 4 12,7	45 6,5 47 21,8	14 45 14 47	10,2W 19,8 E	44 59,8 47 32,1	24,38		56,91	29,40	50	47
29	- -	46 18,0	14 46	16,2 E	46 29,2	23,70		58,48	29,50	41	41
30	- -	44 48,8	14 44	52,1W	44 40,3	23,59		57,01	29,70	43½	44
Nov. 2	- -	46 17,5	14 46	16,2 E	46 30,1	23,13		58,05	29,57	13½	42½
8	- -	44 48,6	14 44	52,8W	44 41,1	22,22		56,07	29,59	40	38½
Dec. 13	3 8,9 3 40,7	45 33,6 47 14,5	14 45 14 47	35,6W 14,1 E	45 24,5 47 25,4	14,07		56,73	29,68	36	34
15	3 49,9	45 52,1	14 45	53,4W	45 41,3	13,30		56,67	29,27	35	35
16	2 49,5 4 43,5	46 55,7 46 18,0	14 46 14 46	56,0 E 20,9W	47 9,3 46 10,3	13,23		56,60	29,59	33½	36½
23	10 33,3 2 36,3	51 34,2 46 54,9	14 51 14 46	36,7W 54,0 E	51 26,5 47 4,6	10,67		57,26	29,14	39	36

α Lyrae.

Date of observation.	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.	Right hand Micr.	Sum of Equations.	Mean Z. Dist. Jan. 1, 1819.	Bar.	Therm.	
								Int.	Ext.
1819	" "	" "	" "	" "	" "	" "			
Dec.	26	6 55,8	47 58,7	14 47 58,4W	47 46,2	+ 9,94	14 45 58,33	29,15	34½ 32
		3 42,3	45 54,1	14 45 55,6W	45 43,2				
		3 39,7	47 17,1	14 47 19,4 E	47 33,6				
		6 10,2	48 45,0	14 48 46,3 E	49 0,5				
	29	4 45,5	46 27,5	14 46 28,2W	46 17,2	9,36	58,45	29,53	30 26
		4 3,5	47 30,0	14 47 30,1 E	47 42,5				
	30	5 26,6	46 53,8	14 46 54,5W	46 41,5	8,45	58,64	29,07	32 31
		5 26,7	48 17,2	14 48 18,9 E	48 33,0				
1820									
Jan.	24	13,1	47 35,7	14 47 37,7 E	47 49,6	7,92	58,33	29,58	27½ 27
		4 51,4	46 30,1	14 46 32,0W	46 22,7				
	5	29,3	46 57,1	14 46 56,8W	46 43,6	6,85	57,76	29,88	36½ 37
		4 1,7	47 32,7	14 47 31,9 E	47 43,0				
	15	3 17,8	47 16,4	14 47 16,4 E	47 27,3	3,90	58,24	29,50	27 26
		3 18,7	45 48,1	14 45 51,2W	45 41,8				
	16	4 2,9	46 9,0	14 46 11,1W	46 0,3	+ 3,44	57,87	29,35	29 27
		3 12,6	47 14,5	14 47 13,6 E	47 25,5				
March	25	7,4	48 20,2	14 48 22,3 E	48 36,2	- 6,74	57,15	29,80	30½ 27
		4 44,1	46 37,1	14 46 40,7W	46 30,5				
	8	0 30,7	45 19,5	14 45 22,8W	45 11,0	7,61	56,89	29,83	37 36
		6 56,3	49 39,8	14 49 40,8 E	49 53,5				
	19	0 52,4	46 53,3	14 46 52,2 E	47 4,3	8,15	55,75	30,05	37 29
		7 19,6	48 26,5	14 48 30,7W	48 21,5				
	22	1 11,4	46 54,2	14 46 53,8 E	47 6,5	8,77	56,10	29,00	39 37
		7 31,6	48 40,5	14 48 43,8W	48 34,5				
	24	2 57,3	47 20,5	14 47 20,3 E	47 33,0	8,53	56,35	29,04	34 31
		9 48,1	51 1,4	14 51 5,1W	50 54,1				
	25	0 1,0	46 50,3	14 46 49,8 E	47 2,3	8,68	57,30	29,17	40 42
		7 48,0	48 57,3	14 49 0,4W	48 49,8				
April	5	4 54,1	46 44,7	14 46 47,2W	46 37,3	8,33	55,62	29,00	40 35
		5 43,6	48 43,1	14 48 44,7 E	48 58,0				
	6	3 30,1	47 31,6	14 47 31,5 E	47 44,2	- 8,03	55,51	29,10	35 29½
		7 19,9	48 28,8	14 48 32,3W	48 22,5				
July	5	5 13,4	46 36,4	14 46 39,4W	46 28,9	+ 13,36	57,05	29,92	58 50
		3 35,6	47 15,7	14 47 11,8 E	47 22,6				

TABLE I.—CONTINUED.

α Lyrae.

Date of observation	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.	Right hand Micr.	Sum of Equations.	Mean Z. Dist. Jan. 1, 1819.	Bar.	Therm.	
								Int.	Ext.
1820	" "	" "	o " "	" "	" "	o " "			
July	7 ⁵ 19,0	46 35,4	14 46 39,6 W	46 29,5	+ 13,98	14 45 55,57	30,00	58½	50
	6 20,5	48 50,4	14 48 49,1 E	49 2,2					
	8 ⁴ 58,1	47 56,5	14 47 54,4 E	48 8,8	14,18	55,71	29,90	59	51½
	1 4,9	44 54,4	14 45 1,3 W	44 52,0	14,67	56,09	29,80	61	54
	10 ⁶ 9,7	47 11,1	14 47 16,0 W	47 4,8					
13	1 22,3	46 33,8	14 46 30,0 E	46 41,4	15,46	55,80	29,64	61	54
	4 53,6	47 52,7	14 47 51,0 E	48 3,1					
	4 2,4	45 48,1	14 45 54,7 W	45 45,9					
	15 ⁵ 22,2	46 32,6	14 46 37,7 W	46 27,5	16,03	54,81	29,70	61½	55
	1 16,8	46 33,9	14 46 29,2 E	46 39,7	16,63	56,88	29,20	60½	53
	18 ⁶ 52,2	49 16,2	14 49 14,0 E	49 27,2					
	3 44,8	45 39,5	14 45 46,0 W	45 37,3	16,99	57,08	29,40	61	55
	19 ⁴ 43,0	46 10,0	14 46 15,7 W	46 5,6					
	1 7,0	46 32,3	14 46 28,5 E	46 41,3	18,51	56,18	29,65	59	55
	24 ⁶ 12,0	47 6,2	14 47 12,0 W	47 1,5					
	3 6,0	47 0,3	14 46 56,0 E	47 6,9	18,83	56,10	29,69	58	53
	25 ⁵ 26,0	48 9,2	14 48 7,7 E	48 21,2					
	3 27,5	45 30,6	14 45 35,7 W	45 25,7					
Sept.	12 ² 29,1	45 2,3	14 45 6,2 W	44 54,6	27,49	56,90	29,77	65½	61
	3 58,4	47 16,2	14 47 11,1 E	47 22,6	27,75	56,17	29,52	59	54
	15 ⁵ 34,2	46 31,4	14 46 34,7 W	46 23,9					
	0 54,8	46 20,0	14 46 16,0 E	46 27,4	28,21	56,53	29,60	51	44
	18 ³ 6,4	46 51,5	14 46 48,3 E	46 59,5					
	4 5,6	45 40,3	14 45 43,0 W	45 31,7	28,11	56,03	29,21	52	48
20 ³ 16,9	45 20,3	14 45 23,3 W	45 11,3						
3 15,1	46 51,7	14 46 49,1 E	47 1,7						
Oct.	4 ⁵ 58,0	48 19,8	14 48 19,5 E	48 32,9	28,84	56,81	30,27	53	50
	1 26,0	44 48,5	14 44 52,2 W	44 40,1	28,80	57,51	30,15	51	49
	5 55,0	46 18,0	14 46 15,2 E	46 27,1					
	5 27,0	46 28,8	14 46 31,8 W	46 20,1	27,65	57,41	29,02	47	46
	18 ⁴ 9,4	45 46,1	14 45 48,9 W	45 36,9					
	3 12,6	46 53,0	14 46 49,7 E	47 1,0	27,09	56,99	29,10	45	44
	25 ⁰ 44,9	44 46,1	14 44 48,5 W	44 37,4					
6 36,6	48 50,7	14 48 49,3 E	49 3,4						
Nov.	1 ⁴ 40,3	46 2,7	14 46 5,0 W	45 52,7	26,31	56,67	29,27	44	42
	2 40,2	46 42,3	14 46 39,9 E	46 51,3	26,21	56,04	29,45	46	44
	2 ³ 42,8	45 32,7	14 45 35,8 W	45 24,2					
3 25,2	46 58,6	14 46 56,0 E	47 6,2						

TABLE I.—CONTINUED.

α Lyrae.

Date of observation	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope		Right hand Micr.	Sum of Equations	Mean Z. Dist. Jan. 1, 1819.		Bar.	Therm.	
			o	"			o	"		Int.	Ext.
1820 Dec.	24	51,3	46 17,4	14 46 18,5 W	46 6,1	+ 20,15	14 45 57,65	29,70	42	42	
	5	59,2	48 29,3	14 48 29,9 E	48 43,0						
	11	43,4	45 4,0	14 45 7,0 W	44 56,7	17,32	57,41	29,54	49	48	
	19	52,6	45 49,0	14 45 52,8 W	45 42,7	15,21	57,81	29,92	47	48	
	3	15,9	47 8,1	14 47 5,1 E	47 14,5						
	23	30,7	47 14,0	14 47 10,9 E	47 21,1	13,99	56,53	29,71	45½	45	
	2	12,8	45 11,8	14 45 16,5 W	45 6,5						
	28	10,4	47 32,9	14 47 31,2 E	47 41,4	12,80	57,72	29,69	35½	34	
3	13,6	45 36,0	14 45 39,2 W	45 28,4							
1821 Jan.	2	9,8	46 45,5	14 46 45,1 E	46 56,0	10,79	57,86	29,21	33	32½	
	6	15,7	47 26,0	14 47 27,2 W	47 14,7						
	13	34,9	46 23,8	14 46 26,0 W	46 14,8	7,27	57,70	29,41	41	40	
	2	26,6	46 54,2	14 46 52,3 E	47 1,7						
	19	39,6	46 29,5	14 46 31,1 W	46 18,8	5,72	57,14	30,04	44	42½	
	2	20,4	46 53,0	14 46 50,1 E	46 58,7						
	Feb.	1	37,9	47 52,0	14 47 49,4 E	48 0,5	2,20	55,79	29,96	43	40
		3	17,1	45 50,3	14 45 53,3 W	45 43,1					
	2	53,6	46 40,6	14 46 42,2 W	46 30,3	1,88	56,38	29,89	44	44	
	0	3,6	46 34,8	14 46 32,8 E	46 44,0						
	6	0,2	45 46,8	14 45 50,7 W	45 38,8	1,04	56,59	30,14	43	45	
	4	38,8	47 53,7	14 47 51,6 E	48 1,2						
	8	52,5	46 50,2	14 46 47,8 E	46 58,1	0,50	57,46	29,97	42½	41	
	3	29,5	46 0,0	14 46 2,8 W	45 52,0						
	10	51,7	47 28,7	14 47 29,5 E	47 39,7	+ 0,32	57,07	30,06	37	33	
	3	4,0	45 49,1	14 45 52,7 W	45 42,5						
	14	28,8	46 32,8	14 46 33,3 W	46 21,6	- 0,36	58,50	30,17	34½	32	
	1	14,2	46 43,7	14 46 42,1 E	46 2,1						
	19	37,7	46 33,7	14 46 35,7 W	46 23,8	1,26	55,66	30,07	31	30	
	3	20,3	47 16,7	14 47 15,5 E	47 26,6						
	24	15,1	47 45,2	14 47 43,8 E	47 54,2	2,34	58,02	29,76	34	30	
	1	52,4	45 32,6	14 45 34,2 W	45 24,5						
	27	2,6	46 52,5	14 46 53,8 W	46 41,8	3,17	56,28	29,00	33	50	
	3	26,1	47 20,1	14 47 19,2 E	47 30,0						
	March	9	41,5	46 10,8	14 46 14,8 W	46 3,1	4,62	56,96	29,05	44½	45
		1	14,5	47 46,3	14 47 42,3 E	47 52,5					
	10	4	34,0	46 36,5	14 46 38,3 W	46 27,3	4,41	56,67	29,43	41	38½
		3	50,5	47 33,5	14 47 31,8 E	47 42,3					

α Lyrae.

Date of observation.	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.	Right hand Micr.	Sum of Equations.	Mean Z. Dist. Jan. 1, 1819.	Bar.	Thermn.		
								Int.	Ext.	
1821	" "	" "	" "	" "	" "	" "				
March	11 2 46,2	47 8,1	14 47 6,5 E	47 17,4	— 4,39	14 45 56,45	29,56	41	38	
	4 28,8	46 32,6	14 46 34,3 W	46 24,7						
	12 2 0,9	45 33,2	14 45 36,6 W	45 25,0	4,50	56,13	29,60	43½	44	
	4 42,1	48 2,3	14 47 59,3 E	48 9,0						
	13 3 8,5	47 17,5	14 47 16,7 E	47 26,6	4,18	57,74	29,90	37	31	
	3 22,0	46 2,3	14 46 3,7 W	45 53,0						
	15 3 30,6	46 6,6	14 46 7,7 W	45 56,2	4,32	57,84	29,87	37½	34	
	2 51,4	47 11,5	14 47 10,4 E	47 21,1						
	19 2 7,4	45 43,7	14 45 40,0 W	45 28,5	4,80	57,80	29,21	35½	35	
	4 14,1	47 46,1	14 47 44,3 E	47 54,5						
21	4 17,6	47 48,2	14 47 46,6 E	47 58,1	4,55	58,06	29,61	34	31	
	1 47,4	45 34,5	14 45 36,1 W	45 25,0						
	22 1 2,4	45 26,4	14 45 28,5 W	45 16,5	— 4,44	56,93	29,75	33½	31	
July	5 28,6	48 28,0	14 48 26,0 E	48 37,1						
	6 4 48,3	46 19,4	14 46 23,7 W	46 12,6	+ 17,64	55,58	29,73	54	46	
	1 22,7	46 27,1	14 46 22,0 E	46 31,8						
10	5 50,9	48 22,8	14 48 19,6 E	48 31,2	18,87	55,51	29,98	57	51½	
	0 9,1	44 51,1	14 44 56,5 W	44 46,9						
	11 5 59,3	48 28,0	14 48 23,9 E	48 35,0	19,17	56,09	29,89	56½	49½	
	3 40,7	45 41,3	14 45 47,3 W	45 37,5						
	13 5 13,4	46 30,5	14 46 35,3 W	46 25,3	19,61	56,29	29,66	57	52	
	3 5,6	46 56,0	14 46 50,2 E	46 59,5						
	18 5 22,3	48 2,7	14 47 59,8 E	48 12,0	21,07	57,76	29,93	59	54	
	3 53,7	45 45,3	14 45 51,5 W	45 42,7						
20	5 16,2	46 29,7	14 46 33,9 W	46 22,3	21,33	55,38	29,35	59	56	
	1 16,8	46 24,5	14 46 19,8 E	46 30,6						
	23 4 29,7	46 1,2	14 46 5,7 W	45 55,0	22,12	55,30	29,25	58	53½	
	1 39,8	46 27,2	14 46 22,9 E	46 34,4						
	25 5 4,3	47 51,3	14 47 46,0 E	47 56,9	22,75	57,80	29,48	58	54	
	27 4 16,9	47 23,8	14 47 18,3 E	47 29,5	23,36	55,48	29,79	60	54	
	1 57,1	45 0,0	14 45 5,3 W	44 54,2						
	Aug.	1 3 40,9	47 6,9	14 46 59,8 E	47 9,8	24,53	55,81	29,76	63	57
		1 48,1	44 56,1	14 45 2,3 W	44 53,7					

TABLE I.—CONTINUED.

α Lyrae.

Date of observation.	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.		Right hand Micr.	Sum of Equations.	Mean. Z. Dist. Jan. 1, 1819.	Bar.	Therm.	
			o	l					Int.	Ext.
1821	" "	" "	" "	" "	" "	" "	" "			
Aug.	2 56,7	46 53,3	14 46	58,2W	46 48,1	+ 24,93	14 45 55,68	29,86	61	55
	2 29,8	46 37,3	14 46	31,8 E	46 43,2					
	4 2 10,1	46 32,0	14 46	25,9 E	46 35,2	25,16	55,10	29,70	65	60½
	4 41,9	46 3,2	14 46	10,0W	46 1,6					
	14 3 19,4	45 21,7	14 45	27,7W	45 17,9	27,44	55,08	29,61	61½	58
	3 52,6	47 5,8	14 47	0,9 E	47 12,6					
	16 3 19,8	46 51,9	14 46	46,7 E	46 57,9	27,95	56,16	29,77	60	57
	3 41,2	45 31,2	14 45	37,5W	45 29,8					
	23 2 5,2	46 24,1	14 46	18,0 E	46 28,2	29,11	54,46	29,73	64½	60
	5 12,8	46 18,1	14 46	25,6W	46 17,5					
	24 5 35,3	46 36,1	14 46	43,6W	46 34,4	29,14	57,17	29,67	67	62
	4 8,7	47 13,8	14 47	5,8 E	47 15,5					
Sept.	3 2 27,4	45 0,7	14 45	7,5W	44 58,2	30,57	55,46	29,50	66	63
	4 23,1	47 20,0	14 47	12,6 E	47 22,4					
	9 1 23,2	44 45,0	14 44	52,7W	44 42,9	31,30	55,44	29,24	59	56
	5 5,3	47 42,2	14 47	35,9 E	47 45,5					
	12 3 13,4	45 17,3	14 45	24,3W	45 11,4	31,82	55,98	29,57	58	54
	4 31,1	47 23,0	14 47	16,2 E	47 24,4					
	22 5 11,7	47 46,2	14 47	39,8 E	47 50,5	32,44	57,12	29,58	59	53½
	2 52,3	45 9,1	14 45	15,5W	45 6,3					
	26 4 43,8	46 1,3	14 46	6,3W	45 56,6	32,45	57,20	29,50	60	57
	2 25,2	46 30,4	14 46	24,6 E	46 33,2					
	27 2 40,3	46 33,9	14 46	27,9 E	46 38,2	32,61	56,04	29,62	57	52
	3 33,7	45 24,2	14 45	29,7W	45 20,2					
	28 2 44,0	46 34,0	14 46	29,3 E	46 38,5	32,28	55,75	28,92	57	54
	4 29,0	45 51,7	14 45	57,0W	45 47,2					
	29 2 56,0	45 11,7	14 45	15,2W	45 5,0	32,68	56,26	29,40	52	47½
	3 36,0	46 53,5	14 46	49,2 E	46 59,1					
Oct.	1 2 25,2	46 29,4	14 46	24,3 E	46 34,8	32,83	57,16	29,72	54	50½
	2 47,8	45 8,4	14 45	12,6W	45 3,8					
	8 2 4,7	44 57,4	14 45	1,1W	44 51,7	32,68	57,04	29,81	56	52
	4 53,3	47 33,7	14 47	28,5 E	47 37,5					
	14 1 19,4	44 47,0	14 44	51,5W	44 41,3	32,67	56,44	30,05	52	48
	4 11,6	47 10,5	14 47	5,5 E	47 15,0					
	23 5 11,5	47 46,3	14 47	40,8 E	47 50,6	31,42	57,57	28,92	51	49
	1 43,5	44 53,3	14 44	58,5W	44 49,5					

TABLE I.--CONTINUED.

α Lyrae.

Date of observation	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope.		Right hand Micr.	Sum of Equations.	Mean Z. Dist. Jan. 1, 1819.		Bar.	Therm.	
										Int.	Ext.
1821	' "	' "	o	' "	' "	"	o	' "			
Oct. 29	3 27,2	45 25,5	14 45	31,0 W	45 21,7	+ 30,96	14 45	56,30	29,82	56½	53
	3 1,8	46 40,2	14 46	36,0 E	46 44,9						
Nov. 27	4 22,8	45 57,5	14 46	2,0 W	45 52,0	25,69		56,11	29,34	42	39
	5 6,7	47 46,1	14 47	41,8 E	47 50,8						
	28 4 33,4	47 30,7	14 47	26,0 E	47 35,0	25,20		57,58	29,20	47	47½
	3 10,6	45 24,5	14 45	29,5 W	45 20,7						
	29 2 40,0	46 40,8	14 46	36,7 E	46 46,0	25,07		57,08	29,32	45½	44
	4 25,5	45 58,3	14 46	3,1 W	45 54,5						
Dec.	3 4 46,9	47 36,4	14 47	33,0 E	47 43,5	24,18		57,12	29,36	43	40½
	2 46,1	45 17,5	14 45	22,5 W	45 13,3						
	5 4 30,8	46 5,7	14 46	10,3 W	46 0,2	23,68		57,64	29,49	43	43½
	2 26,7	46 37,0	14 46	32,7 E	46 41,5						
	6 5 27,7	48 3,0	14 47	59,0 E	48 8,8	23,66		58,45	29,80	40½	42
	1 25,3	44 59,8	14 45	4,7 W	44 56,2						
	11 4 18,7	47 24,4	14 47	20,3 E	47 28,9	22,22		57,15	29,88	44½	42
	3 57,3	45 47,2	14 45	52,5 W	45 44,8						
	17 5 39,4	46 51,0	14 46	55,2 W	46 46,8	19,90		57,46	28,92	47	45
	3 45,6	47 10,0	14 47	5,5 E	47 13,3						
	21 4 31,0	47 35,0	14 47	30,2 E	47 38,4	18,76		57,99	28,88	44½	43½
	2 19,0	45 15,2	14 45	20,7 W	45 13,3						
	24 5 8,4	46 34,0	14 46	36,9 W	46 28,5	17,81		57,50	28,39	38½	38
	2 18,6	46 39,8	14 46	36,3 E	46 44,4						
	26 4 50,5	46 23,6	14 46	26,6 W	46 18,2	17,18		57,12	28,20	35½	34
	2 48,0	46 49,6	14 46	46,0 E	46 52,4						
	30 4 14,9	46 4,4	14 46	9,0 W	45 58,5	16,34		56,91	29,78	40½	39
	2 26,1	46 43,0	14 46	39,5 E	46 47,2						
	31 3 29,9	47 8,3	14 47	4,0 E	47 12,0	15,83		57,42	29,38	41	40
	3 45,6	45 48,9	14 45	54,3 W	45 46,0						
1822											
Jan. 1	4 39,4	47 42,5	14 47	38,5 E	47 46,6	15,70		58,63	29,53	38	37½
	3 11,1	45 36,9	14 45	41,7 W	45 34,0						
	4 2 16,8	45 21,4	14 45	24,5 W	45 15,6	15,11		57,50	29,92	34	35
	3 4,2	46 56,7	14 46	53,7 E	46 59,9						
	5 0 0,5	45 5,8	14 45	6,0 W	44 56,4	14,73		57,45	29,92	36½	37
	5 31,5	48 10,6	14 48	8,7 E	48 17,3						

TABLE I.—CONTINUED.

α Lyrae.

Date of observation	Time of ob. from passage over mer.	Left hand Micr.	Bottom Microscope	Right hand Micr.	Sum of Equations	Mean Z. Dist. Jan. 1, 1819.	Bar.	Therm.	
								Int.	Ext.
1822	" "	" "	" "	" "	" "	" "			
Jan.	6 1 44,6	46 35,0	14 46 32,5 E	46 42,3	+ 14,45	14 45 57,89	29,94	35½	37
	3 21,9	45 41,8	14 45 46,1 W	45 37,6					
	16 3 31,9	47 41,5	14 47 38,0 E	47 46,9	11,35	57,89	30,02	40½	39
	2 9,6	45 19,9	14 45 25,8 W	45 18,4					
	29 4 48,9	46 30,1	14 46 34,8 W	46 26,8	7,81	56,52	30,12	38½	35
	3 32,1	47 15,8	14 47 10,7 E	47 18,1					
	30 2 53,9	47 2,8	14 46 58,1 E	47 6,8	7,42	56,72	29,95	40	40
	3 26,1	45 47,6	14 45 53,0 W	45 45,0					
Feb.	5 2 15,0	46 52,5	14 46 48,5 E	46 56,8	5,82	57,68	29,58	38	39
	3 12,5	45 45,2	14 45 50,5 W	45 43,0					
	7 4 42,4	46 31,6	14 46 35,7 W	46 27,9	5,31	58,11	29,46	37	34
	3 15,1	47 11,5	14 47 7,1 E	47 15,3					
	11 5 32,4	47 4,2	14 47 7,5 W	46 56,6	4,65	57,88	29,85	37	38
	0 40,6	46 33,9	14 46 31,5 E	46 40,8					
	14 4 41,5	47 53,0	14 47 49,5 E	47 57,8	3,78	56,85	29,66	42	41
	2 46,5	45 38,3	14 45 43,7 W	45 35,9					
	15 6 16,8	47 35,5	14 47 37,8 W	47 28,0	3,93	56,63	30,01	37	35
	2 10,2	46 49,3	14 46 46,6 E	46 54,0					

TABLE II.

α Lyrae.

Date of observation.	Equations of condition.	Date of observation.	Equations of condition.
1818		1819	
July 14	$e + 23x + 85p + 82 z - 2,31 = 0$	Jan. 17	$e - 32x - 82p + 68 z + 0,57 = 0$
15	$e + 24x + 84p + 80 z - 1,77 = 0$	18	$e - 34x - 82p + 66 z - 0,66 = 0$
16	$e + 26x + 84p + 77 z - 1,67 = 0$	19	$e - 36x - 81p + 63 z + 1,17 = 0$
17	$e + 27x + 83p + 75 z - 4,15 = 0$	20	$e - 37x - 80p + 61 z - 0,27 = 0$
19	$e + 31x + 82p + 70 z - 3,09 = 0$	25	$e - 43x - 77p + 45 z - 0,52 = 0$
24	$e + 38x + 79p + 58 z - 0,94 = 0$	29	$e - 49x - 74p + 32 z + 0,90 = 0$
25	$e + 40x + 79p + 55 z - 3,69 = 0$	31	$e - 51x - 72p + 26 z - 0,20 = 0$
27	$e + 43x + 77p + 48 z - 2,65 = 0$	Feb. 1	$e - 52x - 71p + 22 z - 0,85 = 0$
Aug. 1	$e + 47x + 74p + 35 z - 0,06 = 0$	5	$e - 57x - 66p + 09 z + 0,33 = 0$
2	$e + 49x + 74p + 32 z - 1,38 = 0$	6	$e - 58x - 65p + 05 z + 0,66 = 0$
6	$e + 54x + 70p + 19 z - 2,73 = 0$	9	$e - 62x - 62p - 05 z + 0,60 = 0$
7	$e + 55x + 70p + 15 z + 0,44 = 0$	21	$e - 73x - 49p - 45 z - 0,10 = 0$
9	$e + 57x + 66p + 09 z - 0,27 = 0$	24	$e - 75x - 45p - 54 z + 1,00 = 0$
10	$e + 58x + 65p + 05 z - 1,34 = 0$	July 3	$e + 09x + 88p + 96 z - 4,41 = 0$
11	$e + 60x + 64p + 02 z - 1,20 = 0$	4	$e + 10x + 88p + 94 z - 1,14 = 0$
12	$e + 61x + 63p - 02 z - 0,47 = 0$	14	$e + 23x + 85p + 82 z - 2,66 = 0$
13	$e + 62x + 62p - 05 z - 1,60 = 0$	15	$e + 24x + 84p + 80 z - 1,19 = 0$
14	$e + 63x + 61p - 08 z - 0,77 = 0$	20	$e + 32x + 82p + 68 z - 1,28 = 0$
15	$e + 64x + 60p - 12 z - 1,46 = 0$	21	$e + 34x + 82p + 66 z - 0,82 = 0$
16	$e + 65x + 59p - 15 z - 1,13 = 0$	24	$e + 38x + 79p + 58 z - 1,15 = 0$
Oct. 16	$e + 84x - 25p - 77 z + 1,48 = 0$	28	$e + 43x + 77p + 45 z - 2,90 = 0$
17	$e + 84x - 26p - 75 z + 2,50 = 0$	29	$e + 44x + 76p + 42 z - 1,66 = 0$
19	$e + 82x - 29p - 70 z - 0,18 = 0$	30	$e + 46x + 75p + 39 z - 2,54 = 0$
20	$e + 82x - 31p - 68 z - 0,36 = 0$	Aug. 2	$e + 49x + 74p + 32 z - 1,88 = 0$
26	$e + 79x - 41p - 52 z + 1,71 = 0$	4	$e + 51x + 72p + 26 z - 1,89 = 0$
Nov. 2	$e + 74x - 49p - 32 z + 0,82 = 0$	7	$e + 55x + 70p + 15 z - 2,34 = 0$
3	$e + 73x - 50p - 29 z - 0,63 = 0$	9	$e + 57x + 66p + 09 z - 0,88 = 0$
7	$e + 69x - 55p - 15 z - 0,02 = 0$	15	$e + 64x + 60p - 12 z - 3,90 = 0$
8	$e + 67x - 56p - 12 z + 0,41 = 0$	18	$e + 67x + 57p - 22 z - 0,46 = 0$
24	$e + 48x - 73p + 45 z + 1,71 = 0$	19	$e + 67x + 55p - 25 z - 0,68 = 0$
Dec. 5	$e + 34x - 81p + 74 z - 0,45 = 0$	21	$e + 69x + 53p - 32 z - 1,36 = 0$
7	$e + 31x - 82p + 78 z + 1,24 = 0$	23	$e + 71x + 51p - 39 z - 1,19 = 0$
9	$e + 28x - 82p + 83 z + 0,50 = 0$	27	$e + 75x + 46p - 49 z - 3,15 = 0$
15	$e + 19x - 86p + 92 z - 1,92 = 0$	31	$e + 78x + 41p - 62 z + 1,01 = 0$
16	$e + 18x - 86p + 93 z + 0,83 = 0$	Sept. 8	$e + 82x + 31p - 78 z + 1,38 = 0$
Dec. 21	$e + 10x - 88p + 98 z - 2,90 = 0$	10	$e + 84x + 28p - 83 z + 1,23 = 0$
22	$e + 08x - 88p + 99 z - 0,87 = 0$	12	$e + 85x + 24p - 87 z - 0,97 = 0$
1819 Jan. 8	$e - 19x - 85p + 87 z + 1,79 = 0$	14	$e + 85x + 21p - 90 z - 2,85 = 0$
10	$e - 22x - 85p + 84 z - 1,01 = 0$	16	$e + 86x + 19p - 92 z - 0,28 = 0$
11	$e - 23x - 84p + 82 z - 0,84 = 0$	20	$e + 88x + 13p - 96 z + 0,95 = 0$
12	$e - 25x - 84p + 80 z - 0,30 = 0$	21	$e + 87x + 13p - 97 z - 0,85 = 0$

α Lyræ.

Date of observation.	Equations of condition.	Date of observation.	Equations of condition.
1819		1820	
Sept. 22	1 $e + 88x + 10p - 98z - 0,87 = 0$	July 19	2 $e + 31x + 82p + 70z + 0,33 = 0$
23	1 $e + 88x + 08p - 99z - 0,70 = 0$	24	2 $e + 38x + 79p + 58z - 0,51 = 0$
Oct. 2	2 $e + 88x - 05p - 97z - 0,10 = 0$	25	2 $e + 40x + 79p + 55z - 0,57 = 0$
4	2 $e + 88x - 09p - 96z + 1,03 = 0$	Sept. 12	2 $e + 85x + 24p - 87z + 0,90 = 0$
17	1 $e + 84x - 26p - 75z + 2,24 = 0$	15	2 $e + 86x + 20p - 91z + 0,19 = 0$
20	2 $e + 81x - 33p - 68z + 0,83 = 0$	18	2 $e + 86x + 16p - 94z + 0,56 = 0$
29	1 $e + 76x - 45p - 42z + 2,27 = 0$	20	2 $e + 87x + 13p - 96z + 0,08 = 0$
30	1 $e + 75x - 46p - 39z + 0,79 = 0$	Oct. 4	2 $e + 88x - 08p - 96z + 0,86 = 0$
Nov. 2	1 $e + 74x - 49p - 32z + 1,79 = 0$	5	2 $e + 87x - 10p - 94z + 1,56 = 0$
8	1 $e + 69x - 56p - 12z - 0,28 = 0$	18	2 $e + 83x - 28p - 73z + 1,35 = 0$
Dec. 13	2 $e + 22x - 85p + 90z - 0,10 = 0$	25	2 $e + 79x - 39p - 55z + 0,84 = 0$
15 & 23	2 $e + 13x - 87p + 96z + 0,10 = 0$	Nov. 1	2 $e + 74x - 48p - 35z + 0,43 = 0$
16	3 $e + 17x - 86p + 93z - 0,70 = 0$	2	2 $e + 74x - 49p - 32z - 0,22 = 0$
26	4 $e + 02x - 88p + 98z + 1,45 = 0$	Dec. 2	2 $e + 38x - 80p + 68z + 0,92 = 0$
29	2 $e - 03x - 88p + 98z + 1,57 = 0$	11	1 $e + 24x - 85p + 87z + 0,59 = 0$
30	2 $e - 04x - 88p + 97z + 1,76 = 0$	19	2 $e + 13x - 87p + 96z + 0,95 = 0$
1820 Jan. 2	2 $e - 09x - 88p + 96z + 1,46 = 0$	23	2 $e + 06x - 88p + 99z - 0,35 = 0$
5	2 $e - 13x - 86p + 92z + 0,90 = 0$	28	2 $e - 03x - 88p + 98z + 0,84 = 0$
15	2 $e - 29x - 82p + 73z + 1,48 = 0$	1821 Jan. 2	2 $e - 10x - 88p + 96z + 0,98 = 0$
16	2 $e - 31x - 82p + 70z + 1,12 = 0$	13	2 $e - 28x - 83p + 77z + 0,92 = 0$
March 2	2 $e - 80x - 37p - 70z + 1,08 = 0$	19	2 $e - 37x - 80p + 63z + 0,43 = 0$
8	2 $e - 83x - 28p - 83z + 0,87 = 0$	Feb. 1	2 $e - 54x - 70p + 22z - 0,73 = 0$
19	2 $e - 88x - 11p - 97z - 0,21 = 0$	2	2 $e - 55x - 69p + 19z - 0,12 = 0$
22	2 $e - 88x - 07p - 99z + 0,16 = 0$	6	2 $e - 60x - 64p + 05z + 0,15 = 0$
24	2 $e - 88x - 04p - 98z + 0,41 = 0$	8	2 $e - 62x - 62p - 02z + 1,05 = 0$
25	2 $e - 88x - 02p - 98z + 1,36 = 0$	10	2 $e - 64x - 60p - 08z + 0,70 = 0$
April 5	2 $e - 86x + 14p - 90z - 0,35 = 0$	14	2 $e - 68x - 56p - 22z + 2,19 = 0$
6	2 $e - 86x + 15p - 89z - 0,47 = 0$	19	2 $e - 72x - 50p - 39z - 0,57 = 0$
July 5	2 $e + 12x + 87p + 93z + 0,19 = 0$	24	2 $e - 76x - 42p - 53z + 1,86 = 0$
7	2 $e + 14x + 87p + 90z - 1,27 = 0$	27	2 $e - 79x - 40p - 62z + 0,16 = 0$
8	2 $e + 16x + 87p + 89z - 1,14 = 0$	March 9	2 $e - 85x - 24p - 85z + 0,95 = 0$
10	2 $e + 19x + 86p + 87z - 0,75 = 0$	10	2 $e - 85x - 23p - 87z + 0,67 = 0$
13	2 $e + 22x + 85p + 84z - 1,02 = 0$	11	2 $e - 85x - 21p - 89z + 0,46 = 0$
15	2 $e + 24x + 84p + 80z - 1,99 = 0$	12	2 $e - 85x - 20p - 90z + 0,15 = 0$
18	2 $e + 29x + 82p + 73z + 0,11 = 0$	13	2 $e - 86x - 19p - 91z + 1,76 = 0$

α Lyrae.

Date of observation.	Equations of condition.	Date of observation.	Equations of condition.
1821		1821	
March 15	$2e - 87x - 15p - 93z + 1,87 = 0$	Oct. 14	$2e + 85x - 22p - 82z + 0,43 = 0$
19	$2e - 88x - 09p - 97z + 1,85 = 0$	23	$2e + 80x - 37p - 61z + 1,45 = 0$
21	$2e - 88x - 06p - 99z + 2,12 = 0$	29	$2e + 76x - 44p - 43z + 0,10 = 0$
22	$2e - 88x - 05p - 99z + 0,99 = 0$	Nov. 27	$2e + 45x - 75p + 53z - 0,55 = 0$
July 6	$2e + 12x + 87p + 92z - 1,28 = 0$	28	$2e + 43x - 76p + 56z + 0,91 = 0$
10	$2e + 18x + 86p + 88z - 1,33 = 0$	29	$2e + 42x - 77p + 59z + 0,39 = 0$
11	$2e + 19x + 86p + 86z - 0,74 = 0$	Dec. 3	$2e + 37x - 80p + 70z + 0,38 = 0$
13	$2e + 22x + 85p + 84z - 0,53 = 0$	5	$2e + 34x - 82p + 74z + 0,88 = 0$
18	$2e + 29x + 83p + 73z + 1,00 = 0$	6	$2e + 32x - 82p + 76z + 1,68 = 0$
20	$2e + 32x + 82p + 68z - 1,36 = 0$	11	$2e + 24x - 85p + 87z + 0,33 = 0$
23	$2e + 37x + 80p + 61z - 1,40 = 0$	17	$2e + 16x - 86p + 94z + 0,61 = 0$
25	$2e + 39x + 79p + 55z + 1,13 = 0$	21	$2e + 09x - 88p + 98z + 1,11 = 0$
27	$2e + 42x + 77p + 48z - 1,16 = 0$	24	$2e + 05x - 88p + 99z + 0,62 = 0$
Aug. 1	$2e + 48x + 74p + 35z - 0,77 = 0$	26	$2e + 02x - 88p + 98z + 0,24 = 0$
2	$2e + 49x + 74p + 32z - 0,88 = 0$	30	$2e - 04x - 88p + 97z + 0,03 = 0$
4	$2e + 51x + 72p + 26z - 1,43 = 0$	31	$2e - 06x - 88p + 97z + 0,54 = 0$
14	$1e + 63x + 61p - 08z - 1,30 = 0$	1822 Jan. 1	$2e - 07x - 88p + 97z + 1,76 = 0$
16	$2e + 65x + 59p - 15z - 0,18 = 0$	4	$2e - 11x - 87p + 93z + 0,64 = 0$
23	$2e + 71x + 51p - 39z - 1,77 = 0$	5	$2e - 13x - 87p + 92z + 0,59 = 0$
24	$2e + 72x + 50p - 42z + 0,95 = 0$	6	$2e - 16x - 87p + 90z + 1,04 = 0$
Sept. 3	$2e + 80x + 38p - 68z - 0,63 = 0$	16	$2e - 31x - 82p + 70z + 1,14 = 0$
9	$2e + 83x + 29p - 81z - 0,59 = 0$	29	$2e - 49x - 74p + 32z - 0,04 = 0$
12	$2e + 85x + 24p - 87z - 0,02 = 0$	30	$2e - 50x - 73p + 29z + 0,17 = 0$
22	$2e + 88x + 09p - 98z + 1,18 = 0$	Feb. 5	$2e - 57x - 66p + 09z + 1,23 = 0$
26	$2e + 88x + 04p - 98z + 1,26 = 0$	7	$2e - 60x - 64p + 02z + 1,69 = 0$
27	$2e + 88x + 02p - 98z + 0,10 = 0$	11	$2e - 64x - 60p - 12z + 1,52 = 0$
28	$2e + 88x + 01p - 98z - 0,19 = 0$	14	$2e - 66x - 57p - 22z + 0,54 = 0$
29	$2e + 88x - 01p - 98z + 0,32 = 0$	15	$2e - 67x - 55p - 25z + 0,34 = 0$
Oct. 1	$2e + 88x - 04p - 97z + 1,22 = 0$		
8	$2e + 87x - 14p - 90z + 1,07 = 0$		

TABLE III.

α Lyrae.

	⊙ Long. s . o	Solar Nutation. Contrary sign.	Sum of 3 Equations Pr. ab. and s. n.	Coeff. of x.	Coeff. of p.	Coeff. of z.
January	1 9 . 10	-0,47	-0,95	—,07	—,88	+,97
	10 20	-0,41	-4,01 _{3,06}	—,22	—,85	+,84
	20 10 . 0	-0,29	-6,99 _{2,98}	—,37	—,80	+,61
	30 10	-0,14	-9,77 _{2,78}	—,50	—,73	+,29
February	9 20	+0,02	-12,25	—,62	—,62	—,05
	19 11 . 0	+0,18	-14,34 _{2,09}	—,72	—,51	—,39
March	1 10	+0,32	-15,97	—,80	—,38	—,68
	11 20	+0,42	-17,08 _{1,11}	—,85	—,23	—,89
	21 0 . 0	+0,47	-17,62 _{0,54}	—,88	—,08	—,99
	31 10	+0,47	-17,56 _{0,06}	—,88	+,07	—,97
April	10 20	+0,41	-16,90	—,85	+,22	—,84
	20 1 . 0	+0,29	-15,66 _{1,24}	—,80	+,37	—,61
May	1 10	+0,14	-13,88	—,73	+,50	—,29
	11 20	-0,02	-11,66 _{2,22}	—,63	+,62	+,05
	21 2 . 0	-0,18	-9,03 _{2,63}	—,51	+,72	+,39
June	1 10	-0,32	-6,12	—,38	+,80	+,68
	11 20	-0,42	-3,02 _{3,10}	—,23	+,85	+,89
	22 3 . 0	-0,47	+0,19 _{3,51}	—,08	+,88	+,99
July	2 10	-0,47	+3,39	+,07	+,88	+,97
	13 20	-0,41	+6,49 _{3,10}	+,22	+,85	+,84
	23 4 . 0	-0,29	+9,39 _{2,50}	+,37	+,80	+,61

α Lyrae.

	☉ Long. s . o	Solar Nutation. Contrary sign.	Sum of 3 Equations Pr. ab. and s. n.	Coeff. of x.	Coeff. of p.	Coeff. of z.
August	3 4 . 10	-0,14	+12,04	+ ,50	+ ,73	+ ,29
	13 20	+0,02	+14,37 ^{2,33}	+ ,62	+ ,62	- ,05
	23 5 . 0	+0,18	+16,31 ^{1,94} _{1,52}	+ ,72	+ ,51	- ,39
September	3 10	+0,32	+17,83	+ ,80	+ ,38	- ,68
	13 20	+0,42	+18,90 ^{1,07}	+ ,85	+ ,23	- ,89
	23 6 . 0	+0,47	+19,51 ^{0,61} _{0,10}	+ ,88	+ ,08	- ,99
October	3 10	+0,47	+19,61	+ ,88	- ,07	- ,97
	13 20	+0,41	+19,23 ^{0,38}	+ ,85	- ,22	- ,84
	23 7 . 0	+0,29	+18,39 ^{0,84} _{1,30}	+ ,80	- ,37	- ,61
November	3 10	+0,14	+17,09	+ ,73	- ,50	- ,29
	13 20	-0,02	+15,35 ^{1,74}	+ ,62	- ,62	+ ,05
	22 8 . 0	-0,18	+13,21 ^{2,14} _{2,46}	+ ,51	- ,72	+ ,39
December	2 10	-0,32	+10,75	+ ,38	- ,80	+ ,68
	12 20	-0,42	+ 8,01 ^{2,74}	+ ,23	- ,85	+ ,89
	22 9 . 0	-0,47	+ 5,07 ^{2,94}	+ ,08	- ,88	+ ,99
January	1 10	-0,47	+ 2,05 ^{3,62}	- ,07	- ,88	+ ,97

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ERRATUM.—Page 9, insert the sign — before 8",28



*On the Application of the Science of Geology to the purposes of
Practical Navigation. By Alexander Nimmo, Civil Engineer,
M. R. I. A. &c.*

Read October 27, 1823.

IT is an old and perhaps a trite observation, that all the various branches of science are calculated to throw light upon each other; and hence, that an extended acquaintance with the several departments of natural knowledge is the surest way to attain to eminence in the pursuit of any one. In a society like this, composed of persons of different pursuits, and whose ideas are directed to a variety of objects, it is perhaps one of the greatest advantages, that, in any new enquiry, we may be enabled to draw from stores of information that are beyond the reach of any individual mind.

Geology, it has been said, is one of the youngest of the sciences; and, though much has been done, of late years, to place it on that sure footing of observation and induction, without which, we know, there can be no real progress in natural knowledge, it is yet not entirely freed from those hypothetical notions, of which the works of its earliest writers entirely consist.

The *modus operandi*, by which the existing strata of the earth were first produced, or at least arranged in their present order, is still the favorite speculation among writers on Geology; and, from the great question, whether the immediate agent has been water or caloric, by the presence or removal of which the particles of minerals have been arranged in their present form, there have arisen two

great sects or schools of Geologists, by the active zeal of whose disciples most of our present knowledge has been obtained.

I have often regretted, that the partisans of these several doctrines, in their ardour to jump to a conclusion in favour of their peculiar principle, have frequently overlooked the assistance which their investigations might have derived from the other departments of Science. They have often ascribed effects to chemical agency, which the present state of our knowledge in that science does not warrant us to assume; and others to the mechanical operation of water, which the laws of hydraulics enable us positively to pronounce impossible. And, on the other hand, there seem to be effects producible from each of these causes, as well as from the atmospheric or meteoric phenomena and the actions of living beings, which are in general entirely overlooked.

Geology however, so far as it is founded on observation, is still a science; and, in the delineation and description of the strata of the land, it is daily extending its bounds and its utility.

I am now about to introduce an application of it to the notice of the Academy, which seems never yet to have attracted the attention of those most interested in the pursuit; but from which I confidently hope, when observations are multiplied, that much public advantage may hereafter be obtained.

I have been some time engaged in a survey of the coasts, harbours, and fishing grounds, round this kingdom, with a view to the improvement and extension of the Irish fisheries. In this investigation, it has become necessary to take numerous soundings of the neighbouring sea, as well to discover the habitat of the different kinds of fish, as to direct the seamen to avoid dangers in navigating our shores. This has led me to consider the subject of soundings generally: one which, to the best of my knowledge, has never yet

been reduced to any kind of scientific principles ; but is left entirely in the hands of the experienced though uneducated seaman. In these hands it is however of great importance ; as, in shallow seas and on coasting voyages, it supersedes entirely the scientific part of navigation.

Two particulars are ascertained by the use of the sounding lead : the depth of water and nature of the bottom. It is to the latter only I shall call the attention of the Society.

It is the opinion of many Geologists, that the bottom of the sea, being the receptacle of all the disintegrated particles of the land, must be an immense bed of alluvion, the parts of which, from the motion caused by tides or currents, must tend constantly towards the deeper portions of the ocean.

It is evident, that the finer and lighter particles, which expose a greater surface in proportion to their gravity, are likely to be carried farthest ; so that near the shore we may expect to find gravels or shingle ; farther out sand ; beyond that mud ; and finally ooze or vegetable remains. In the same manner as in the beds of rivers, in the upper country, where the descent and consequently the velocity is rapid, we have rocks and boulders ; succeeded as we approach the plains by gravel, sand ; then clay or mud ; and, lastly, as the waters become sluggish and stagnant, by weeds and mosses.

There can be no doubt, but, in heavy inshore winds, the waters which are propelled by the friction of the air on their surface towards the shore, must run off again by a subaqueous current known to seamen by the name of the "undertow," and that this is the chief cause of the abrasion of the shores. The velocity of this current will naturally diminish as it gets into deeper water ; but may be very considerable even at great depths, as the following instance will show.

In the year 1804, I made some experiments on Lough Ness in the north of Scotland, in company with my friend Simon Frazer, Esq. of Foyers ; to discover the temperature of the water at the bottom of that lake, and whether it had any impregnation of salt agreeable to the theory of Count Rumford. After dropping a vessel of half a gallon several times to the depth of 120 fathoms, we found the boat had gradually drifted a mile up the lake, though the day was rather calm, and what little wind there was was blowing downward. We could only account for this, by suposing a subaqueous eddy to be produced by the waters of the surface being blown towards the lower end and returning by the bottom.

Accordingly, on an examination of the bottom of the sea along the north eastern shores of Ireland, I found this order of arrangement to be nearly what occurs.

From Howth, within Lambay and Rockabill, we have patches of rough ground, stones, shingles, and clay, to the Skerries Isles ; another patch of this kind is found north of Clogher head ; one north of Dunany extending to Cooley point, the Helly hunter rock off the coast of Mourne, &c. Outside of these, we have a zone of clean ground and sandy bottom from the Wicklow banks by Howth head, outside of Lambay to St. John's point, and thence to the Copeland. Such ground is fit for trawling on, and therefore its limits are well ascertained.

Beyond the sand, we have mud and ooze in the deep water until we approach the shores of the Isle of Man, where the sand and then rough ground again returns. The mud ground cannot be fished by the trawl : it is the resort of the cod and ling, which are taken by the hook and line, so that its extent is pretty well known to the fishermen. This mud ground however does not occupy the deep water generally ; but is confined to particular places.

On the hypothesis that the bottom of the sea is a great bed of al-

lution, produced by the action of currents on its own surface or on the neighbouring land, we may readily explain the existence of these mud grounds in the Irish sea by the motion of the tides; for the finer matter will be naturally deposited in those places where there is comparatively still water.

The north and south tides on the east coast of Ireland meet off St. John's point, and the current is slackened for a considerable space ere it reach that. Hence we have little or no current of tide between Lambay and the Isle of Man; and this is precisely the position of the great bed of mud.

In like manner another extent of mud ground occurs in the wake, as seamen call it, of the Isle of Man, between that isle and the coast of Lancashire and Cumberland; for the streams, setting up St. George's channel and in by the north channel, meet and regurgitate on this coast, producing high tides and still water, and a consequent deposition in the offing. This mud ground extends from off the mouth of the Ribble northward, and to the mid-channel between St. Bee's head in Cumberland and the Isle of Man.

A third but smaller portion lies in Carnarvon Bay, in the wake of Brachypult point, where also there is little stream of tide.

Another in the mouth of Clyde in the wake of Cantire, and many smaller in sheltered places.

As it is evident therefore, that these are alluvial depositions, it does not seem too much to admit, that the adjacent portions or zones of sand are in all probability the rougher particles of the strata, not admitting of being transported so far, or whose finer particles are swept off into the still water.

It would appear, that the current of tide which sweeps these particles before it, so far from carrying them out into the deep water of the ocean, tends rather to regorge them against the shores: the tidal water, after the reflection from the coast, naturally returning

by the surface, occasions less action against the bottom during the ebb. But, as we pass off towards the ocean, we are presented with phenomena of a different kind.

To the south of the bay of Dublin, along our shores, are the remarkable banks called the Irish grounds. They have never yet been sufficiently explored; and I was called off to the west of Ireland last year, when about to begin that survey. I am however strongly inclined to think these banks will be found, not merely accumulations of sand, but to be in fact owing to the existence of ridges of rock or other solid matter in that situation; the more especially as the rough bottom extends from thence all the way over to Carnarvonshire.

To the southward of the parallel of Wicklow, and outside of the banks, there is, in the middle of the channel, a remarkable deposition of shells. It extends at least as far as the parallel of Tuskar, where it is again succeeded by sand, which composes most part of the flat called the Nymph bank.

This extensive shelly bed necessarily implies a peculiar supply of calcareous matter; and it is particularly remarkable, that the country on either side cannot have produced it. There are no rivers of any consequence; and the shores, on either side, are composed entirely of slate and granite. Here then is a substance composing the bottom of the sea, to a great extent, which is evidently not the result of alluvion.

A similar extensive shelly bed occupies the centre of the wide part of the sea between Lancashire, Wales, and the Isle of Man. That portion of the sea however has limestone shores in Furness, Lancashire, Denbighshire, and Anglesea; and therefore the existence of calcareous matter, in the bottom of the sea, may not be so remarkable.

Most Geologists are agreed, that the abundance of organic remains in the limestone rocks show them to have been, at some former period, the residence of animals. Nay some have gone so far as to suppose, that these rocks are entirely composed of the remains of the animals of a former race, consolidated together by the effect of subsequent revolutions of the globe. In either way, the position of the great shell beds before mentioned bears a singular analogy to the situation of the limestone strata, which covers so large an extent of Ireland; and it might perhaps be possible to discover, by a careful examination of the shelly remains, whether they are portions of the petrifications from a limestone rock abraded by the action of the sea, or the *exuviae* of animals now in existence. In the mean time, it is proper to observe, that no other so remarkable a bed of shelly matter occurs elsewhere in the Irish sea, or until you get beyond the northern straits into the Atlantic; nor do I know of any so remarkable in the north sea, though the nature of its bottom appears to have been carefully investigated by pilots.

In the British channel however, there is another extensive tract of this nature occupying the centre of the space between England and France, and for many miles to the westward while you keep south of Scilly; but, to the north of Scilly, the bottom is of an entirely different nature.

Nothing is more interesting to Navigators, on their way home from the Atlantic to our coasts, than the means of distinctly ascertaining their position on approaching the land. In thick weather, when astronomical observations are not to be had, and when, from the influence of unknown currents or the like, the reckoning may be justly suspected, it is of the utmost consequence to keep the ship in the fair way of the channel.

Experienced pilots allege, that this may be known by the nature

of the soundings, and have formed tables of these for the use of navigators; but their modes of description are so vague, that it is difficult to reconcile them, and hence an opinion has arisen among many, that this kind of knowledge is not to be depended on.

The portion of the ocean adjacent to the mouth of the channel, being so much traversed by the maritime nations, has been rather minutely explored; and the bank of soundings, or that space wherein the sea is less than 100 fathoms in depth, and which is nearly confined within a line drawn from Bourdeaux to the west of Ireland, has been delineated both by French and English Hydrographers.

This line, or the edge of the bank, is about 200 miles to the west of the Land's end of Cornwall; for the last 150 miles, the ground is almost flat; but, beyond that line, the inclination of the bottom rapidly changes, and the depth suddenly increases to 200 fathoms and upwards. Round the bottom of the bay of Biscay, this depth is found within a few miles of the shore.

On so extensive and level a plain, it would be unreasonable to expect the bottom to be entirely composed of alluvion from distant lands. The action of the ebbing and flowing tide must nearly be the same each way; and, although it may have the effect of grinding or wearing down the upper surface of the strata into small fragments or fine sand, yet it cannot transport them far from the place where they are produced.

In fact, we find that the pilots, although their notes are inserted only in detached places, ascribe a uniformity of character to considerable portions of the bottom; showing distinctly, that, *like the soils on the dry land, this character must derive its origin from the nature of the subjacent rock, by the disintegration of which these soils are formed.*

Unfortunately the pilot has never yet been taught to consider the chemical or mineralogical character of the substances, which he brings from the bottom of the sea, so that it is not easy to conjecture what is meant by the descriptions he gives; but, with the last idea in view, I think much light may be thrown on the subject, and hereafter we may hope for more distinct information and a better nomenclature.

If what I am now about to state be confirmed by future observation, the position of the Navigator a hundred miles at sea may be as certainly ascertained by sounding as if he was within sight of land.

It is agreed on all hands, that, if there be any thing tolerably certain in Geological science, it is, that the component rocks of the globe follow a certain order of position with respect to each other: that, for example, the chrystallized granitic rocks are the lowest, followed by the slaty, whether micaceous or argillaceous; that these are covered by the conglomerate sandstone beds, this again by the limestone, that by sandstone and coal, and the coal measures are again covered by other horizontal strata of various kinds, viz. red marl, oolites, chalk, &c. of which, though they constitute the chief strata in the east of England and in France, we have few examples in this country, and therefore they need not be here particularized.

Now observe, that the strata of the west of France and England are primary, viz. granite and slate; those of Wales and the south of Ireland, slate, conglomerate, and coal; and that, for a great way up the channel, we need expect to find nothing higher in the series of strata.

When we look at the western edge of the bank of soundings, we find it described as fine white sand, *i. e.* quartz; white sand with black specks, *i. e.* quartz with mica; and, along the south edge,

gray or granite sand, extending all the way into the shores of Brittany, which are also granite.

The *Sole-bank*, which lies about five leagues within the edge of the soundings, about as large as Cornwall, and 180 feet over the general level is mostly fine white sand and black specks, evidently a fine grained granite country. To the east of this, a large tract lies on the south side of the fair way distinguished by coarse red sand, stones, and gravel. This is just what we might expect from the disintegration of the red conglomerate sandstone, which covers the primary rocks, and is succeeded by the limestone; and accordingly, immediately when we pass this red stony tract, we enter on the great shell bed, which, although not noticed particularly to the westward of the red tract, continues all the way up the middle of the channel, until we fall in with the chalk country of the south of England.

The shelly tract spreads away to either side of the red sandstone, westward, in two narrow streaks; and, by keeping within the northernmost of these, we avoid falling into the Irish channel. And, to the north of this, is a tract of gray sand with black specks, which may be traced all the way from the Solebank aforesaid into the isles of Scilly; shewing evidently its connection with the granites and mica slate of those isles and Cornwall.

To the south of this, between the shell bed and the Scilly islands, is an extensive tract of brown sand. I can only suppose a disintegrated graywacké, or brown slate rock, or killas, as it would be named in Cornwall; especially as the same character obtains to the south of the western part of Ireland, where it seems an extension of the brown slate country of Cork and Kerry.

When, so far in as the line from Cork to Ushant, we have about sixty fathoms water, the line however which marks that depth in-

dents into the two channels, and passes a good way to the west of Scilly. The decision as to which channel we are in should therefore be made before we are in that depth ; as, if we have got too far to the northward, and are making to the English channel, we will find the current described by Major Rennel, and the prevalent southerly winds, greatly to obstruct our progress.

Sixty miles west of Scilly, is Jones's bank forty fathoms and ooze. This is the highest portion of a great ooze bed, which particularly distinguishes the St. George's channel. It extends from the meridian of Scilly westward to near the edge of the bank of Soundings. This soft ground does not stick to the bottom of the lead when armed with tallow ; butter is therefore used for that purpose. As we have traced the other soundings to similar rocks on the shores, so this great ooze bed, if an original formation, may perhaps be considered as a continuation of that great field of coal, which, beginning at Newcastle, passes through England to Bristol and South Wales. I think I have I found the same deposition in other similar situations.

Nearer the Irish shore, we have again the graywacké, or brown slate sand, occupying all the bottom to the coast of Munster, as might be expected. That coast, from Waterford to the Blaskets, is one uninterrupted tract of brown slate. The Nymph bank is chiefly conglomerate, and from thence towards the Bristol channel I have no positive information of the nature of the soundings.

It appears to be therefore possible, on rational principles, to delineate masses of the different soils of the bottom of the sea, as has been done for those of the land ; and, by instructing the pilot more carefully to ascertain the distinctions between the various kinds of sand or other matter which he may bring up from the bottom, so as more readily to refer to the corresponding part of his chart, it is

evident, that a great additional precision will be afforded to this mode of discovering his place, when astronomical observations are not to be had and his reckoning is doubtful.

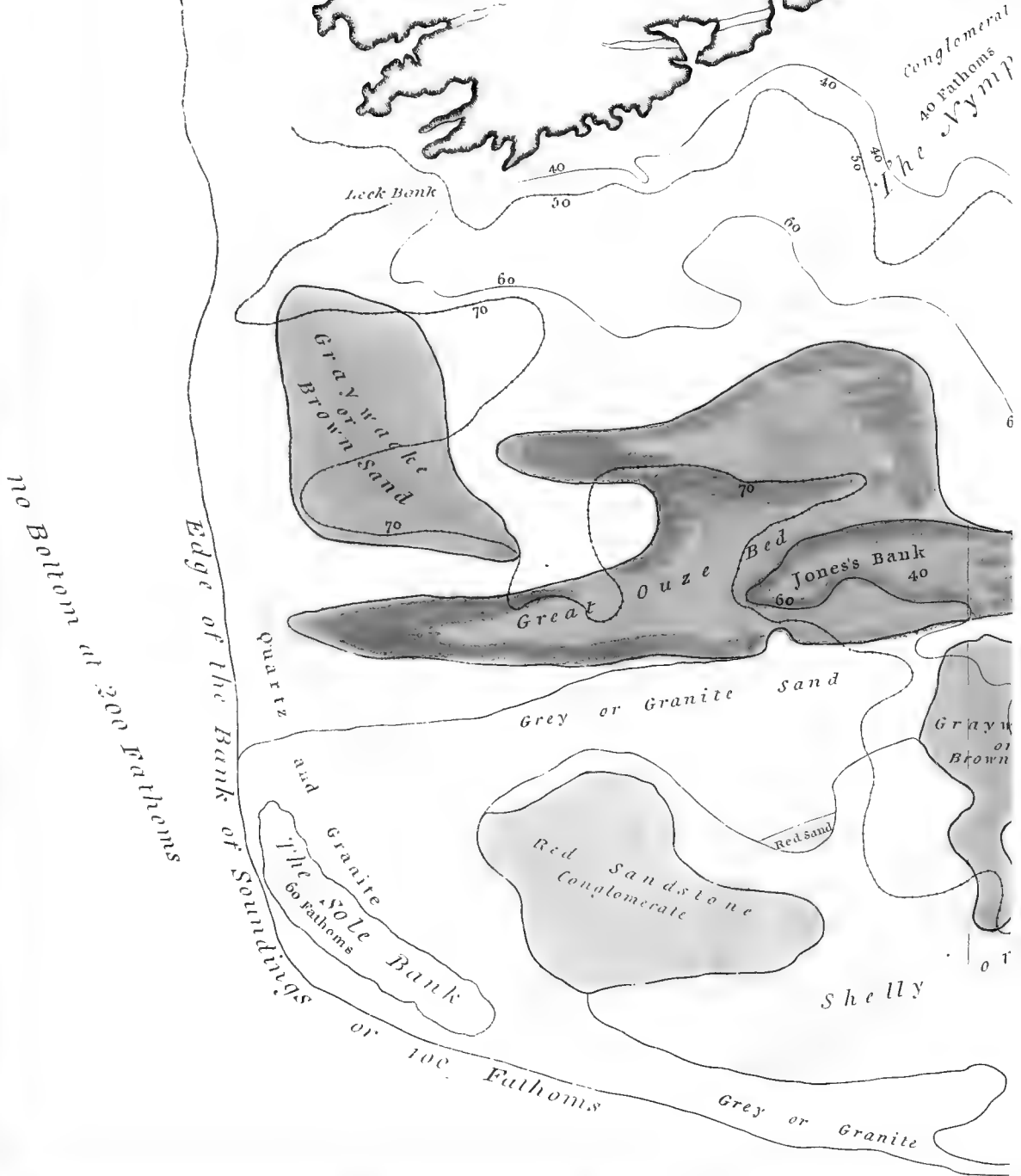
I have annexed to this paper a reduced chart of the bank of Soundings, on which the various descriptions of bottom above noticed are distinguished by colours, as far as they can be ascertained from our present charts; and also a series of lines of equal sounding, at every ten fathoms in succession, from fifty to one hundred fathoms.

In this way, a species of meshwork subdivision of the bank is effected, similar to what we obtain by the lines of latitude and longitude, or those of equal variation of the compass.

The chart is necessarily very imperfect, but it illustrates what I have in view; and, from the well known zeal and talent of our navigators, we may look forward confidently to its future improvement.

I have pursued the same idea over charts of other portions of the ocean, which I may make the subject of a future communication.

IRELAND





GEOLOGY,
or a General Outline
for the purposes of
NAVIGATION.

An Account of a Trigonometrical Survey of Mayo, one of the Maritime Counties of Ireland. By William Bald, Civil Engineer, Member of the Geological Society, London, and M. R. I. A.

Read April 30th, 1821.

IN the year 1809 I was employed by the Grand Jury of Mayo to make a map and survey of their county, which was to be drawn and laid down from a scale of three inches to the Irish mile. The whole of the summer of 1809 was occupied in constructing a geometrical map of the environs of Castlebar, and in obtaining a knowledge of the face of the country, with a view to the planning of the triangles, and the measurement of a base as the foundation of the general geometrical survey and map. After a diligent search, no plain could be found that would admit of a base of more than two miles in length, except by going through bog. One of these was adopted, and extended to thirty-one thousand nine hundred feet, which was measured three times carefully over with a fifty feet chain, using iron pins. I have drawn out a separate diagram of the triangles calculated from this base as a comparison with the results obtained from more exact data. I ordered Mr. Edward Troughton, of London, to make a chain of one hundred feet in length, which might be applied to a flat surface of soil, not having the means of resorting to the more exact method of using coffer in measuring the bases, and he accordingly sent me one, consisting of twenty links, each five feet long, of a simple but accurate construction. An extract from

Mr. Troughton's letter may not be uninteresting.—“ The terminating lines of the iron chain were set off from the British brass standard, at the temperature of 65°. of Farenheit's thermometer, this is 10°. above the temperate point ; the correction for this, according to the expansion of iron with heat is .07704 of an inch upon the whole length, and those will be data for reducing that length for any other temperature ; the chain will, I think, require three people to carry it forward, for it should not be dragged on the ground : care must be taken in folding it : in the most accurate operations the pieces with sliding lines should be used for registering the end of the chain. In other cases the arrows may be sufficient, being more expeditious. As the accuracy of the chain is extreme, I leave you to judge if it may not supersede the standard which you ordered of me.”—To convince myself of the accuracy and power of this instrument, I measured on the lake of Castlebar, when frozen, a distance of near two miles, and by repeating the measurement it turned out, after making the necessary allowances for temperature, to come within one inch : a result I scarcely expected, and which proved its excellence for the purposes intended. This trial was made by lines of coincidences, using the sliding pieces of brass for registering correctly the length of each chain, as the surface of the ice was perfectly smooth. It was afterwards proved in several measurements on firm sands, dry at low water, and on level meadow-land, not to differ more than two inches in two miles. From the circumstance before stated, that Mayo afforded no flats, on sufficiently favourable ground, of more than two miles in length, I determined on having a series of short and accurate bases, in preference to long ones, which might be doubtful, from having been measured over an irregular surface.

The following were the bases measured :

	Feet
1. Base on the Moy plain flat meadow, subject to flood, in the barony of Gallen	6800
2. Base on the plain at the head of Lough Carra, in the barony of Carra, meadow and bottom	6330
3. Base on the sands of Killala, in the barony of Tyrawley	9500
4. Base on the sands between the island of Annagh and Inishbegit, in the half barony of Erris	9971.9
5. Base on the sands of Bertragh, barony of Murrisk	4545
6. Base in the barony of Costello, along a flat bog road	8600

7. Base over the ice, when the lake of Castlebar was frozen in the Barony of Carra, 11097.4 feet, and which was rendered of no use, as some idle person had destroyed the mark, which terminated the length of the base. I would recommend in all similar operations double marks within a few feet of each extremity. The bases were all measured twice. In repeating the measurements with Mr. Troughton's chain, I always observed that the lengths measured during the warm part of the day were minus when compared with the same lengths taken in the evening, when the cold had commenced. The thermometers always afforded an accurate correction. All the bases, with the exception of the one over the ice, were measured during the warm part of the summer; the corrections were small. In measuring over the ice of Castlebar lake in January 1814, Fahrenheit's thermometer stood at a mean of 29°; the temperature, when the chain had its terminating lines laid off from the British brass standard in the Tower of London, was 65°. of Fahrenheit's thermometer; this is a difference of 36°. and using the data given by Mr. Troughton, we shall have the following results:

	Feet
Length of base measured on the ice	11,100
$36 \times 007704 \times 111 = 30,785184 =$	<u>2,56543</u>
12	Correct length . 11097.43457

Base measured on the Moy plain.

First measurement	6800.
Mean of the thermometer 59° standard 65° difference 6° .	
$6 \times 007704 \times 68 = .046224 = 3.143232 =$	<u>.261936</u>
12	Correct length 6799.738064

Second measurement	6800.375
Mean of the thermometer 51°	
Standard 65° difference 14°	
$14 \times 68 \times 007704 = 7,334208 =$	<u>611184</u>
12	Correct length . 6799.763816

Base measured on the sands in the half barony of Erris.

First measurement	9971.5
Mean of the thermometers 72° standard 65° difference 7°	
$007704 \times 7 \times 9971.5 = 53771608 =$	<u>.448096</u>
12	Correct length . 9971.948096

Second measurement	9971.35
Mean temperature 73° Standard 65° difference 8°	
$007704 \times 8 \times 9971. = 614532672 =$	<u>.512110</u>
12	Correct length 9971.862110

I had every reason to be satisfied with the result of the measurements obtained by the chain. I had ordered Mr. Troughton to make a theodolite, two feet diameter, although not for the express purpose of this survey, yet I had it in contemplation to observe with it the large triangles. Mr. Troughton had been much engaged, and after waiting a considerable time, I despaired of receiving the instrument. The Grand Jury were anxious for the progress of the Survey, when I resolved upon commencing the triangulation with a theodolite seven inches diameter, which I had intended to use, in combination with the large one, and which gave, in observing the three angles of a triangle, a difference of not more than one minute, and in many instances to thirty seconds. I was not able to observe all the angles of each triangle, a proceeding which ought to be strictly attended to in all trigonometrical operations; and in the planning of triangles to have them as nearly equilateral as possible. The observations from my instrument were not sufficiently minute to warrant any spherical correction for the triangles, which I greatly regret; but, having so many bases, I possessed the means of verification on all sides, and, as will be seen by the map of triangles, was seldom doubtful of more than twenty-five feet. Though I am well aware that the results of this survey cannot by any means be compared to the great operations commenced in England by General Roy, and carried on by Colonel Mudge and Major Colby under the Board of Ordnance, or to those of France under Delambre, Mechain, Arago, and Biot, I am yet inclined to think they may be made useful in correcting our maps of Ireland, and that a collection even of similar observations would not only be serviceable in improving the geography of this kingdom, but is much wanted for the safety of the navigator. As a proof of this, I here subjoin a few observa-

tions for determining the latitude of Castlebar steeple ; also a table of latitude obtained from the various maps and charts published of Ireland, by which it will appear that almost every headland requires to be verified and corrected.

Observations taken by a ten inch Sextant at Castlebar Steeple.

1823.	☉ Meridian Altitude.	Latitude.
January 6	15.11.45	53.49.35,9
18	15.34.40	53.49.59,9
19	15.46.45	53.49. 8,3
21	16.12.39	53.49.51,4
24	16.53.39	53.50. 1,2
Feb. 5	20. 8.44	53.49.53,4
15	23.21.54	53.50. 9,2
16	23.42.19	53.49.49,
28	28.03.15	53.50. 3,6
March 9	31.30.15	53.50.35,9
April 11	44.18.48	53.50. 0,7
May 1	51. 6.14	53.49. 0,2
		53.49.50 mean.

Table of Latitude from Maps and Charts of Ireland.

	Mc. Kenzie's Charts.	Taylor's Map.	Arrowsmith's.	Beaufort's.	Ballast Office Map.	Huddart's Chart.
Shark Head	53.32.30	53.29.30	53.40. 8	53.20. 0	53.35.40	53.39.30
Achill Head.....	53.59. 0	53.48.20	54. 5. 0	53.58. 0	53.55. 0	54. 2. 0
Erris Head	54.18.30	54.12.20	54.27.20	54.18.20	54.18. 0	54.23.20
Killala	54.11. 0	54. 6. 0	54.17. 0	54.12.20	54.13. 0	54.16.30
Castlebar .....	... ..	53.42.15	53.54. 0	53.50. 0	53.51. 0	...
Clare Island Light-house.....	53.51.30	53.41.50	53.54. 0	53.49.30	53.49.30	53.53.30
(1) Inishtrahul Light-house	55.24.30	55.21. 0	55.23. 0	55.23.40	55.26. 0	55.27.30
Copeland do.....	54.37.30	54.44. 0	54.42.30	54.40.30	54.52.30	54.41. 0
Arranmore do. Donegal	54.59.30	54.55.30	54.58.30	55. 1.30	55. 0. 0	55. 1.40
Fannet Light-house, Loughswilly..	55.14. 0	55.12. 0	55.15. 0	55.16.40	55.17.30	55.17. 2
Pigeon house do. Dublin Bay .....	... ..	53.21. 0	53.21.40	53.21. 0	53.31. 0	53.21. 0
Arran do. Galway Bay.....	53. 4.40	52.57. 0	53. 7. 0	53. 6. 0	53. 6. 0	53.10.30
Wicklow Head Light-house.....	... ..	52.58. 0	52.58. 0	52.58.30	53. 0.30	52.58.30
(2) Loop Head do.....	52.22.10	52.20. 0	52.37. 0	52.31. 0	52.32. 0	52.29. 0
(3) Kerry Head	52.16. 0	52.12. 0	52.29.30	52.23. 0	52.22. 0	52.21. 0
(4) Cape Clear Light-house	51.21. 0	51. 9.20	51.19.20	51.19.30	51.23. 0	51.21.20
(5) Kinsale do.	51.35. 0	51.22. 0	51.34.40	51.37. 0	51.36.20	51.36. 0
(6) Hook Light-house, Waterford	52 5.20	52. 1. 0	52. 5.40	52. 6. 0	52.13.30	52. 9.20
(7) Tusker do.....	52.11.20	52. 4. 0	52.12.30	52.13. 0	52.18. 0	52.12.30
Smalls Light-house, by Survey of England 51°43'.18"	not laid down,	not laid down,	not laid down,	51.49. 0	52. 0. 0	51.43. 0
Bengore Head.....	55.12. 0	55.13.30	55.15.20	55.15.30	55.19. 0	55.16. 0
Brandon Head.....	52.10.30	52. 5. 0	52.22. 0	52.17. 0	52.16.30	52.15. 0
(8) Cork .....	... ..	51.42. 0	51.53.50	51.54. 0	51.54. 0	... ..
Dursey Island, deduced from Cape Clear.....	51.29.30	... ..	... ..	... ..	... ..	... ..
Dursey Island, deduced from Kin- sale	51.30. 0	... ..	... ..	... ..	... ..	51.32. 0
(9) Tory Island, westhead.....	55.13.30	... ..	... ..	... ..	... ..	55.16.40
Martin Head	55.21. 0	... ..	... ..	... ..	... ..	55.24.30
Centre of Tory Island, Longitude west from Greenwich .....	... ..	... ..	... ..	8. 6. 0	8. 1. 0	8.12. 0

- (1) Inishtrahul, by Mr. Lamont's Observations 55°.26'.28". See Purdy's Memoir descriptive of the Chart of the Atlantic, 1817.
- (2) Loop Head, by Captain Shortland 52°.37'.0". Do. do.
Do. do. In Huddart's large Sheet Chart of the Shannon it is mentioned by Mc. Kenzie Latitude 52°.24'.0". by Captain Shortland 52°.37'.0", mean 52°.31'.0", the latitude obtained by me from Mc. Kenzie's Chart is 52°.22'.10", and the Light House laid down in Huddart's Chart is 52°.29'.0".
- (3) Kerry Head, by Captain Shortland 52°.30'.0". Memoir Atlantic.
- (4) Cape Clear, by Admiral Knight 51°.25'.0", by Captain John Udney 51°.28'.22", by Captain John Wilson 51°.27'.45". The two last were commanders from the River Clyde. Mean result of varying authorities 51°.26'.0", Memoir Atlantic.
- (5) Kinsale Light House by Huddart's Chart of 1812, 51°.31'.0".
- (6) Hook do. do. do. of 1812, 52°.5'.0".
- (7) Tusker do. do. by Mc. Kenzie's Chart 52°.11'.0". deduced from Cape Clear. If the sheets were correctly joined the result would be 52°.12'.0".
- (8) Cork, by Dr. Longfield 51°.53'.54".
- (9) Tory Island west head, from the chart of the West Coast, by Mc. Kenzie 55°.12'.0".

Barometrical and trigonometrical height of the mountains and hills in Mayo.

	Feet over the Sea	
	Barometrically.	Trigonometrically.
CROAH PATRICK, or the Reek.		
Mean of three Observations from sands of Bertra	...	2509
Two from Carramore . . . . .	...	2536
Do. from Corvockbrack . . . . .	...	2530
Do. from Oughty . . . . .	...	2514
Two from Runa . . . . .	...	2528
From Myles' Monument, Clare Island . . . . .	...	2556
		15173
		2528 mean
Mean of two by the Barometer	2532	
FURMNAGAR.		
From the Reek . . . . .	...	2562
By the Barometer	2569	
KNOCK-NA-MUITREA.		
From the Reek . . . . .	...	2729
Do. do. . . . .	...	2737
Do. Myles' Monument . . . . .	...	2724
Do. Carramore . . . . .	...	2711
CORVOCKBRACK.		
From Runa, mean of two . . . . .	...	1281
Do. Carramore . . . . .	...	1281
By the Barometer	1254	
OUGHTY.		
By the Barometer	1092	
From Corvock . . . . .	...	1097
AULMORE-HILL.		
From Runa . . . . .	...	922
Do Carramore . . . . .	...	936
Do. Corvockbrack . . . . .	...	919
INISHTURK (Tower-hill).		
Mean of four . . . . .	...	591
Cusamecurragh . . . . .	...	2412
NEPHIN.		
From Kilalla Bay . . . . .	...	2658
Do. Cruoghmore . . . . .	...	2621
Do. Do. . . . .	...	2635
From the Puntoon by the Sextant . . . . .	...	2633
		2639 mean.

Barometrical and trigonometrical heights of the mountains and hills in Mayo.

	Feet over the Sea.	
	Barometrically.	Trigonometrically.
MENAAAN, in Achill Island. From Myles' Monument	...	1512 1530 2290
Birreencorragh, mean of three	...	221
Raithhill	...	347
Tarmon-hill	...	2180
Slievemore, mean of three	...	1693,1700
Currawa	...	2254,2266
Keem	...	2380,2367
Curslieve	...	750
Bonmore	...	296
Carrigohara	...	
Burran	...	229
By the Barometer, mean of two Observations	215	
Shraigheen-hill	...	431
Tully	...	125
South station, Ox Mountains	...	1300
North Do. do.	...	1313
Knock Shandrim	426	425
Maumechoy	...	1226
Greenane	..	1278
2d.	...	1261
3d.	...	1280
4th.	1269	
Spinkeen	705	
Sronevoca	928	
Spink	849	
Burran	1211	
2d.	1220	
3d.	1210	
Highest point of Cultivation } in Mayo	819	
Knock-na-Deludy, West top	873	
Do. do. East do.	865	
Barny-na-gee	619	
2d.	612	
Burranbeg	877	
Sluiane	377	
2d.	374	
3d.	369	
Devlin	...	862
Drimore	...	220
Slievebohane	...	1262
Spelagadane	...	625
Rahainbar-hill	744	
Knock Raplaghane	749	
Benbuy	698	
Cruoghmore	1397	1412
2d.	1417	1406

Barometrical and trigonometrical heights of the hills and mountains in Mayo.

	Feet over the Sea.	
	Barometrically.	Trigonometrically.
Maroguin	122	
Glen-hill ,	481	
Gortmore	794	
Aughalashen	409	
Glencastle-hill	755	
Knocklettacuss	1596	
Trista-hill	429	
Slieve Carn . . . . .	...	829
Mullranageegh . . . . .	...	396
Croghan . . . . .	...	690
Kelgarrow . . . . .	..	650
Mulaghanoe . . . . .	...	744
Bockagh . . . . .	...	702
Brusnagh . . . . .	...	622
Cappagh . . . . .	...	474
Knock . . . . .	...	385
Farnaan . . . . .	...	377
Kiltulla . . . . .	...	415
Farm-hill . . . . .	...	307
Greenwood . . . . .	...	387
Carn Mask . . . . .	...	184
Kellroe . . . . .	...	262
Benleva (East Carn) County Galway . . . . .	...	1225
The Barometers used were those of Sir Henry Englefield.		

NOTE.

In determining the heights barometrically two barometers were used, one remained stationary at a given point, where observations were made at given intervals of time, and the other carried up over the hills and mountain ridges, where corresponding ones were taken. From the number of elevations I have been enabled to execute a model of the Barony of Morrisk, which contains one hundred and eighteen square miles of the most elevated part of Mayo, and another of the Island of Achill, the largest island on the coast of Ireland, containing thirty-six square miles of very lofty ground. The Model of Morrisk is seven feet six inches by five feet. Achill model is five feet three inches by three feet ten inches; they represent all the roads, lakes, rivers, rising grounds, hills, mountains, houses, villages, towns, &c. &c. &c.—The horizontal and perpendicular scales of the models are five inches to the Irish mile.—It is to be regretted, when the great survey of England was begun, that the country had not been modelled as the survey advanced, whereby the whole elevations of England should have been correctly determined for the construction of the Model, and the heights engraven on the maps published by the Board of Ordnance would then have added considerably to their merit. A model on a scale of four inches to the mile of Great Britain and Ireland with their numerous isles, the long, broken, indented outline of coast, the lofty extensive ranges of mountains in Wales, Scotland, Ireland, and the islands, would give a character and expression to this work of art which could not be surpassed.

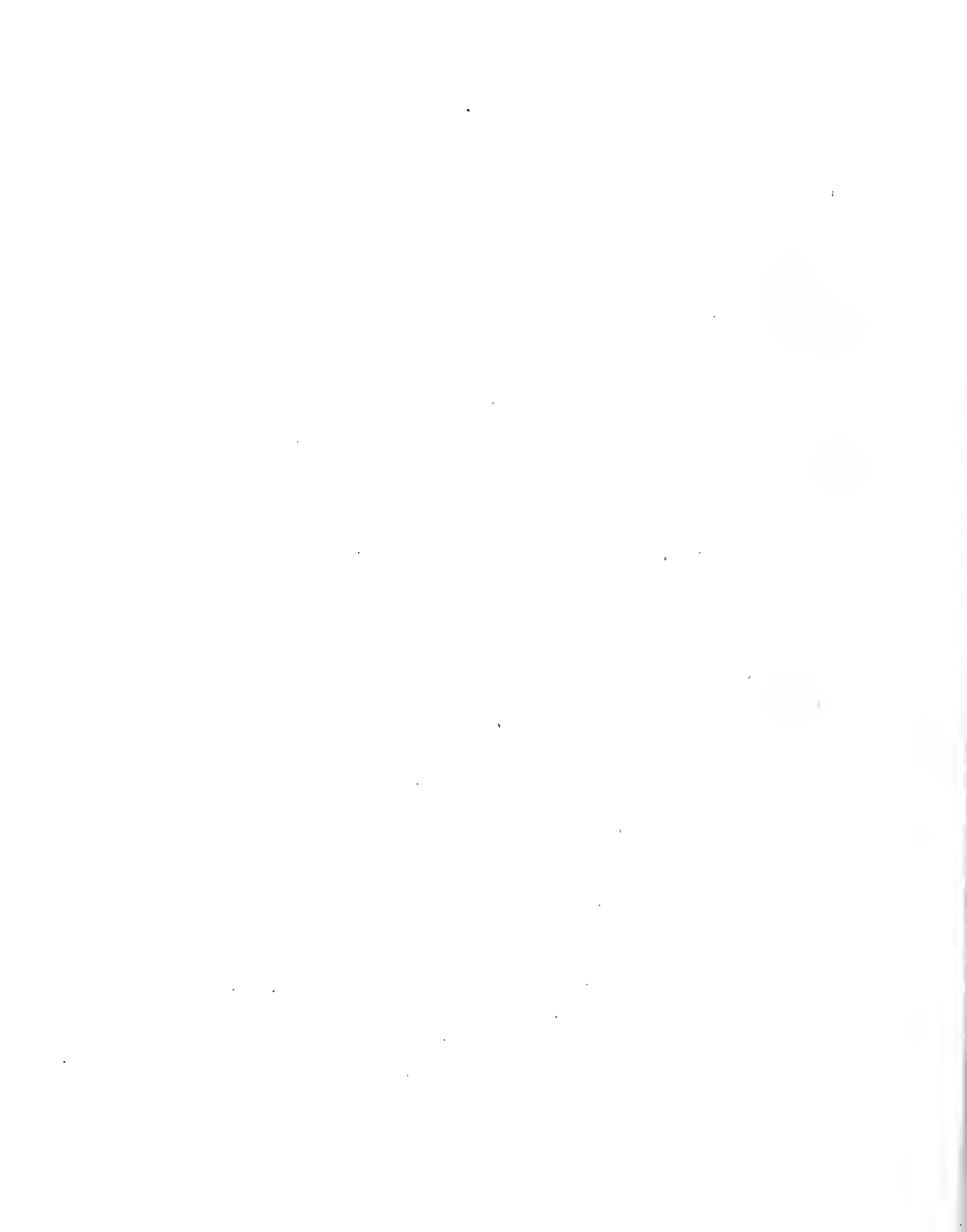
DESCRIPTION OF PLATE IV.

The chain used in measuring the bases is one hundred feet long, consisting of twenty links of hard round iron, one quarter of an inch in diameter, which are simply hooked together by folding down the extremities of the bar, and pinning them to the body, as represented in Fig. I. PP.

Fig. 2. Represents the handles or extreme links, with the terminating point marked by a line AB drawn on a square piece of brass affixed to the link, and having also a notch B into which the pin Fig. 5 could be placed upon occasions when great accuracy was not required.

Fig. 3. The mark for each length of the chain, being a square plate of brass, with four spikes or prongs beneath to hold it firm on timber, ice, or on the ground, with a moveable piece C, which slides along a groove, so as to coincide with the terminating line AB in Fig. 2.

Fig. 4. A staple or grape to be pushed down into the ground over the handle, Fig. 2. to keep the chain steady while the adjustment is made.



A Letter from William Edgeworth, Esq. Civil Engineer, to Alexander Nimmo, Esq. Civil Engineer, M.R.I.A. communicated by Mr. Nimmo.

Read January 1, 1823.

Dublin, January 1, 1823.

DEAR SIR,

AT your request I send you an account of a few of the principal triangles upon which the map of the county of Roscommon was constructed.

I have calculated the sides from a base measured on the road from Longford to Edgeworthstown, an account of which was published in my father's Report on the Bog District, No. 7, and, with a diagram of some triangles, is to be found in the Second Report of the Commissioners for improving Bogs in Ireland.

On my map of the county of Longford I have published the principal triangles upon which it was founded; and the latitude was determined from observations of the pole star, with an instrument of sixteen inches diameter, that Major Taylor most kindly lent to me.

The longitude of Edgeworthstown was determined from the Observatory of Dublin, by the valuable assistance of Dr. Brinkley, who was so good as to make corresponding observations of white-lights and explosions of gunpowder; four in one night agreed with the mean, within a second of time.

So that the longitude of the stations in the county of Longford may be considered as certain within a furlong. I have connected the triangulation through Roscommon with some of the stations made use of by Mr. Bald in his excellent map of Mayo.

Even with the slight data, that I can now give, the difference of latitude and longitude of the east and west coast of this island is known within a few seconds of time. The principal angles in Roscommon I took in the year 1814, with a six inch theodolite made by Troughton.

But I am now in possession of a repeating circle of eighteen inches diameter of his make ; and a repeating theodolite of Reich-enback, which, from the trials that Major Colby and Captain Kater kindly encouraged me to make of this instrument, at some of the trigonometrical stations in England, in comparison with the celebrated theodolite of Ramsden, I think I could be as certain of an angle to two seconds, as formerly I was to twenty seconds.

So that it would be well worth while to employ this repeating theodolite to correct, by a few well chosen triangles, Galway and Sligo with Dublin, and to determine exactly the distance on the meridian between Dublin and Armagh Observatories. A few more triangles would connect Armagh with the stations on the coast of Ireland, which have been intersected by Major Colby.

If I were to give a diagram of all the triangles that I determined in Roscommon, you would find a station nearly in every square mile, as my object was to secure the accuracy of the map.

The manner in which I laid down the triangles on paper may be found useful to those few who are employed in similar labors. After having carefully drawn mile squares of four inches asunder, and laid down a long base, I made use of a nine inch protractor of Troughton's, with extending conical points. Over one of these

points I placed a little pin hole in thin brass, so that I could see the opposite point through it; and, instead of marking the paper with the points, I intersected a little square cube with a fine perpendicular line marked on it, where the station to be determined was likely to come. I moved it back and forwards, till the protractor, when set to the division, showed where the line should be drawn, which I did without taking up the protractor. In this way I marked every station round, at once, from the angles in the field book.

This may be called surveying on paper, as I made use of the protractor in laying down the angles, as I had done the theodolite in the field.

And when the paper was kept of equal dryness in the large triangles, I could perceive an error of a minute.

I here give you a table of the angles to twenty seconds, and the sides calculated in feet, with the latitudes and longitudes of a few of the stations.

I am, dear Sir,

Your's sincerely,

WILLIAM EDGEWORTH.

*Distance from Lanesborough windmill to Cairneclanhugh 77045 feet,
by 2d Report on the Bogs.*

Names of Stations.	Angles.	Distances
		Feet.
Lanesborough .	93.45. 0'	
Cairneclanhugh	18.23. 0	
Slievebawn .	67.52. 0	
Slievebawn from { Lanesboro		26231
{ Cairneclh.		82996
Cairneclanhugh	31.36.30	
Slievebawn .	95.56. 0	
Elphin palace .	52.27.30	
Elphin from { Cairneclh.		104112
{ Slievb.		54860
Cairneclanhugh	49.47.40	
Elphin . . .	78. 9. 0	
Moydow* . . .	52. 3.20	
Moydow { Cairneclh.		129207
{ Elphin		100829
The angle at Elphin palace, between Moydow and Bishop Law's, Meridian line . . .	3.25.20	
Elphin . . .	91.20.20	
Moydow* . . .	31.57. 0	
Fairymount Clump	56.42.40	
Fairymount from { Elphin		63830
{ Moydow		120588

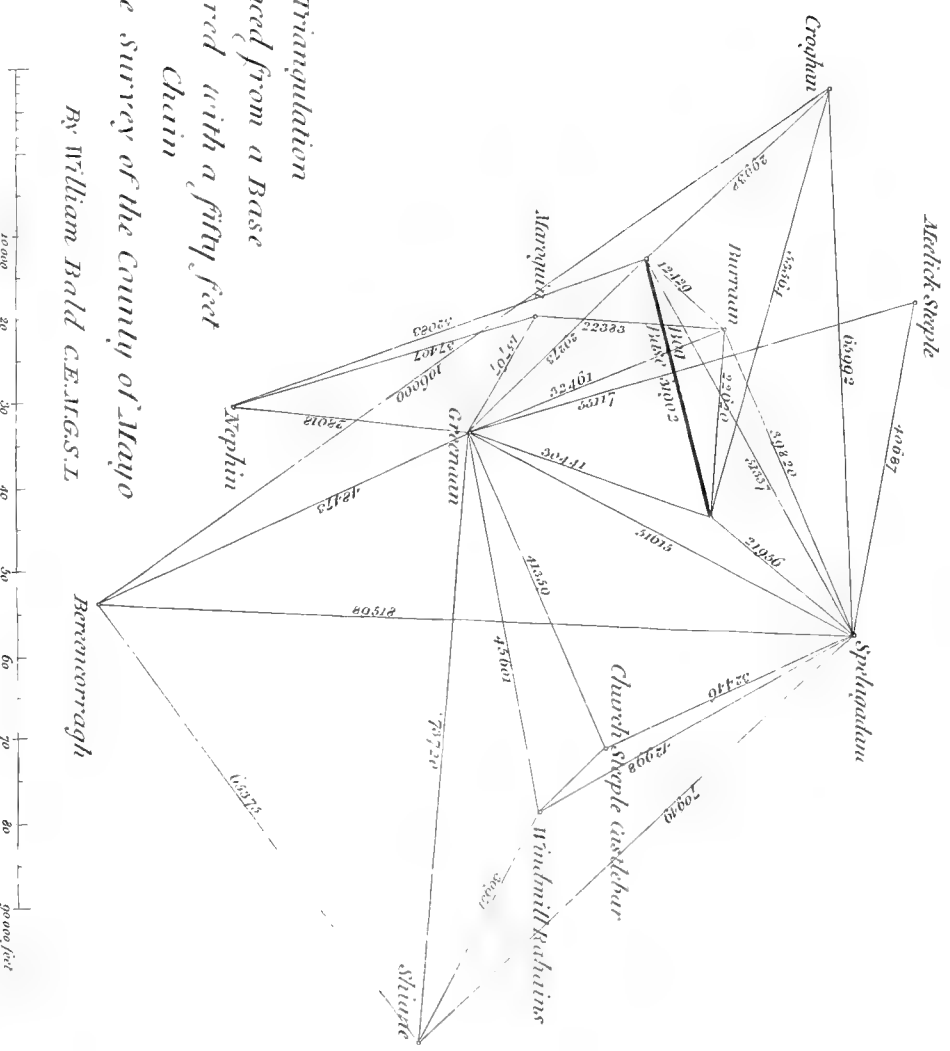
Names of Stations.	Angles.	Distances
Moydow* .	38. 1.20	
Fairymount .	72.21.40	
Slieve Dert .	69.37. 0	
Slieve Dert from { Moydow		122594
{ Fairymnt.		79240
Fairymount .	9. 9.20	
Slieve Dert .	40.53. 0	
Kiltulla, West Stone	129.57.40	
Kiltulla from { SlieveDt.		16450
{ Fairymnt.		67665
By Mr. Bald's base in the east of Mayo . . .		67728
By his Lough Carra base . . .		67473
Names of Stations.	Latitude.	Longi- tude.
Lanesborough .	53.40. 1	7.55.58
Elphin . . .	53.50.56	8. 8.31
Fairymount .	53.50.32	8.26.15
Kiltulla . . .	53.42.47	8.39.43
Slieve Dert .	53.40.5½	8.39.22
Moydow . . .	53.34.24	8. 6.51
Slievebawn . . .	53.43. 4	8. 1. 7

* The angles at this station were not observed.

Names of Stations.	Latitude.	Longitude.
Castlebar Spire .	53.51.15	9.14.54
Croaghpatrick .	53.45.32	9.36.28
Mulrea . . .	53.38. 8	9.46.44
Clare Island Light House	53.49.32	9.55.55
Achill Head .	53.58.13	10.12.25
Mullet tower .	54.15.22	9.54.38
Glinsk tower .	54.18.46	9.33.58
Downpatrick Head	54.19.36	9.17.59

I have calculated the above, from intersections that I took of Croaghpatrick, in connection with Mr. Bald's triangulation of Mayo. The radius of the equator taken at 20918230 feet, and the ellipticity $\frac{1}{338}$.

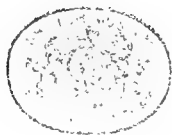




*First Triangulation
Commenced from a Base
Measured with a fifty feet
Chain
for the Survey of the County of Mayo*

By William Bald C.E.M.G.S.T.





Plan
of the
Triangles to the Survey of the County of
W. IRE
made by order of the Grand Jury
Under the Direction of
William Hall Esq. Surveyor
and Master of the National Survey
London



The figures on the sides of the Triangles show
the mean of the calculated distances in feet
If the stations the figures express the mean heights
over the sea at high water ordinary spring tides
—Scale seven feet to the half inch —

The bases were measured with a chain two feet long
by W. Crosthorn and had the terminus points laid off
from the British Brass Standard in the Tower of London
at the temperature of 63° of Fahr° Thermometer

10. 10. 1942

10. 10. 1942

10. 10. 1942

10. 10. 1942

10. 10. 1942

10. 10. 1942

10. 10. 1942

General Section

Of the Mountains of the County of Mayo.

Between Longitudes 6 and 6 50

And Latitudes 57 20 and 57 20 20

As drawn and calculated by M R C A

At the meeting of the Society of

London

MOUNTAINS OF THE COUNTY OF MAYO

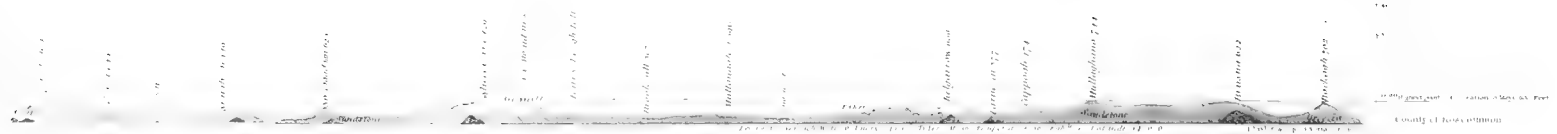




Fig. 4.
Grape for holding the Chain
to be applied within the Handle

PLAN of the Chain used in
measuring the bases for the Trigonometrical Survey
of
MAYO

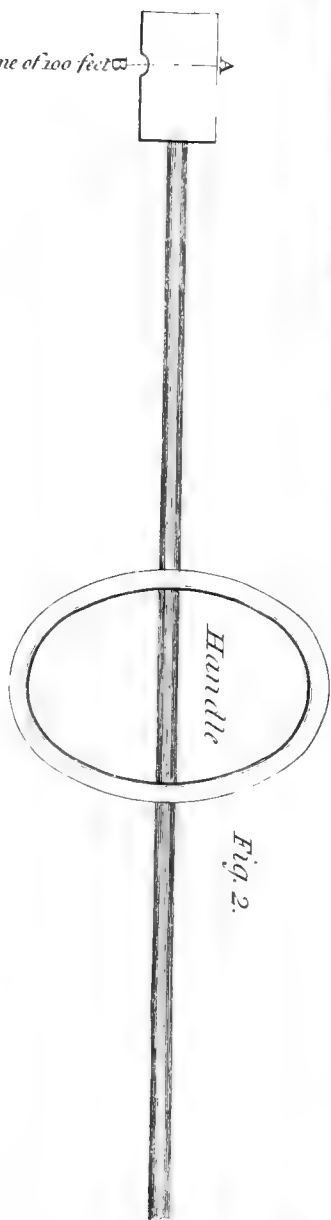


Fig. 2.

Fig. 3.



Terminating line of 100 feet

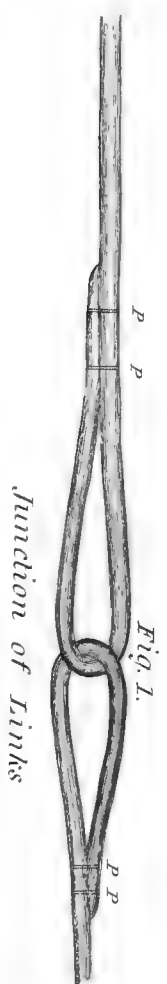
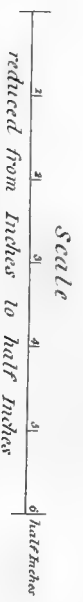


Fig. 1.

Junction of Links



Scale

reduced from Inches to half Inches

to be applied to the end of the Chain
when measuring by lines of coincidence

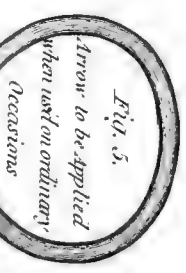
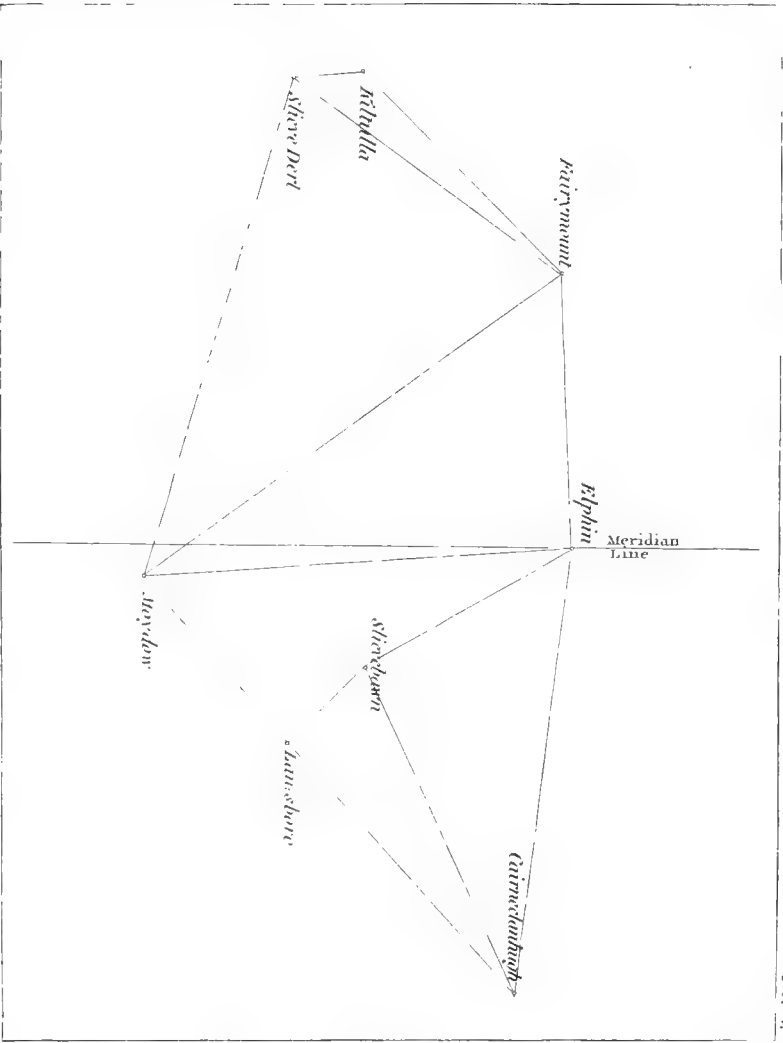


Fig. 5.

Arrow to be applied
when used on ordinary
Occasions





*On the General Properties of Algebraic Surfaces, by the Rev.
Dionysius Lardner, M. R. I. A.*

Read May 24, 1824.

(1) **SURFACES** represented by algebraic equations have many properties analogous to those of algebraic curves, which have been investigated in the twenty-first section of the first Part of my Geometry. These properties are, for the most part, investigated on principles exactly similar to those used in that section, and it will be therefore unnecessary to enter with the same minuteness into the details of the reasoning.

Surfaces, like plane curves, are classed according to the degrees of the equations which represent them, and for the same reasons. An equation between three variables may not always represent a surface of that degree marked by its dimensions. This happens when it is capable of being resolved into rational factors of inferior degrees, in which case it represents as many different surfaces of inferior orders. It may even represent only a system of planes, which takes place when it can be resolved into rational and real factors of the first degree. Thus the observations in (598) and (599) of the Geometry apply equally to surfaces represented by algebraic equations.

PROP.

(2) *To determine the number of given points through which an algebraic surface may be subjected to pass.*

If the coordinates of the points be successively substituted in the equation of the surface, there should be as many equa-

tions as there are constant quantities. The number of points therefore is equal to that of the constants of the equation. See (600) Geometry.

PROP.

(3) *To determine the greatest number of points in which a right line can meet an algebraic surface.*

Let x and y be eliminated by the equation of the surface and those of the right line, by substituting their values derived from the latter in the former. The result will be an equation of the form.

$$Az^n + Bz^{n-1} + Cz^{n-2} \dots \dots \dots Mz + N = 0,$$

the surface being supposed of the n^{th} order. The number of real roots of this equation cannot exceed n , and it therefore follows that the number of points where the right line meets the surface cannot exceed n . As the roots may some or all be impossible, the line may meet the surface in a less number of points, or in none.

Hence *every algebraic surface may be intersected by a right line in as many points as there are units in the exponent of its order, but not in more.*

PROP.

(4) *To determine the curve of the highest order in which two algebraic surfaces, the exponents of whose orders are m and n can intersect.*

Assuming the general equations of the m^{th} and n^{th} orders between three variables, if the variables were successively eliminated the

results would be three equations between each pair of the variables, and these equations would be of the mn^{th} degree. (See note on (602,) Geometry.) Hence the curve sought is of the mn^{th} degree.

PROP.

(5) *Three right lines intersecting at the same point, intersect an algebraic surface; to determine the relation between the continued product of the intercepts of each between their common intersection and the surface.*

Let these right lines themselves be assumed as axes of coordinates. In order to determine their intercepts between the origin and the surface let each pair of variables be successively suppose = 0. The result will be three equations of the forms

$$\begin{array}{llll} Ax^n + Bx^{n-1} + Cx^{n-2} & . & . & . & Mx + N = 0. \\ A'y^n + B'y^{n-1} + C'y^{n-2} & . & . & . & M'y + N = 0. \\ A''z^n + B''z^{n-1} + C''z^{n-2} & . & . & . & M''z + N = 0. \end{array}$$

The continued products of the roots of these equations are respectively $\frac{N}{A}$, $\frac{N}{A'}$, $\frac{N}{A''}$, hence the ratio of each pair of these products is the reciprocal ratio of the coefficients of the highest powers of the variables respectively which enter the equations whose roots are their factors. As the transformation of origin does not affect the values of A , A' , A'' , these ratios remain the same for all parallel systems of axes. Therefore *if three right lines parallel to three right lines given in position and intersecting at the same point intersect an algebraic surface of the n^{th} order, the continued product*

of their segments between their common intersection and the surface will be in a constant ratio. (Geometry, 606.)

(6) If a general equation of the n^{th} degree between three variables be arranged according to the dimensions of one of them, z ,

$$C. z^n + A_1 z^{n-1} + A_2 z^{n-2} + A_3 z^{n-3} + \dots + A_n = 0.$$

it is evident that A_1 will be a formula of the first degree between x and y , A_2 one of the second degree between these variables, and in general A_n a formula of the n^{th} degree between them.

For each system of values of x and y this equation gives n values of z , which when real determine as many points of the surface. The sum of these values is $-\frac{A_1}{C}$. If a surface be assumed, represented by the equation

$$z = -\frac{A_1}{nC}$$

it will have the property of intersecting the ordinate z , so that the sum of the intercepts between it and the surface on the one side shall be equal to the sum of the intercepts on the other side. Since A_1 has the form $Ay + Bx + D$, the equation of this surface is

$$Ay + Bx + ncz + D = 0;$$

it is therefore a plane. This plane therefore intersects a system of parallels to the axis of z , so that the sums of the intercepts between it and the surface on each side are equal. Such a plane may be called a diametral plane from its analogy to the diameter of a plane curve.

Such planes may be found relatively to every system of axes of coordinates. It therefore follows that an algebraic surface has an infinite number of diametral planes.

The sum of every two values of z is $\frac{\Lambda_2}{c}$ and the number of these products is $\frac{n \cdot n-1}{1 \cdot 2}$. Hence a surface represented by the equation

$$z^2 - \frac{\Lambda_1}{nc}z + \frac{2\Lambda_2}{n \cdot n-1 \cdot c} = 0.$$

will have the same diametral plane with the given surface, and also the rectangle under the coincident values of z , for this surface will be equal to the $\frac{n \cdot n-1}{1 \cdot 2}$ th part of the sum of rectangles under every pair of corresponding values of z for the proposed surface. It follows therefore that the sum of the positive rectangles under the intercepts of the values of z between this surface and the given surface is equal to the sum of the negative rectangles. Since Λ_2 is a formula of the second degree between x and y , it follows that the surface possessing this property is one of the second degree.

It follows in general that a series of surfaces may be thus determined of degrees inferior to that of the given surface, and having properties with respect to it similar to those of curvilinear diameters with respect to plane curves. Such surfaces may be called *diametral surfaces*. (Geometry, 607.)

An *absolute diametral plane* is one which bisects its ordinates. It is evident all diametral planes of surfaces of the second degree must be absolute.

In order that a surface should admit an absolute diametral

plane, it is necessary that a transformation of coordinates, which would make all the terms involving odd powers of the variables disappear, should be possible ; and as this is not always the case, surfaces of degrees exceeding the second may not have an absolute diametral plane.

(7) The centre of a surface is a point which bisects all right lines passing through it and terminated in the surface.

PROP.

(8) *To determine when an algebraic surface has a centre.*

If the origin be at the centre, the value of z corresponding to $+x$ and $+y$ ought to be equal and opposite to that corresponding to $-x$ and $-y$; or which is the same, it is necessary that the equation should not be affected by changing the signs of the three coordinates. In order that this should take place, it is necessary that the sum of the exponents of the variables should be either *even* or *odd* in all the terms of the equation. If a change of origin which will produce this effect be possible, the surface has a centre ; otherwise not.

An investigation of the Lines of Curvature of Ellipsoids, Hyperboloids and Paraboloids, with a view to the improvement of the Theory of the structure and decoration of Domes. By the Rev. Dionysius Lardner, A. M. M. R. I. A.

Read June 14, 1824.

THERE is no department of architecture in which the principles of geometry are more usefully or elegantly applied than in the theory of the structure and decoration of domes. A dome is a vault or roof, forming a segment of a curved surface, the concavity of which is turned inwards. All horizontal sections should be similar figures, and it should be supported by a base of the same figure. It is however by no means necessary that the edifice over which the dome is to be thrown should be of this figure, for there are methods well known to architects, but which would be foreign to my present object to enter upon, by which any polygonal base may be made to terminate in a circle, or in such other curve as may be required. From this curve a cylindrical wall may be erected, on which the dome is to be raised. Domes are denominated circular or elliptical, according to the base on which they are constructed, which is usually one of these figures. Domes, which rise higher than the semitransverse axis of the base, if they be elliptical, or than the radius of the base, if they be circular, are called *surmounted domes*; those whose altitude is less than the semiconjugate axis of the elliptic base, or than the radius of the circular base, are called *surbased domes*. Elliptical domes of an intermediate altitude

are called *mean elliptical* domes, and a circular dome, whose altitude is equal to the radius of the base, is called an *hemispherical dome*. When the base of the dome, and therefore all horizontal sections of it, are circles, it is a surface of revolution, and is commonly called *cupola*.

The lines of curvature of the domical surface are peculiarly calculated to suggest not only principles for the construction of the dome, but point out the most natural and elegant decorations for it; decorations not depending on the fancy or caprice of the architect, but arising necessarily out of the form and properties of the surface itself.

The perpendiculars to the surface passing through the several points of a line of curvature, form a surface perpendicular to the surface of the dome. There are two systems of lines of curvature on every surface, and the lines of each system intersect those of the other system at right angles. If several lines of each system be described upon the domical surface, they will divide the whole vault into regular and symmetrical compartments, included by curvilinear limits intersecting perpendicularly. The perpendiculars to the surface through all these lines will form curved surfaces, which will also intersect perpendicularly, and will divide a shell of the vault of any assumed thickness into voussoirs bounded by those rectangular curved surfaces. If, however, the lines of curvature be drawn sufficiently close, so as to reduce the magnitude of these voussoirs to a sufficiently small proportion to the entire magnitude of the dome, the bounding surfaces may be considered as planes, scil. the tangent planes to the normal developable surfaces already mentioned. The magnitude of the voussoirs must be regulated by the magnitude of the whole vault, and the peculiar nature of the materials of which it is constructed. The decorations

of the internal concave surface of the dome, as well as the external convex surface, should be all regulated by the directions of the lines of curvature, and by the compartments into which they resolve the surface. The position, directions, and general figure of these lines should be also attended to in the decoration and structure of the hall over which the dome is suspended. The columns, cornices, and the other ornamental parts of the building, both internal, and internal should harmonize with these lines.

There are in some surfaces points called umbilical points, which are so surrounded by the lines of curvature that they all turn their concavities towards them. On different sides of these points, therefore, the lines of both systems have their curvatures turned in opposite directions. In the decorations of domes having such points they should therefore be attended to, as they must immediately attract the eye from the peculiar disposition of the compartments of the dome which surround them. When such points occur in either of the principal vertical sections of the dome, and at any considerable elevation from its base, they would be adapted to receive any suspended ornament, such as lamps, lustres, chandeliers, &c. If these points, as is the case in the mean ellipsoidal dome, are placed upon the base, they suggest a peculiar disposition in the architectural decorations of the lower part of the hall.

The projections of the lines of curvature upon the floor of the hall point out the proper method of disposing its flagging, so as to correspond with the decorations already suggested for the other parts of the building. The methods of ornamenting an edifice, thus deduced necessarily from the very nature of the structure, while they set no limit either to the richness or the quantity of ornament,

dispose it in a manner simple and graceful, and calculated to display the peculiar nature and construction of the edifice itself.

The most common species of dome is a cupola, but it is far from being that which admits of the richest decoration, or which produces the most pleasing effect. If the building be low, and the base elliptic, a surbased ellipsoidal dome is probably the most elegant. If it be more elevated, it is necessary that the dome should be surmounted, because the increased elevation will necessarily diminish the apparent vertical height. The surfaces of domes are always however segments either of an ellipsoid, hyperboloid, or paraboloid. Of each of the latter surfaces there are two species, one only of which seems fitted for domes. I propose, in the following paper, to investigate the lines of curvature of these surfaces. Those of the ellipsoid have already been determined by Monge; however, as they can be all ultimately derived from the integration of the same equation, I shall include the ellipsoid to render the present investigation complete.

Of the lines of curvature of surfaces of the second degree.

The equation of those surfaces which have a centre related to the principal axes as axes of coordinates is

$$Az^2 + A'y^2 + A''x^2 + F = 0.$$

To determine the differential coefficients of the first and second order, let this equation be differentiated considering z as a function of xy ; the results will be

$$\frac{dz}{dx} = -\frac{A''x}{Az}$$

$$\frac{dz}{dy} = -\frac{A'y}{Az}$$

$$\frac{d^2z}{dx^2} = \frac{A'}{A^2z^5} (A'y^2 + F)$$

$$\frac{d^2z}{dx dy} = -\frac{A'A''xy}{A^2z^3}$$

$$\frac{d^2z}{dy^2} = \frac{A'}{A^2z^3} (A''x^2 + F)$$

Those surfaces, which have no centre, are represented by the equation

$$A'y^2 + A''x^2 + 2c''z = 0.$$

The principal axis being the axis of z , and the plane of xy being a tangent plane through the vertex of the surface.

The differential coefficients of the first and second order are, in this case

$$\frac{dz}{dx} = -\frac{A''x}{c''}$$

$$\frac{dz}{dy} = -\frac{A'y}{c''}$$

$$\frac{d^2z}{dx^2} = -\frac{A''}{c''}$$

$$\frac{d^2z}{dydx} = 0.$$

$$\frac{d^2z}{dy^2} = -\frac{A'}{c''}$$

Let these five coefficients be expressed by p, q, r, s, t , and let their values be substituted in the equation

$$\{s(1+q^2) - pqt\} \cdot \frac{dy^2}{dx^2} + \{r(1+q^2) - t(1+p^2)\} \cdot \frac{dy}{dx} + pqr - s(1+p^2) = 0.$$

(See Lacroix's Differential and Integral Calculus, 4to. Tom. I. p. 576, 2d edit.) The result of this substitution will, for central surfaces, be

$$\frac{dy^2}{dx^2} - \left(\frac{y}{x} - \frac{\Lambda - \Lambda''}{\Lambda - \Lambda'} \cdot \frac{x}{y} + \frac{\Lambda(\Lambda'' - \Lambda')}{\Lambda' \Lambda'' (\Lambda - \Lambda')} \frac{F}{xy} \right) \frac{dy}{dx} - \frac{\Lambda - \Lambda''}{\Lambda - \Lambda'} = 0$$

having eliminated z^2 by means of the equation of the surface. The substitution, for the surfaces which have no centre, gives

$$\frac{dy^2}{dx^2} - \left(\frac{y}{x} - \frac{\Lambda''}{\Lambda'} \cdot \frac{x}{y} + \frac{C''^2 (\Lambda'' - \Lambda')}{\Lambda'^2 \Lambda'' xy} \right) \cdot \frac{dy}{dx} - \frac{\Lambda''}{\Lambda'} = 0$$

These two equations are of the same form, and may therefore be integrated by the same methods. Let them be represented by the general form

$$\frac{dy^2}{dx^2} - \left(\frac{y}{x} - e \frac{x}{y} + \frac{f}{xy} \right) \frac{dy}{dx} - e = 0 \quad (\Lambda)$$

In which $e = \frac{\Lambda - \Lambda''}{\Lambda - \Lambda'}$ and $f = \frac{\Lambda(\Lambda'' - \Lambda')}{\Lambda' \Lambda'' (\Lambda - \Lambda')}$ for surfaces having a

centre, and $e = \frac{\Lambda''}{\Lambda'}$ and $f = \frac{C''^2 (\Lambda'' - \Lambda')}{\Lambda'^2 \Lambda''}$ for surfaces having no centre.

This might be integrated by resolving it into its factors, but more elegantly by ascending to a differential equation of an higher order. For this purpose let this equation be differentiated. The result is

$$\frac{d^2y}{dx^2} \left(2yx \cdot \frac{dy}{dx} + ex^3 - y^2 - f \right) + \left(\frac{dy^2}{dx^2} + e \right) \left(x \frac{dy}{dx} - y \right) = 0$$

By this and the first equation the constants e and f being eliminated, we find

$$xy d^2y + dy (xdy - ydx) = 0$$

Dividing this by x^2 it becomes

$$\frac{y}{x} d^2y + dy \cdot \frac{xdy - ydx}{x^2} = 0$$

Let $z = \frac{y}{x} \therefore dz = \frac{xdy - ydx}{x^2}$. By this substitution the equation becomes

$$zd^2y + dydz = 0$$

$$\therefore \frac{d^2y}{dy} + \frac{dz}{z} = 0$$

This being integrated gives

$$zdy = M dx$$

M being an arbitrary constant. Substituting for z its value, the equation becomes

$$ydy = Mxdx.$$

The integral of this is evidently

$$y = Mx^2 + N$$

N being a second arbitrary constant. This is the equation of an

ellipse or hyperbola according as $m < 0$ or > 0 . It is concentric with the ellipsoid and its axes coincide with those of x and y . Let its axes be a' and b' . The equation expressed in these terms is

$$a'^2 y^2 + b'^2 x^2 = a^2 b'^2$$

To determine the axes let this equation be differentiated

$$\frac{dy}{dx} = -\frac{b'^2 x}{a'^2 y}$$

Eliminating y and $\frac{dy}{dx}$ by these equations and (A) the result will be

$$ea'^2 - b'^2 = f$$

Subject to this condition the axes may be of any magnitude. Since b' and a' are the coordinates of the vertices of the angles of the rectangle circumscribed round the axes of each of the ellipses or hyperbolas, which are the projections of the lines of curvature upon the plane xy , it follows that the locus of these points is a curve represented by this equation, b and a' being coordinates measured upon the axes of x and y . Hence it appears that the two equations

$$\begin{aligned} a'^2 y^2 + b'^2 x^2 &= a^2 b'^2 \\ ea'^2 - b'^2 &= f \end{aligned}$$

determine all the lines of curvature. The first determines the projections of the points of any one line of curvature corresponding to any system of values of a'^2 and b'^2 and the second determines the various systems of values of these last quantities.

If $A' = A''$, $e = 1$ and $f = 0$ and the equation (A) becomes

$$\frac{dy^2}{dx^2} - \left(\frac{y}{x} - \frac{x}{y} \right) \frac{dy}{dx} - 1 = 0$$

The integration is in this case more simply effected by resolving the equation into its factors, which are manifestly

$$\begin{aligned} \frac{dy}{dx} - \frac{y}{x} &= 0 \\ \frac{dy}{dx} + \frac{x}{y} &= 0 \end{aligned}$$

These equations being integrated give

$$\begin{aligned} y &= ax \\ y^2 + x^2 &= r^2 \end{aligned}$$

a and r^2 being arbitrary constants. The first, for each value of a , is, the equation of a right line through the origin. The second, for each value of r^2 , is the equation of a circle of which the origin is the centre. As these constants are not restricted by any condition, it follows that all right lines whatever in the plane xy passing through the origin, and all circles described upon the same plane, with the origin as the centre, are projections of lines of curvature, provided that there are points of the surface corresponding to the points on the plane xy , through which these right lines and circles pass. The condition $A' = A''$ renders the surface, one of revolution round the axis of z . If therefore it be an hyperboloid or paraboloid all circles and right lines whatever thus drawn are actual projections of lines of curvature, since these surfaces have unlimited extent. But if the surface be an ellipsoid, the greatest circle which can be a projection of a line of curvature is the section of the sur-

face by the plane xy itself, which is therefore a line of curvature. In this case, therefore, the real projections of the lines of curvature are the radii of this circle and all circles concentric with it and included within it.

If the equation of the surfaces which have a centre be expressed in terms of their semiaxes it will be

$$a^2b^2z^2 + a^2c^2y^2 + b^2c^2x^2 = a^2b^2c^2$$

If the surface be an ellipsoid a^2, b^2, c^2 , will be all positive.

If it be a double-surfaced hyperboloid a^2 and b^2 are negative, and c^2 positive.

If it be a single-surfaced hyperboloid a^2 and b^2 are positive, and c^2 negative.

The equation of the surfaces which have no centre may be expressed

$$y^2 + mx^2 = pz$$

where m expresses the ratio of the squares of the axes of all elliptic or hyperbolic sections perpendicular to the axis, and p the parameter of the parabolic section of the surface by the plane yz .

Since therefore for the surfaces having a centre

$$\Lambda = a^2b^2 \quad \Lambda' = a^2c^2 \quad \Lambda'' = b^2c^2 \quad F = -a^2b^2c^2$$

it follows that

$$e = \frac{\Lambda - \Lambda''}{\Lambda - \Lambda'} = \frac{b^2(a^2 - c^2)}{a^2(b^2 - c^2)}$$

$$f = \frac{\Lambda(\Lambda'' - \Lambda')}{\Lambda'\Lambda''(\Lambda - \Lambda')} = b^2 \cdot \frac{a^2 - b^2}{b^2 - c^2}$$

For the surfaces which have no centre, $A=0$, $A'=1$, $A''=m$, $c'=-\frac{p}{2}$

$$e = \frac{A''}{A'} = m$$

$$f = \frac{c''^2 (A'' - A')}{A'^2 A''} = \frac{p^2}{4} \frac{m-1}{m}$$

we shall consider $2a$ the greatest axis and $2c$ the least, in surfaces which have a centre. Also m will be considered greater than unity and p positive. These suppositions, while they simplify the investigation, do not impair its generality.

PROP.

To determine the lines of Curvature of the Ellipsoid.

The equation of the ellipsoid is

$$a^2 b^2 z^2 + a^2 c^2 y^2 + b^2 c^2 x^2 = a^2 b^2 c^2$$

The quantities e and f are therefore

$$e = \frac{b^2 (a^2 - c^2)}{a^2 (b^2 - c^2)}$$

$$f = \frac{b^2 (a^2 - b^2)}{b^2 - c^2}.$$

Since $a > b$ and $b > c$ the quantities e and f are essentially positive.

To determine the lines of curvature it will be necessary to investigate the loci of the equations

$$a'^2 y^2 + b'^2 x^2 = a'^2 b'^2$$

$$ea'^2 - b'^2 = f$$

There are four cases to be considered, according to the different signs the arbitrary constants a'^2 and b'^2 may assume. There are however two of these cases in which one of the loci is impossible. If $a'^2 < 0$ and $b'^2 > 0$, the second equation is impossible, for it would equate the sum of two quantities essentially negative with a quantity essentially positive. As therefore the equation of condition between the constants a'^2 and b'^2 cannot under these circumstances be fulfilled, there can be no corresponding lines of curvature. If a'^2 and b'^2 be both negative the first equation is impossible, and therefore there is no corresponding lines of curvature. The only cases therefore which remain to be investigated are where a'^2 and b'^2 are both positive, or b'^2 alone negative.

If a'^2 and b'^2 be both positive the first equation represents an ellipse, and the second an hyperbola. If $b'^2 < 0$ the first represents an hyperbola, and the second an ellipse. The semiaxes of the ellipse and hyperbola represented by the second equation are

$$A' = a \cdot \frac{\sqrt{a^2 - b^2}}{\sqrt{a^2 - c^2}}$$

$$B' = b \cdot \frac{\sqrt{a^2 - b^2}}{\sqrt{b^2 - c^2}}$$

With these common axes let an ellipse and hyperbola be described upon the plane xy . With the coordinates of any point of the ellipse as semiaxes, let an hyperbola be described upon the same plane, having its axes coincident with those of the surface, and with the coordinates of any point in the hyperbola as axes, let an ellipse be de-

scribed in the same manner.. The ellipse and hyperbola thus described will be the projections of lines of curvature of the given ellipsoid, and in the same manner the projections any number of such lines of curvature may be found. The ellipse and hyperbola with the common axes $2A'$ and $2B'$ may be denominated the directrices of the lines of curvature.

The greatest axis of the ellipsoid being $2a$, and the least $2c$, it follows that $a^2 - b^2 < a^2 - c^2$; and therefore $A' < a$. Hence the common vertices of the directrices fall within the ellipsoid.

Let $ABA'B'$ (Fig 1) be the section of the ellipsoid by the plane of xy , and $CA = a$, $CB = b$. And upon CA assume $ca = A'$ and upon CB produced, $cb = B'$. Let the ellipse $aba'b'$ be described and the hyperbola, $dad', d'ad'$, with the same axes. Any point p being assumed in the ellipse $aba'b'$ and its coordinates pm , pm' being drawn, let an hyperbola be described with the lines cm as semitransverse axis and cm' as semiconjugate axis. The branches of this hyperbola will be the projections of two lines of curvature. Let tangents be drawn through the vertices A, A' of the elliptic section, and any point P on the hyperbolic directrix, between these tangents $\tau\tau$ and $\tau'\tau'$ be assumed. The coordinates Pm , Pm' of this point being drawn, let an ellipse be described with cm and cm' as axes. This ellipse will be the projection of another of the lines of curvature upon the plane xy .

In like manner other points being assumed upon the ellipse $aba'b'$ or hyperbola dad' , any number of lines of curvature may be determined. As the point assumed upon the ellipse approaches the vertex b , the coordinate cm diminishes and cm' increases, therefore the transverse axis of the hyperbola continually diminishes, and the conjugate axis continually approaches to equality with bb' . When the vertex b itself is the assumed point, the transverse axis va-

nishes, and the conjugate axis becomes equal to bb' , with which both branches of the hyperbola coincide. Hence the axis bb' is the projection of one of the lines of curvature, which must therefore be the section of the surface by the plane yz .

As the assumed point approaches the vertex a , cm increases and cm' diminishes, therefore the transverse axis of the corresponding hyperbola continually increases, and the conjugate axis diminishes. When the assumed point is the vertex a itself, the conjugate axis vanishes, the transverse axis is aa' , and the branches of the hyperbola closing become coincident with the right lines aa and $a'a'$.

As the point p assumed upon the hyperbolic directrix approaches the vertex a , the conjugate axis of the corresponding ellipse diminishes as well as the transverse axis. When p coincides with the vertex a , the conjugate axis of the ellipse vanishes, and the transverse axis becomes equal to aa' with which the ellipse itself coincides. This axis of the surface being therefore the projection of one of the lines of curvature upon the plane xy , this line must be the section of the surface by the plane xz .

As the point p approaches the tangent τt , the axes of the corresponding ellipse both increase. When p coincides with the tangent at τ the axes become equal to those of the ellipse $ABA'B'$, with which the ellipse then coincides. This ellipse therefore, the section of the surface by the plane xy , is one of the lines of curvature.

When the point p passes the tangent, the corresponding ellipse includes the given surface within it, and therefore cannot be the projection of any line in the surface.

It is plain that the transverse axes of all the hyperbolas which are projections of lines of curvature are less than aa' , the common axis of the directrices; and all the transverse axes of the ellipses which are projections of lines of curvature, are greater than the same line

aa' . Hence it appears that the concavities of all these curves must be presented towards the points a, a' . The *major limit* of the conjugate axes of the hyperbolas is cb , and that of the similar axes of the ellipses is cB . The points a, a' are the projections of four points of the surface towards which the concavities of all the lines of curvature are turned. These points are upon the section of the surface by the plane xz . This section being itself a line of curvature all other lines of curvature which meet it intersect it at right angles. The projections of those which intersect it between the vertices of the axis $2c$ and the points whose projections are a, a' are hyperbolas. The projections of those which intersect it beyond these points are ellipses. Thus the lines of curvature perpendicular to the section by the plane xz change their species as they pass these points, presenting their concavities on both sides towards these points. These are called *umbilical points* of the surface.

The umbilical points of any surface may be determined by considering that they are those points at which the two lines of curvature interchange their species, and at which they therefore coincide. To find these points it will be only necessary to investigate under what circumstances the roots of the equation which determines the value of $\frac{dy}{dx}$ for the lines of curvature, are equal. In the present case this equation is

$$\frac{dy^2}{dx^2} - \left\{ \frac{y}{x} - e \frac{x}{y} + \frac{f}{xy} \right\} \cdot \frac{dy}{dx} - e = 0$$

The condition of the equality of the roots is

$$\left(\frac{y}{x} - e \frac{x}{y} + \frac{f}{xy} \right)^2 + 4e = 0 \text{ or } (y^2 - ex^2 + f)^2 + 4ex^2y^2 = 0$$

Since e is a quantity essentially positive, this condition can only be fulfilled by

$$\begin{aligned}xy &= 0 \\y^2 - ex^2 + f &= 0\end{aligned}$$

If $y = 0$ and therefore $x = \sqrt{\frac{f}{e}}$ these are the coordinates of the umbilical points already determined. If $x = 0 \therefore y = \sqrt{-f}$. Since f is positive, this value of y is imaginary. Hence there are but the four umbilical points already determined in the ellipsoid.

The delineation of the projection of the lines of curvature of the ellipsoid upon the plane of the greatest and mean axis is represented in Fig. 2.

To determine the projections of the lines of curvature upon the plane xz , let y be eliminated by the equations

$$\begin{aligned}a^2b^2z^2 + a^2c^2y^2 + b^2c^2x^2 &= a^2b^2c^2 \\a^2y^2 + b^2x^2 &= a^2b^2\end{aligned}$$

This elimination being effected, and b^2 eliminated by the equation

$$ea^2 - b^2 = f,$$

The result is

$$c^2(a^2 - a'^2)fx^2 + a^2b^2a'^2z^2 = ea^2c^2a'^2(a^2 - a'^2)$$

The process of elimination will be facilitated in this case by considering that

$$b^2 + f = a^2e.$$

The equation thus obtained is that of the projection of the lines

of curvature upon the plane xz . The quantity a'^2 is variable, and for each value of it there is a distinct line of curvature. Since it has been already proved that a'^2 can never exceed a^2 , it follows that $a^2 - a'^2 > 0$, and therefore that all these projections are ellipses. Let $a''c''$ be the semi-axes of any of them corresponding to any proposed value of a'^2 , \therefore

$$a''^2 = \frac{ea^2a'^2}{f}$$

$$c''^2 = \frac{ec^2(a^2 - a'^2)}{b^2}$$

Eliminating by these equations the variable quantity a'^2 , the result is

$$\begin{aligned} & fc^2a''^2 + a^2b^2c''^2 = ea^4c^2 \\ \text{or } & c^2(a^2 - b^2)a''^2 + a^2(b^2 - c^2)c''^2 = a^2c^2(a^2 - c^2) \end{aligned}$$

Considering $a''c''$ as variable coordinates this is the equation of an ellipse, since $a^2 - b^2 > 0$ and $b^2 - c^2 > 0$. This is the elliptic directrix for determining the projections of the lines of curvature upon the plane of the greatest and least axes of the ellipsoid.

This equation might have been derived at once from the equation (page 86) for the projections of the lines of curvature upon the plane xy by changing b into c and v into v . The result here however is somewhat different from the former. In the present case the lines of curvature are all projected into ellipses, and there is only an elliptic directrix to determine them. The projections of the lines of curvature are therefore all determined by the equations

$$\begin{aligned} a''^2z^2 + c''^2x^2 &= a''^2c''^2 \\ c^2(a^2 - b^2)a''^2 + a^2(b^2 - c^2)c''^2 &= a^2c^2(a^2 - c^2). \end{aligned}$$

Let a'' and c'' be the semiaxes of the elliptic directrix

$$a'' = a \frac{\sqrt{a^2 - c^2}}{\sqrt{a^2 - b^2}}$$

$$c'' = c \frac{\sqrt{a^2 - c^2}}{\sqrt{b^2 - c^2}}$$

Since $a^2 - c^2$ is greater than either $a^2 - b^2$ or $b^2 - c^2$ it follows that a'' and c'' are greater than a and c respectively. On the axes of x and z assume portions equal to a'' and c'' , and with these as axes let an ellipse be described. This ellipse will determine the several ellipses which are the projections of the lines of curvature in the same manner as the hyperbolic directrix determined the projections upon the plane of xy . The limits of these ellipses are those which ultimately coincide with the axes of the elliptic directrix. As c'' diminishes a'' approaches to equality with a'' , and the corresponding ellipse continually becomes more eccentric until it flattens into a right line when c'' vanishes. Similar observations apply to the other axis when a'' vanishes. It is obvious that all the ellipses which are projections of the lines of curvature are included within the elliptic directrix.

The elliptical section by the plane xz is itself one of the ellipses given by the equation; for if $a' = a$ $c'' = c$. Those ellipses in which $c'' < c$ divide the elliptic section into zones in the direction of the axis $2a$, and those in which $c'' > c$ divide into zones in the direction of the axis $2c$. These are therefore the projections of the lines of curvature perpendicular to the former.

If the inscribed lozenge be formed in the elliptic directrix by connecting the extremities of its axes, the four sides of this will be

tangents to all the ellipses which are projections of the lines of curvature. For let a'' be eliminated by the equations

$$\begin{aligned} a''^2 z^2 + c''^2 x^2 &= a''^2 c''^2 \\ fc^2 a''^2 + a^2 b^2 c''^2 &= ea^4 c^2 \end{aligned}$$

The result is

$$a^2 b^2 c''^4 + (fc^2 x^2 - a^2 b^2 z^2 - ea^4 c^2) c''^2 + ea^4 c^2 z^2 = 0$$

considering c'' variable, this equation represents all the ellipses which are projections of lines of curvature. To determine the equation of the lines which enclose the space occupied by these ellipses let this equation be differentiated, considering c'' as variable, the result of which is

$$2a^2 b^2 c''^3 + fc^2 x^2 - a^2 b^2 z^2 - ea^4 c^2 = 0$$

Eliminating c'' by this and the former,

$$4ea^6 b^2 c^2 z^2 - (fc^2 x^2 - a^2 b^2 z^2 - ea^4 c^2)^2 = 0$$

This can obviously be resolved into the factors

$$2\sqrt{e} a^3 b c z + fc^2 x^2 - a^2 b^2 z^2 - ea^4 c^2 = 0$$

$$2\sqrt{e} a^3 b c z - fc^2 x^2 + a^2 b^2 z^2 + ea^4 c^2 = 0$$

And these again may be resolved into the simple factors

$$\sqrt{f} \cdot cx + abz - \sqrt{e} \cdot a^2 c = 0$$

$$\sqrt{f} \cdot cx - abz + \sqrt{e} \cdot a^2 c = 0$$

$$\sqrt{f} \cdot cx + abz + \sqrt{e} \cdot a^2 c = 0$$

$$-\sqrt{f} \cdot cx + abz + \sqrt{e} \cdot a^2 c = 0$$

These are the equations of the sides of the inscribed lozenge in the directrix.

The section of the surface by xz being itself one of the lines of curvature, this lozenge circumscribes it like the others. The points of contact of the sides of the lozenge with it may be found by eliminating z by their equations. The result is

$$x = \pm \sqrt{\frac{f}{e}}$$

Hence the points of contact are the umbilical points of the ellipsoid.

The delineation of the projections of the lines of curvature of the ellipsoid on the plane of the greatest and least axes, is represented in Fig. 3.

PROP.

To determine the lines of curvature of the double surfaced hyperboloid.

The equation of this curve may be derived from that of the ellipse by changing the signs of a^2 and b^2 . It is therefore

$$a^2b^2z^2 - b^2c^2x^2 - a^2c^2y^2 = a^2b^2c^2$$

The quantities in the last proposition expressed by e and f become in this case

$$e = \frac{b^2(a^2 + c^2)}{a^2(b^2 + c^2)}$$

$$f = -\frac{b^2(a^2 - b^2)}{b^2 + c^2}$$

Since $a^2 > b^2$, f is essentially negative. The lines of curvature projected upon the plane xy are represented by the equation

$$a'^2 y^2 + b'^2 x^2 = a'^2 b'^2$$

where a'^2 and b'^2 are connected by the relation

$$ea'^2 - b'^2 = f$$

The semiaxes of the directrices are

$$A' = a \frac{\sqrt{a^2 - b^2}}{\sqrt{a^2 + c^2}}$$

$$B' = b \frac{\sqrt{a^2 - b^2}}{\sqrt{b^2 + c^2}}$$

The transverse axis of the hyperbolic directrix coincides in this case with the axis $2b$. The equation of the elliptic directrix being

$$A'^2 y^2 + B'^2 x^2 = A'^2 B'^2$$

and that of the hyperbolic

$$A'^2 y^2 - B'^2 x^2 = A'^2 B'^2$$

With these common axes let an ellipse and hyperbola be described upon the plane xy . As before with the coordinates of the points of the hyperbola as semiaxes ellipses being described, and with those of the points of the ellipse as semiaxes hyperbolas being described, these ellipses and hyperbolas are the projections of the lines of curvature upon the plane xy .

Let ca , cb , (Fig. 4) be the semiaxes of the directrices, and let any

point p be assumed upon the ellipse; and with its coordinates cm and cm' as semiaxes let an hyperbola be described, and a point p being assumed upon the hyperbolic directrix let an ellipse be described with the coordinates cm and cm . The ellipse and hyperbola thus described are the projections of lines of curvature, and in the same manner any number of such projections may be drawn.

As the point p recedes from the vertex of the hyperbolic directrix, the ellipses continually increase, and they diminish indefinitely as it approaches that point. When p coincides with b , one axis of the ellipse becomes equal to bb' , and the other vanishes, and the ellipse coincides with the right line bb' . This line being therefore the projection of one of the lines of curvature, the section of the surface by the plane yz must be that line.

As the point p passes through b , and proceeds in the elliptic arc bp , one axis continually diminishes, and the other increases. The projections also change their species and become hyperbolas. The transverse axis of the hyperbola continually diminishes as the point approaches a , and vanishes when p coincides with a . The hyperbola then extends itself into a straight line, and coincides with the axis aa' . This being the projection of the section of the surface by the plane xz , that line is one of the lines of curvature.

The points b, b' correspond to four umbilical points upon the hyperboloid. As in the ellipse the lines of curvature change their species in passing through these points, and their concavities are every where turned towards them.

The delineation of the projections of the lines of curvature of the double surfaced hyperboloid upon the plane of its imaginary axes is represented in Fig. 5.

PROP.

To determine the lines of curvature of the single-surfaced Hyperboloid.

The equation of the ellipsoid may be changed into that of this curve by making c^2 negative, by which it becomes

$$a^2b^2z^2 - a^2c^2y^2 - b^2c^2x^2 = -a^2b^2c^2$$

By this condition we have also

$$e = \frac{b^2(a^2 + c^2)}{a^2(b^2 + c^2)}$$

$$f = \frac{b^2(a^2 - b^2)}{b^2 + c^2}$$

The equation of the projection of the lines of curvature is the same as in the case of the ellipse, and the quantities $a^2 b^2$ subject to the same condition,

$$a'^2y^2 + b'^2x^2 = a'^2b'^2$$

$$ea'^2 - b'^2 = f.$$

The semiaxes of the directrices are in this case

$$A' = a \cdot \frac{\sqrt{a^2 - b^2}}{\sqrt{a^2 + c^2}}$$

$$B' = b \cdot \frac{\sqrt{a^2 - b^2}}{\sqrt{b^2 + c^2}}$$

Since $A' < a$ the vertices of the axis $2A'$ of the directrices must fall within those of the section of the surface by the plane xy .

Let $ca = A'$, $cb = B'$, (Fig. 6) and let the directrices be described with these lines as axes. Any point p in the elliptic directrix being assumed, and its coordinates drawn, with these, cm and cm' , let an hyperbola be described; this will be the projection of one of the lines of curvature. In like manner a point p in the hyperbolic directrix will determine an ellipse, which will also be a projection of a line of curvature. As the point p approaches b the transverse axis of the hyperbola diminishes and vanishes when p coincides with b . At this point the projection of the line of curvature is the axis bb' , and therefore the section of the surface by the plane yz is a line of curvature. When p coincides with a , or a' the hyperbola closing its branches, becomes a straight line and coincides with the axis aa' . So that the section of the surface by the plane xz is a line of curvature.

It may be observed generally, that those parts only of the ellipses hyperbolas and right lines thus determined, are actual projections of the lines of curvature, which fall outside the elliptical section of the surface by the plane xy ; for the value of z for every point within this elliptical section is impossible. Hence it follows that although at the points a , a' the projections of the lines of curvature change their species, and although all their concavities are turned towards this point, there is no corresponding umbilical point in the surface.

The delineation of the projections of the lines of curvature of the single-surfaced hyperboloid upon the plane of its real axes is represented in Fig. 7.

PROP.

To determine the lines of curvature of the elliptic Paraboloid.

The equation of this surface is

$$y^2 + mx^2 = pz$$

in which m is positive and > 1 . If $p > 0$, the surface lies on the positive side of the the origin, and if $p < 0$ on the negative side. As this is a mere variety in the position of the surface, and none in its species or properties, it is unnecessary to investigate more than one of the two cases. Let p be therefore assumed positive, and the surface consequently on the positive side of the origin.

The equations which determine the lines of curvature being

$$\begin{aligned} a'^2 y^2 + b'^2 x^2 &= a'^2 b'^2 \\ ea'^2 - b'^2 &= f \end{aligned}$$

in which

$$\begin{aligned} e &= m \\ f &= \frac{p^2}{4} \cdot \frac{m-1}{m} \end{aligned}$$

The quantities e and f are essentially positive, and the squares of the semiaxes of the directrices are

$$\begin{aligned} A'^2 &= \frac{p^2}{4} \cdot \frac{m-1}{m^2} \\ B'^2 &= \frac{p^2}{4} \cdot \frac{m-1}{m} \end{aligned}$$

Hence $A'^2 m = B'^2$ and therefore the elliptic directrix is similar to the sections of the surface by the planes perpendicular to the axis, for m is the ratio of the squares of the axes of each of these sections.

Let $ca = a'$, $cb = b'$ (Fig. 1.) and with these semiaxes let an ellipse and hyperbola be described. With the coordinates of each point of the ellipse as semiaxes let hyperbolas be described and with those of each point of the hyperbola let ellipses be described, these curves will be the projections of the lines of curvature as in the case of the ellipsoid. The extremities of the axis aa' of the direc-

trices are the projections of two umbilical points upon the plane xy . These points are therefore in the parabolic section of the surface by the plane xz . Since the values of x for these points are $\pm \frac{p}{2} \sqrt{\frac{m-1}{m}}$ and $y=0$, $\therefore z = \frac{p}{4} \cdot \frac{m-1}{m}$. Hence to find the umbilical points let a section of the paraboloid be made by a plane perpendicular to the axis at the distance $\frac{p}{4} \cdot \frac{m-1}{m}$ from the vertex; this section will be an ellipse, and the umbilical points will be at the extremities of its lesser axis.

The delineation of the projection of the lines of curvature of the elliptic paraboloid upon a plane perpendicular to its axis is similar to that of the ellipse, and is represented in Fig. 2.

PROP.

To determine the lines of Curvature of the Hyperbolic Paraboloid.

The equation of this surface is

$$y^2 - mx^2 = -pz$$

In this case, as before, m may be considered > 1 and $p > 0$.

$$e = -m$$

$$f = \frac{p^2}{4} \cdot \frac{m+1}{m}$$

The lines of curvature are to be determined by the equations

$$\begin{aligned} a'^2 y^2 + b'^2 x^2 &= a'^2 b'^2 \\ ma'^2 + b'^2 &= -\frac{p^2}{4} \cdot \frac{m+1}{m} \end{aligned}$$

To fulfil the last equation it is necessary that a'^2 and b'^2 should have different signs. In this case the directrices are therefore two conjugate hyperbolas, the squares of the semiaxes of which are

$$A'^2 = \frac{p^2}{4} \cdot \frac{m+1}{m^2}$$

$$B'^2 = \frac{p^2}{4} \cdot \frac{m+1}{m}$$

Since $A'^2 m = B'^2$ these hyperbolas are similar to the hyperbolic sections of the paraboloid perpendicular to the axis.

With A' and B' as semiaxes, let conjugate hyperbolas be described. Let $ca = A'$ (Fig 8.) and $cb = B'$. The coordinates of any point p in either hyperbola being drawn, let an hyperbola be described with these as semiaxes, the transverse semiaxis being that which coincides with the second axis of the directrix. This will be the projection of one of the lines of curvature. In like manner points assumed in the other hyperbola will determine another system of hyperbolas, which are the projections of the other system of lines of curvature. As the points p approach the vertices a and b , the hyperbolas approach the axes aa' and bb' extending themselves nearer to the axes of x and y , until the actual coincidence of the points p with a and b , when the hyperbolas actually become these lines. Which proves that the two sections of the surface by the planes xz and yz are lines of curvature.

The general delineation of the projection of the lines of curvature of the hyperbolic paraboloid upon a plane perpendicular to the axis is represented in Fig. 9.



The Section of an Ellipsoid by the Plane of the greatest and mean Axes with the Projections of the Lines of Curvature delineated.

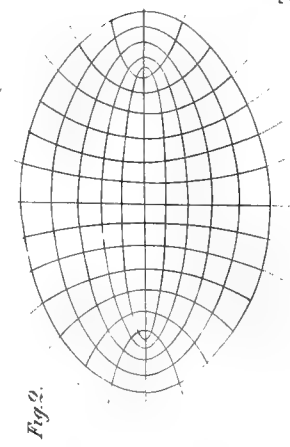


Fig. 2.

The Section of an Ellipsoid by the Plane of the greatest and least Axes with the Projections of the Lines of Curvature delineated.

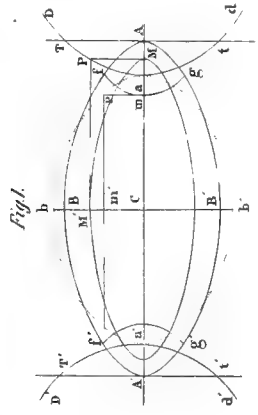


Fig. 1.

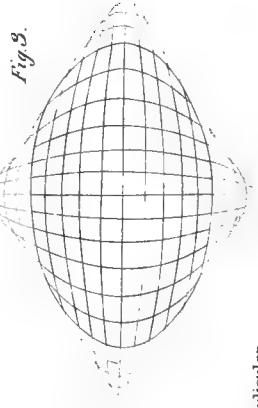


Fig. 3.

The Section of a double-surfaced Hyperboloid by a Plane perpendicular to its real Axis with the Projections of the Lines of Curvature delineated.

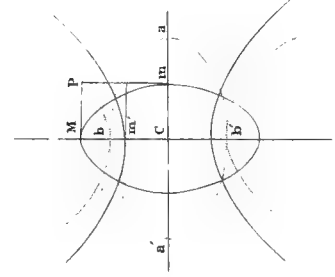


Fig. 4.

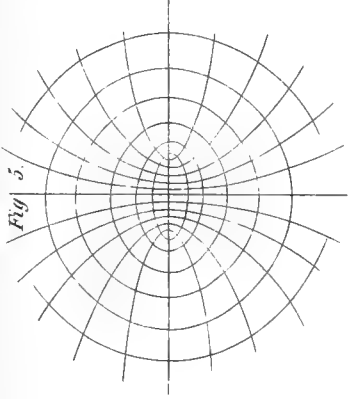


Fig. 5.

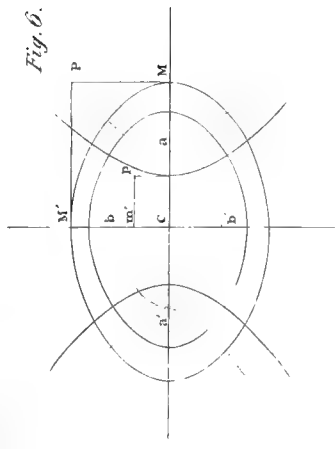


Fig. 6.

The Section of a single-surfaced Hyperboloid by the Plane of its real Axis with the Projections of the Lines of Curvature delineated.

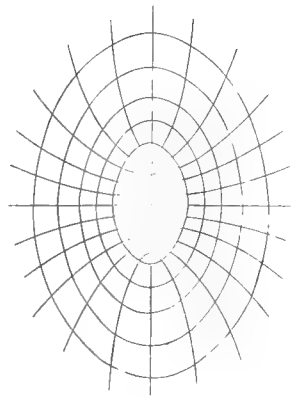


Fig. 7.

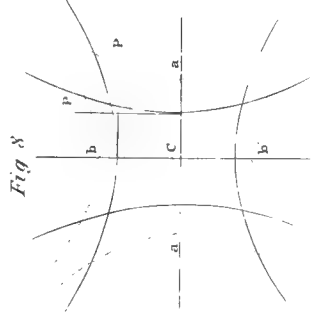


Fig. 8.

The Section of an Hyperbolic Paraboloid with the Projections of the Lines of Curvature delineated.

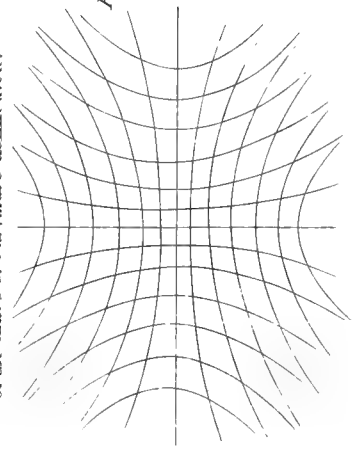


Fig. 9.



Catalogue of the Indigenous Plants of Ireland. By James Townsend Mackay, M. R. I. A. Associate of the Linnæan Society, &c. &c.

Read June 28, 1824.

THE object of the following Catalogue is to record, as far as has come to my knowledge, the names of the Phænogamous plants and ferns indigenous to Ireland, and the particular habits or places of growth of the more rare ones. In the year 1806, I gave to the Dublin Society a list, for publication, of some of the rarer and more useful plants of the country, principally found by me in two extensive tours into the southern and western counties; which, through the liberality of the Provost and Board of Trinity College, I was enabled to make in the two preceding years.

Doctor Wade had previously published a list of his discoveries; and, in the year 1810, a full list of the plants of the county of Cork, found by Mr. Drummond, was laid before the Royal Dublin Society, and published by them. With a view of publishing a Botanist's Guide through the counties of Dublin and Wicklow, which contain a very large proportion of the plants of Ireland, I have for several years noted the habitats of the plants found by me, as well as by

other botanical friends, whose names I have recorded with their discoveries. But, as no *Flora Hibernica* has yet appeared, it may perhaps be desirable to publish a general catalogue of the plants of the country, which may supply, in some degree, the place of such a work. The number of genera enumerated is 374, and of species 935: the corresponding British genera amount to 457, and the species to 1487. When some parts of the country, hitherto imperfectly explored, shall have been carefully examined, a considerable number of species may still be added to our *Flora*.

The arrangement I have followed is the Linnæan; and I have, for the most part, adopted the names as given in that popular and useful little work, "*Compendium Floræ Britannicæ*," by Smith, 2d. edition. In a few instances, I have adopted some judicious alterations made by Dr. Hooker in his "*Flora Scotica*." In the difficult genus *Saxifrage*, I have also followed the arrangement of Sir James E. Smith, in his admirable *English Flora*, two volumes of which have been lately published; and I have given some of his descriptions of my new Irish species and varieties;—in some cases however, with a few variations, together with some remarks and additional references. This I have done as several species and varieties, described in the above work, have not appeared before in any British *Flora*. Three varieties of *Saxifraga Geum* (one of which I am strongly inclined to consider a distinct species) are now for the first time described. A few plants, such as *Plantago Arenaria*, *Ammi Majus*, *Clypeola Jonthlaspi*, &c. which were found at Portmarnock sand-hills by me and some of my pupils, in several excursions made to that interesting spot, (and which have not as yet been assigned a place in any British *Flora*) I have referred to the respective foreign authors who describe them.

Although possessed of a rich supply of Cryptogamous plants, I shall at present only give the Ferns, reserving the consideration of the remaining orders for some future opportunity ; when I hope to give an account of them, either in a separate form, or embodied with the present in a descriptive Flora of the country.

BOOKS REFERRED TO.

Hook. Fl. Scot. Flora Scotica, by William Jackson. Hooker LL.D. London, 1821.

Sm. Compend. Compendium Floræ Britannicæ, by Sir James Edward Smith, 2d. edition. London, 1818.

E. B. English Botany, by Smith and Sowerby.

Br. Pr. Prodromus of the plants of New Holland, by Robert Brown, Esq.

Galp. Compend. Galpine's Compendium of British Botany. London, 1820.

D. Don. in Tr. L. Soc. Don's Arrangement of the Saxifagiæ, in Transactions of the Linnæan Society, vol. 13.

Haw, in Appen. Syn. Pl. Succulent. Haworth, in Appendix to his Synopsis of succulent plants. London, 1812.

Sm. E. Fl. English Flora, by Sir James Edward Smyth. London, 1824.

Lamarck et Decandolle Flora Gallica.

Persoon Syn. Plant. Persoon's Synopsis Plantarum. Paris, 1805, 1807.

I. MONANDRIA.

I. MONOGYNIA.

SALICORNIA.

- S. herbacea*, Hook. Fl. Scot. p. 1. E. B. t. 415 (*S. annua*) et t. 2475 (*S. procumbens*.)
 Hab. Salt marshes near the coast. Plentiful at Portmarnock, and near Ringsend.
S. radicans, Hook. Fl. Scot. p. 1. E. B. t. 1691 et 2467 (*S. fruticosa*.)
 Hab. Strand between Newry and Narrow-water.

HIPURIS.

- H. vulgaris*, Sm. Compend. p. 1. E. B. t. 763.
 Hab. Sides of ponds and in ditches. Plentiful in the Ponds in Mr. White's Demesne at Woodlands.

CHARA.

- C. vulgaris*, Sm. Compend. p. 1. E. B. t. 336.
 Hab. Ditches, ponds, &c.
C. hispida, Sm. Compend. p. 2. E. B. t. 463.
 Hab. In drains and pits in a bog near Balruddery; Dr. Scott.
C. flexilis, Sm. Compend. p. 2. E. B. t. 1070.
 Hab. In ditches and drains between Balruddery and Balbriggan; Dr. Scott.

ZOSTERA.

- Z. marina*, Sm. Compend. p. 2. E. B. t. 467.
 Hab. Marine ditches, and thrown up by the tide on the sea shore, common.

II. DIGYNIA.

CALLITRICHE.

- C. aquatica*, Sm. Compend. p. 2. E. B. t. 722.
 Hab. Ditches and stagnant waters.

II. DIANDRIA.

I. MONOGYNIA.

LIGUSTRUM.

- L. vulgare*, Sm. Compend. p. 3. E. B. t. 764.
Hab. Hedges.

FRAXINUS.

- F. excelsior*, Sm. Compend. p. 3. E. B. t. 1692.
Hab. Woods and hedges.

CIRCAEA.

- C. Lutetiana*, Sm. Compend. p. 3. E. B. t. 1056.
Hab. Woods.
C. Alpina, Sm. Compend. p. 3. E. B. t. 1057.
Hab. Cunnamara; Dr. Wade.

VERONICA.

- V. officinalis*, Sm. Compend. p. 4. E. B. t. 765.
Hab. Woods, pastures and dry ditch banks.
V. serpyllifolia, Sm. Compend. p. 4. E. B. t. 1075.
Hab. Pastures and road sides.
V. scutellata, Sm. Compend. p. 4. E. B. t. 782.
Hab. Bogs and sides of ditches. Plentiful on the Hill of Howth.
V. Anagallis, Sm. Compend. p. 4. E. B. t. 781.
Hab. Ditches and watery places.
V. Beccabunga, Sm. Compend. p. 4. E. B. t. 655.
Hab. Ditches and water-courses.
V. montana, Sm. Compend. p. 4. E. B. t. 766.
Hab. Shady woods. Plentiful in woodlands, &c.
V. chamædrys, Sm. Compend. p. 4. E. B. t. 623.
Hab. Woods, pastures and ditch banks.
V. agrestis, Sm. Compend. p. 4. E. B. t. 783.
Hab. Fields and waste places.
V. arvensis, Sm. Compend. p. 4. E. B. t. 734.
Hab. Fields, walls and gravelly places.
V. hederifolia Sm. Compend. p. 5. E. B. t. 784
Hab. Waste grounds, &c.
V. triphyllos, Sm. Compend. p. 5. E. B. t. 26.
Hab. Strand near Sandymount; Dr. Sott.

DIANDRIA.—MONOGYNIA.

PINGUICULA.

- P. Lusianica*, Sm. Compend. p. 5. E. B. t. 145
 Hab. Marshy grounds. Foot of Dublin mountains, &c.
P. vulgaris, Sm. Compend. p. 5. E. B. t. 70.
 Hab. Marshy grounds; frequent.
P. grandiflora, Sm. Compend. p. 5. E. B. t. 2184.
 Hab. Marshy ground, west side of the Lee above Iniscarrow, and about Macromp
 and Bantry; Mr. Drummond.

UTRICULARIA.

- U. vulgaris*, Sm. Compend. p. 5. E. B. t. 253.
 Hab. Ditches and drains. Plentiful in boggy places near the summit of Howth.
U. intermedia, Sm. Compend. p. 5. E. B. t. 2489.
 Hab. Peat drains near Scottsborough, county of Fermanagh; Dr. Scott. In bog
 holes at Muckruss, near Killarney.
U. minor, Sm. Compend. p. 5. E. B. t. 254.
 Hab. Bog holes in Cunnamara, &c.

LYCOPUS.

- L. Europæus*, Sm. Compend. p. 5. E. B. t. 1105.
 Hab. Ditches and river banks.

SALVIA.

- S. verbenaca*, Sm. Compend. p. 6. E. B. t. 154.
 Hab. Sandy banks, common.

LEMNA.

- L. trisulca*, Sm. Compend. p. 5. E. B. t. 926.
 Hab. In drains by the banks of the Boyne, a little below the bridge at Navan, and in
 bog holes and ditches, bog of Curragnugh, co. of Dublin.
L. minor, Sm. Compend. p. 5. E. B. t. 1095.
 Hab. Stagnant waters.
L. gibba, Sm. Compend. p. 5. E. B. t. 1233.
 Hab. Stagnant waters.

CLAUDIUM.

- C. mariscus*, Br. Pr. 236. E. B. t. 250 (*Schoenus mariscus*.)
 Hab. In small lakes in the county of Fermanagh; Dr. Scott. Common in small
 lakes throughout Cunnamara.

TRIANDRIA.—MONOGYNIA.

II. DIGYNIA.

ANTHOXANTHUM.

- A. odoratum*, Sm. Compend. p. 6. E. B. t. 647.
 Hab. Meadows and pastures.



III. TRIANDRIA.

MONOGYNIA.

VALERIANA.

- V. rubra*, Sm. Compend. p. 8. E. B. t. 1531.
 Hab. Old walls, generally near gardens.
V. officinalis, Sm. Compend. p. 8. E. B. t. 698.
 Hab. Ditches and marshy places.
V. locusta, Sm. Compend. p. 8. E. B. t. 811.
 Hab. On the south side of Killiney hill, by the way side, and in corn fields on the Sutton side of Howth.

IRIS.

- I. pseud-acorus*, Sm. Compend. p. 9. E. B. t. 578.
 Hab. Ditches and marshy places.
I. foetidissima, Sm. Compend. p. 9. E. B. t. 596.
 Hab. Field near Templeouge; Dr. Stokes—Ditch banks near Kilgobbin and woods at Templehill, near the Black Rock.

SCHÆNUS.

- S. albus*, Sm. Compend. p. 9. E. B. t. 985.
 Hab. Common in bogs near the upper lake of Killarney, and in Cunnamara, &c.
S. fuscus, Sm. Compend. p. 9. E. B. t. 1575.
 Hab. Found in a bog near the upper lake of Killarney in 1805, also in a wet bog near the of hill Cahill and elsewhere in Cunnamara in the same year.
S. nigricans, Sm. Compend. p. 9. E. B. t. 1121.
 Hab. Marshy places by the sea side, and wet sides of mountains. Plentiful at Portmarnock sands, and between Baldoyle and Howth, &c.
S. rufus, Sm. Compend. p. 9. E. B. t. 1010.
 Hab. Salt marshes between Baldoyle and Howth, plentiful.

TRIANDRIA.—DIGYNIA.

SCIRPUS.

- S. cæspitosus*, Sm. Compend. p. 9. E. B. t. 1029.
 Hab. Upland moory grounds. Plentiful on Howth.
S. pauciflorus, Sm. Compend. p. 10. E. B. t. 1122.
 Hab. Marshes on the hill of Howth, and foot of Dublin mountains.
S. palustris, Sm. Compend. p. 9. E. B. t. 131.
 Hab. Ditches and marshy places, frequent.
S. acicularis, Sm. Compend. p. 10. E. B. t. 749.
 Hab. Banks of Lough Erne; Dr. Scott.—On the banks of the Shannon near the wooden bridge at Portumna.
S. fluitans, Sm. Compend. p. 10. E. B. t. 216.
 Hab. In the large marsh near the summit of Howth. Frequent in stagnant pools and ditches in the southern and western parts of the country.
S. lacustris, Sm. Compend. p. 10. E. B. t. 666.
 β . *glaucus*, *S. glaucus*. E. B. t. 2321.
 Hab. Margins of lakes and ponds.— β . In a salt marsh between Clontarf and Kilbarrick Church.
S. setaceus, Sm. Compend. p. 10. E. B. t. 1693.
 Hab. Moist gravelly places, common.
S. maritimus, Sm. Compend. p. 10. E. B. t. 542.
 Hab. Salt marshes near the coast, as at Sandymount.
S. sylvaticus, Sm. Compend. p. 10. E. B. t. 919.
 Hab. Way side near Enniskillen, in moist ground near the lake; Rev. Dr. O'Beirne.

ERIOPHORUM.

- E. vaginatum*, Sm. Compend. p. 10. E. B. t. 873.
 Hab. Turf bogs, common.
E. angustifolium, Sm. Compend. p. 11. E. B. t. 564.
 Hab. Moors and turf bogs.
E. polystachyon, Sm. Compend. p. 11. E. B. t. 563.
 Hab. Bog holes on Feather-bed mountain, frequent.

NARDUS.

- N. stricta*, Sm. Compend. p. 11. E. B. t. 290.
 Hab. Moors and Heaths.

II. DIGYNIA.

PANICUM.

- P. sanguinale*, Sm. Compend. p. 12. E. B. t. 849.
 A. few specimens were found in the sand hills at Doagh, county of Clare;
 Dr. Wade.

TRIANDRIA—DIGYNIA.

ALOPECURIS.

- A. pratensis*, Sm. Compend. p. 12. E. B. t. 759.
 Hab. Meadows and pastures, common. One of the best early grasses.
A. geniculatus, Sm. Compend. p. 12. E. B. t. 1250, and t. 1467.
A. fulvus.
 Hab. Wet meadows and marshy places.

PHLEUM.

- P. pratense*, Sm. Compend. p. 12. E. B. t. 1076.
 Hab. Wet meadows and pastures. A good late grass.
P. Alpinum, Sm. Compend. p. 12. E. B. t. 519.
 Hab. Summit of Lettery mountain, Cunnamara; Dr. Wade.
P. arenarium, Sm. Compend. p. 12. E. B. t. 222.
 Hab. Sea shores, frequent at Sandymount and Portmarnock.

MILIUM.

- M. effusum*, Sm. Compend. p. 13. E. B. t. 1106.
 Hab. Woods. Plentiful at the Dargle and Waterfall, county of Wicklow.

AGROSTIS.

- A. canina*, Sm. Compend. p. 13. E. B. t. 1856.
 Hab. Moist heaths and moory places.
A. setacca, Sm. Compend. p. 13. E. B. t. 1188.
 Hab. Ballyphehane bog near Cork; Mr. Drummond.
A. vulgaris, Sm. Compend. p. 13. E. B. t. 1671.
 γ . Scarcely three inches high. *A. pumila*, Lightf.
 Hab. Meadows and pastures, common.
A. stolonifera, Sm. Compend. p. 13. E. B. t. 1532.
 Hab. Clayey and sandy banks on the sea shore, frequent. This, the famous Fiorin of Dr. Richardson, is considered by Dr. Hooker the same with *A. alba*. It however appears to me to be at least a distinct variety.
A. alba, Sm. Compend. p. 14. E. B. t. 1189.
 Hab. Ditch banks and moist meadows.

AIRA.

- A. cristata*, Sm. Compend. p. 14. E. B. t. 648.
 Hab. Dry mountainous pastures, frequent; also in sandy fields near the coast.—On Howth, and near Sandymount.
A. aquatica, Sm. Compend. p. 14. E. B. t. 1557.
 Hab. Ditches and watery places.—Watery lane near the College Botanic Garden.
A. caspitosa, Sm. Compend. p. 14. E. B. t. 1453.
 Hab. Bogs and wet uncultivated grounds, forming large tufts.

TRIANDRIA.—DIGYNIA.

- A. flexuosa*, Sm. Compend. p. 14. E. B. t. 1519.
 Hab. Heaths and hilly places.—On Howth, and the Scalp, &c.
A. caryophyllea, Sm. Compend. p. 14. E. B. t. 812.
 Hab. Gravelly hills and pastures, frequent.
A. præcox, Sm. Compend. p. 14. E. B. t. 1296.
 Hab. Dry upland pastures.

HOLCUS.

- H. avenaceus*, Sm. Compend. p. 14. E. B. t. 1813.
 Hab. Hedges and pastures, frequent.
H. mollis, Sm. Compend. p. 14. E. B. t. 1170.
 Hab. Hedge banks, and shady woods.
Hol. lanatus, Sm. Compend. p. 14. E. B. t. 1169.
 Hab. Meadows, pastures, and woods; common.

MELICA.

- M. uniflora*, Sm. Compend. p. 15. E. B. t. 1058.
 Hab. Woods, frequent. Plentiful in Woodlands, and at Powerscourt.
M. cærulea, Sm. Compend. p. 15. E. B. t. 1058.
 Hab. Wet heaths and boggy grounds. ♂ panicles white, found occasionally with the common variety in Kerry.

SESLERIA.

- S. cærulea*, Sm. Compend. p. 15. E. B. t. 1613.
 Hab. On Ben Bulben and other lime stone mountains near Sligo. One of the earliest grasses in flower.

POA.

- P. fluitans*, Sm. Compend. p. 15. E. B. t. 1520.
 Hab. Ditches and stagnant waters.
P. aquatica, Sm. Compend. p. 15. E. B. t. 1315.
 Hab. Sides of rivers and ditches.
P. maritima, Sm. Compend. p. 15. E. B. t. 1140.
 Hab. Salt marches near Ringsend, &c.
P. distans, Sm. Compend. p. 15. E. B. t. 986.
 Hab. Salt marshes.—At Howth and near Ringsend.
P. procumbens, Sm. Compend. p. 15. E. B. t. 532.
 Hab. Marsh below Cork; Mr. Drummond.
P. rigida, Sm. Compend. p. 15. E. B. t. 1371.
 Hab. Old walls, frequent.
P. compressa, Sm. Compend. p. 15. E. B. t. 365.
 Hab. On walls and dry banks between Galway and Tuam, and at Tullyallen, county of Lowth; Mr. John White.

TRIANDRIA.—DIGYNIA.

- P. alpina*, Sm. Compend. p. 15. E. B. t. 1003.
 Hab. On Brandon mountain near the summit.
P. trivialis, Sm. Compend. p. 16. E. B. t. 1672.
 Hab. Meadows and pastures, frequent.
P. pratensis, Sm. Compend. p. 16. E. B. t. 1073.
 β . minor, much smaller, *subglaucus*, panicles few flowered. E. B. t. 1004. *P. subcærulea*.
 Hab. In meadows, common. β . at Lough Bray.
P. annicia, Sm. Compend. p. 16. E. B. t. 1141.
 Hab. Meadows and pastures, and by road sides.
P. nemoralis, Sm. Compend. p. 16. E. B. t. 1265.
 Hab. Plentiful at Woodlands, and at the Dargle, &c.
P. decumbens, Sm. Compend. p. 16. E. B. t. 792.
 Hab. Dry mountainous pastures. Plentiful on Howth.

BRIZA.

- B. media*. Sm. Compend. p. 17. E. B. t. 340.
 Hab. Meadows and pastures.

DACTYLIS.

- D. glomerata*, Sm. Compend. p. 17. E. B. t. 335.
 Hab. Meadows and pastures, frequent. One of the best pasture and meadow grasses.

CYNOSURUS.

- C. cristatus*, Sm. Compend. p. 17. E. B. t. 316.
 Hab. Dry pastures, frequent. Found of late to be one of the best grasses for making ladies bonnets.

FESTUCA.

- F. ovina*, Sm. Compend. p. 17. E. B. t. 585 and 1917 (*F. cæsia*)
 β . *vivipara*, plant taller, leaves capillary. *F. vivipara*. E. B. t. 1355.
 Hab. Dry elevated pastures, as on Howth and the Dublin mountains.
 β . On Magilly-cuddy's reeks and other high mountains in Kerry.
F. duriuscula, Sm. Compend. p. 17. E. B. t. 470.
 β . root creeping. *F. glabra*. E. B. t. 2056.
 Hab. Pastures and waste grounds. β . By the sea side, frequent.
F. bromoides, Sm. Compend. p. 17. E. B. t. 1411.
 Hab. Dry pastures.—Plentiful on Howth, and near Dunleary.
F. myurits Sm. Compend. p. 17. E. B. t. 1412.
 Hab. Dry banks near Cork; Mr. Drummond.
F. uniglumis, Sm. Compend. p. 17. E. B. t. 1430.
 Hab. Portmarnock sands, May, 1824.

TRIANDRIA.—DIGYNIA.

- F. gigantea* Sm. Compend. p. 18. E. B. t. 1320.
 Hab. Shady woods.—In Woodlands, and at Leixlip Castle.
F. calamaria, Sm. Compend. p. 18. E. B. t. 1005.
 Hab. Dargle south side of the river.—Wooded banks at Powerscourt waterfall, and Mr. Tighe's woods at Woodstock, &c.
F. loliacea, Sm. Compend. p. 18. E. B. t. 1821.
 Hab. Moist meadows and pastures, occasionally.
F. pratensis, Sm. Compend. p. 18. E. B. t. 1592..
 Hab. Meadows and pastures, frequent.
F. elatior, Sm. Compend. p. 18. E. B. t. 1593.
 Hab. Moist meadows and banks.—On a moist bank by the sea, south side of Howth, abundant.

BROMUS.

- B. sylvaticus*, Sm. Compend. p. 19. E. B. t. 729.
 Hab. Woods and hedges, frequent.
B. secalinus, Sm. Compend. p. 19. E. B. t. 1171..
 Hab. On a dry bank near the junction of the Grand Canal with the Shannon. In sandy meadows between Clontarf and Howth, and other places; Mr. J. White.
B. mollis, Sm. Compend. p. 18. E. B. t. 1078.
 Hab. Meadows, banks, and corn fields, &c.
B. racemosus, Sm. Compend. p. 18. E. B. t. 920.
 Hab. Gravel pit in the Royal Dublin Society's Botanic Garden, and fields in its vicinity; Mr. Underwood.
B. arvensis, Sm. Compend. p. 19. E. B. t. 1984.
 Hab. Moist meadows near Sandymount.
B. erectus, Sm. Compend. p. 19. E. B. t. 471.
 Hab. Under hedges near Finglass; Dr. Scott.—Lands of Santry and Coolock, &c. Mr. J. White.
B. asper, Sm. Compend. p. 19. E. B. t. 1172.
 Hab. Moist woods in the county of Dublin, frequent.
B. sterilis, Sm. Compend. p. 19. E. B. t. 1030.
 Hab. Waste grounds, hedges and fields.

AVENA.

- A. fatua*, Sm. Compend. p. 19. E. B. t. 2221.
 Hab. Fields occasionally.
A. strigosa, Sm. Compend. p. 19. E. B. t. 1266.
 Hab. Corn fields near Cork; Mr. Drummond.
A. pubescens. Sm. Compend. p. 20. E. B. t. 1640.
 Hab. Dry pastures near Kingstown and elsewhere near Dublin.
A. pratensis, Sm. Compend. p. 20. E. B. t. 1204.
 Hab. Dry mountain pastures.

TRIANDRIA.—DIGYNIA.

- A. flavescens*, Sm. Compend. p. 20. E. B. t. 952.
Hab. Dry meadows and pastures.

ARUNDO.

- A. calamagrostis*, Sm. Compend. p. 20. E. B. t. 2159.
Hab. Banks of the Laggen; John Templeton, Esq.
A. arenaria, Sm. Compend. p. 20. E. B. t. 520.
Hab. Sandy sea shores, where it often proves useful in binding the sand by its strong creeping roots, so as to prevent the encroachment of the sea.
A. Phragmites, Sm. Compend. p. 20. E. B. t. 401.
Hab. Ditches and margins of lakes.

LOLIUM.

- L. pcrenne*, Sm. Compend. p. 20. E. B. t. 315.
Hab. Way sides and pastures.
L. arvense, Sm. Compend. p. 21. E. B. t. 1125.
Hab. Flax fields near Cork; Mr. Drummond. Potato and corn fields at Roche's-town and Glasnevin; Mr. J. White.
L. temulentum, Sm. Compend. p. 20. E. B. t. 1124.
Hab. Corn fields, occasionally. Mr Drummond finds a variety of it near Cork destitute of awns.

ROTBOLLIA.

- R. incurvata*, Sm. Compend. p. 21. E. B. t. 760.
Hab. Salt marshes. At Sandymount, near the lake and at Portmarnock, abundant.

ELYMUS.

- E. arenarius*, Sm. Compend. p. 21. E. B. t. 1672.
Hab. Sand bank at the western extremity of Bear, county of Cork; Mr. Drummond.

HORDEUM.

- H. murinum*, Sm. Compend. p. 21. E. B. t. 1971.
Hab. Walls and way sides.
H. pratense, Sm. Compend. p. 21. E. B. t. 409.
Hab. Fields between Baggot-street and the College Botanic Garden, &c.
H. maritimum, Sm. Compend. p. 21. E. B. t. 1205.
Hab. Sea coast. On sandy and gravelly banks along the shore between Swords and Rush; Mr. J. White.

TRITICUM.

- T. junceum*, Sm. Compend. p. 21. E. B. t. 814.
Hab. Sandy sea shores.

TETRANDRIA.—MONOGYNIA.

- T. repens*, Sm. Compend. p. 21. E. B. t. 909.
 Hab. Fields and waste places.
T. caninum, Sm. Compend. p. 21. E. B. t. 1837. (*Elymus caninus*.)
 Hab. Woods and hedges. Plentiful at Woodlands.
T. lolaccum, Sm. Compend. p. 22. E. B. t. 221.
 Hab. Sea coast.—At Sandymount and Howth, &c.

III. TRIGYNIA.

MONTIA.

- M. fontana*, Sm. Compend. p. 22. E. B. t. 1206.
 Hab. In rills and springs and wet places, frequent.

IV. TETRANDRIA.

I. MONOGYNIA.

DIPSACUS.

- D. sylvestris*, Sm. Compend. p. 23. E. B. t. 1032.
 Hab. Borders of fields and waysides.

SCABIOSA.

- S. succisa*, Sm. Compend. p. 24. E. B. t. 878.
 Hab. Meadows and pastures.
S. arvensis, Sm. Compend. p. 24. E. B. t. 659.
 Hab. Corn fields, frequent.

SHERARDIA.

- S. arvensis*, Sm. Compend. p. 24. E. B. t. 891.
 Hab. Corn fields and dry banks, not unfrequent

ASPERULA.

- A. odorata*, Sm. Compend. p. 24. E. B. t. 755.
 Hab. Woods and shady places. Plentiful at the Dargle.

TETRANDRIA.—MONOGYNIA.

GALIUM.

- G. verum*, Sm. Compend. p. 25. E. B. t. 660.
 Hab. Dry banks, frequent.
G. palustre, Sm. Compend. p. 24. E. B. t. 1857.
 Hab. Marshes and sides of lakes, frequent.
G. uliginosum, Sm. Compend. p. 24. E. B. t. 1972.
 Hab. In a marsh near O'Reilly's nursery, Delgany; Mr. Underwood.
G. saxatile, Sm. Compend. p. 24. E. B. t. 815.
 Hab. Hilly and heathy places, most abundant.
G. pusillum, Sm. Compend. p. 25. E. B. t. 74.
 Hab. Limestone rocks at Muckruss, and near Corrofin, and at Rock-Forest, county of Clare,
G. Mollugo, Sm. Compend. p. 25. E. B. t. 1673.
 Hab. Sandy fields. At Sandymount near the Mortella tower.
G. boreale, Sm. Compend. p. 25. E. B. t. 105.
 Hab. Mangerton mountains, county of Kerry, and mountains in Cunnamara.
G. Aparine, Sm. Compend. p. 25. E. B. t. 816.
 Hab. Hedges, common.

RUBIA.

- R. peregrina*, Sm. Compend. p. 25. E. B. t. 851.
 Hab. Rocks on Howth and at Killiney hill; also on limestone rocks at Muckruss, Killarney.

EXACUM.

- E. filiforme*, Sm. Compend. p. 25. E. B. t. 235.
 Hab. Marshy ground near Bantry; Miss Hutchins and Mr. Drummond.

PLANTAGO.

- P. major*. Sm. Compend. p. 26. E. B. t. 1558.
 Hab. Pastures and road sides, frequent.
P. media, Sm. Compend. p. 26. E. B. t. 1559.
 Hab. Near Skerries; Mr. Underwood.
P. lanccolata, Sm. Compend. p. 26. E. B. t. 507.
 Hab. Meadows and pastures.
P. coronopus, Sm. Compend. p. 26. E. B. t. 892.
 Hab. Gravelly and sandy sea shores, frequent.
P. arenaria, Lamarck et De candolle Fl. Gallica, p. 201.
 Hab. Found in a sandy field at Portmarnock in July 1820, by Henry Darley, Esq. when on a Botanic excursion with me and several other gentlemen. This plant, though indigenous to France, had not before been found in a wild state in Britain or Ireland; nor had it been previously cultivated in either of the Dublin Botanic Gardens.

TETRANDRIA.—TETRAGYNIA.

CENTUNCULUS.

C. minimus, Sm. Compend. p. 26. E. B. t. 531.

Hab. Marshes at Glengariff, and Ballylickey near Bantry.

CORNUS.

C. sanguinea, Sm. Compend. p. 26. E. B. t. 249.

Hab. South Islands of Arran.

PARIETARIA.

P. officinalis, Sm. Compend. p. 26. E. B. t. 879.

Hab. Dry waste grounds, and walls; frequent.

ALCHEMILLA.

A. vulgaris, Sm. Compend. p. 26. E. B. t. 597.

Hab. Dry pastures and woods, abundant. The variety with pubescent leaves grows on Mam Turk and other mountains in Cunnamara.

A. alpina, Sm. Compend. p. 27. E. B. t. 244.

Hab. Cliffs on Brandon mountain near Dingle, 1804.

A. arvensis. Sm. Compend. p. 27. E. B. t. 1011.

Hab. Fields and uncultivated grounds, frequent.

IV. TETRAGYNIA.

ILEX.

I. aquifolium, Sm. Compend. p. 27. E. B. t. 496.

Hab. Woods. In Dunganstown woods; Mr. Hodgins, who has found several new varieties of it.

POTAMOGETON.

P. natans, Sm. Compend. p. 27. E. B. t. 1822.

Hab. Lakes and still waters.

P. heterophyllum, Sm. Compend. p. 27. E. B. t. 1285.

Hab. River Lee above the bason, and at Sunday's Well; Mr. Drummond.

P. Lucens, Sm. Compend. p. 27. E. B. t. 376.

Hab. In the River Lee above the Weirs, and at Sunday's Well; Mr Drummond.

P. crispum, Sm. Compend. p. 28. E. B. t. 1012.

Hab. Ditches and ponds, common.

P. compressum. Sm. Compend. p. 28. E. B. t. 418.

Hab. Ditches and stagnant waters. In Ballypnehane bog; Mr. Drummond.

PENTANDRIA.—MONOGYNIA.

- P. pusillum*, Sm. Compend. p. 28. E. B. t. 215.
 Hab. Ditches and stagnant waters. Ballyphehane bog near the Cork Botanic Garden; Mr. Drummond. In the Crand Canal above the first Lock.
P. pectinatum, Sm. Compend. p. 28. E. B. t. 323.
 Hab. Ditches near Sandymount.

RUPPIA.

- R. maritima*, Sm. Compend. p. 28. E. B. t. 136.
 Hab. Stagnant waters by the sea side. In the salt marshes by the North Wall; Dr. Scott.

SAGINA.

- S. procumbens*, Sm. Compend. p. 28. E. B. t. 880.
 Hab. Sandy and gravelly soils, frequent.
S. apetala, Sm. Compend. p. 28. E. B. t. 881.
 Hab. Dry gravelly places, not unfrequent.
S. maritima, Sm. Compend. p. 28. E. B. t. 2195.
 Hab. Sea coast. On the beach near Narrow-water, 1807. Plentiful in salt marshes near Ringsend.

RADIOLA.

- R. millegrana*, Sm. Compend. p. 28. E. B. t. 893.
 Hab. Glangariff; Mr. Drummond. Marshy grounds near Brandon.

 V. PENTANDRIA

I. MONOGYNIA.

MYOSOTIS.

- M. palustris*, Sm. Compend. p. 33. E. B. t. 1973.
 Hab. Ditches and sides of rivers.
M. arvensis, Sm. Compend. p. 33. E. B. t. 2558.
 Hab. Fields and waste places.
M. versicolor, Sm. Compend. p. 33. E. B. t. 480.
 Hab. Dry sandy fields near Kilbarrick church.

PENTANDRIA.—MONOGYNIA.

LITHOSPERMUM.

- L. officinale*, Sm. Compend p. 34. E. B. t. 134.
 Hab. Waste uncultivated grounds. Foot of Killiney hill, and banks of the Dodder near Milltown.
L. arvense, Sm. Compend. p. 34. E. B. t. 123.
 Hab. Corn fields, not uncommon.

PULMONARIA.

- P. maritima*, Sm. Compend. p. 34. E. B. t. 368. *Lithospermum maritimum*, Sm. E. Fl. vol. 1, p. 256.
 Hab. Sea shore between Portran and Skerries.

ANCHUSA.

- A. sempervirens*, Sm. Compend. p. 34. E. B. t. 45.
 Hab. Hedges near Douglass, county of Cork; Mr. Drummond.

CYNOGLOSSUM.

- C. officinale*, Sm. Compend. p. 34. E. B. t. 921.
 Hab. Waste places, frequent. A variety with white flowers found occasionally with the common variety on the sandy common opposite to Malahide.
C. sylvaticum, Sm. Compend. p. 34. E. B. t. 1642.
 Hab. Near Balbriggen, or at Hampton; Dr. Scott.

SYMPHYTUM.

- S. officinale*, Sm. Compend. p. 34. E. B. t. 817.
 Hab. Moist meadows. Kelly's Glen near the lower end.

BORAGO.

- B. officinalis*, Sm. Compend. p. 34. E. B. t. 36.
 Hab. Old Abbey of Timoligne, county of Cork; Mr. Drummond.

LYCOPSIS.

- L. arvensis*, Sm. Compend. p. 35. E. B. t. 938.
 Hab. Sandy fields near Kilbarrick church, and about Beldoyle, &c.

ECHIUM.

- E. vulgare*, Sm. Compend. p. 35. E. B. t. 181.
 Hab. Fields near Bantry; Mr. Drummond. Near Mansfield's-town, county of Lowth; Mr. P. Kearns.

PENTANDRIA.—MONOGYNIA.

PRIMULA.

- P. vulgaris*, Sm. Compend. p. 35. E. B. t. 4.
 Hab. Woods, hedge banks, and pastures.
P. elatior, Sm. Compend. p. 35. E. B. t. 513.
 Hab. Fields north of Dublin.
P. veris, Sm. Compend. p. 35. E. B. t. 5.
 Hab. Woods and pastures, frequent.

MENYANTHES.

- M. trifoliata*, Sm. Compend. p. 35. E. B. t. 495.
 Hab. Marshy places, in pools of water, abundant.

HOTTONIA.

- H. palustris*, Sm. Compend. p. 35. E. B. t. 364.
 Hab. In drains near Downpatrick; Dr. Kennedy.

LYSIMACHIA.

- L. vulgaris*, Sm. Compend. p. 36. E. B. t. 761.
 Hab. Ballyphehane bog, and Summerstown bog near Cork; Mr. Drummond. Bilberry Island, Lough Corrib, and near the bridge of Ballinasloe; Dr. Wade. On the banks of Fergus near the bridge at Clare; and opposite Muckruss gate, Killarney.
L. nemorum, Sm. Compend. p. 36. E. B. t. 527.
 Hab. Woods and shady places, frequent.
L. Nummularia, Sm. Compend. p. 36. E. B. t. 528.
 Hab. Summerstown bog near Cork; Dr. Wood.

ANAGALLIS.

- A. arvensis*, Sm. Compend. p. 36. E. B. t. 529.
 Hab. Corn fields, abundant.
A. cærulea, Sm. Compend. p. 36. E. B. t. 1823.
 Hab. Corn fields near Warren-point; Mrs. Lyne, who pointed it out to me there in 1808.
A. tenella, Sm. Compend. p. 36. E. B. t. 530.
 Hab. Bogs and wet sandy places, not uncommon.

CONVOLVULUS.

- C. arvensis*, Sm. Compend. p. 36. E. B. t. 312.
 Hab. Ditch banks and corn fields, frequent.

PENTANDRIA.—MONOGYNIA.

- C. sepium*, Sm. Compend. p. 36. E. B. t. 313.
 Hab. Hedges. Hedge between the Rock road and College Botanic Garden.
C. Soldonella, Sm. Compend. p. 36. E. B. t. 314.
 Hab. Sea shores, in sandy places, frequent. In the sand hills at Portmarnock, &c.

POLEMONIUM.

- P. cæruleum*, Sm. Compend. p. 36. E. B. t. 14.
 Hab. Knockmaroon hill, near the Strawberry banks.

CAMPANULA.

- C. rotundifolia*, Sm. Compend. p. 37. E. B. t. 866.
 Hab. Dry hilly pastures, and sandy grounds near the coast.
C. latifolia, Sm. Compend. p. 37. E. B. t. 302.
 Hab. Woods near the Barrow above New-Ross.
C. hederacea, Sm. Compend. p. 37. E. B. t. 73.
 Hab. Moist boggy grounds. Plentiful near Bandon and other parts of the county of Cork. On Sugar-loaf mountain; Dr. Stokes, and John Nuttall, Esq.
 Abundant in Glencree, near the Copse wood.

JASIONE.

- J. montana*, Sm. Compend. p. 37. E. B. t. 882.
 Hab. Dry hilly pastures, common.

LOBELIA.

- L. Dortmanna*, Sm. Compend. p. 37. E. B. t. 140.
 Hab. Margins of lakes. Lake at the Seven Churches. Lake at the foot of Mourne mountains, and in all the lakes near Killarney.

VIOLA.

- V. hirta*, Sm. Compend. p. 38. E. B. t. 894.
 Hab. Sandy fields and banks. At Portmarnock sands abundantly.
V. odorata, Sm. Compend. p. 38. E. B. t. 619.
 Hab. In hedges between Killiney hill and Bray.
V. palustris, Sm. Compend. p. 38. E. B. t. 444.
 Hab. Bogs and marshy grounds. Plentiful in Glencree, and near Powerscourt waterfall.
V. canina, Sm. Compend. p. 38. E. B. t. 620.
 Hab. Woods, banks, and pastures, frequent.
V. lactea, Sm. Compend. p. 38. E. B. t. 445.
 Hab. Brandon mountain; Dr. Taylor.
V. tricolor, Sm. Compend. p. 38. E. B. t. 1287.
 Hab. Sandy corn fields, common.

VERBASCUM.

- V. Thapsus*, Sm. Comend. p. 38. E. B. t. 549.
 Hab. Waste places.

PENTANDRIA.—MONOGYNIA.

V. virgatum, Sm. Compend. p. 38. E. B. t. 550.

Hab. On the College grounds at West Green-lane near Kenmare, where it had been previously observed by Dr. George Clarke, in 1804.

HYOSYAMUS.

H. niger, Sm. Compend. p. 38. E. B. t. 591.

Hab. Sandy grounds by the sea side. Sandhills opposite to Lord Howth's gate, near Beldoyle, and Strand at Sandymount near the Martello Tower.

ATROPA.

A. Belladonna, Sm. Compend. p. 39. E. B. t. 592.

Hab. At Stradbally by the brook, near the old Monastery; Dr. Wade.

SOLANUM.

S. Dulcamara, Sm. Compend. p. 39. E. B. t. 565.

Hab. Hedges in rather moist ground. Hedges by the Watery lane, near the College Botanic Garden.

S. nigrum, Sm. Compend. p. 39. E. B. t. 566.

Hab. Waste places near towns and villages. On an old dung-hill near Richmond.

ERYTHREÆ.

E. Centaurium, Sm. E. Fl. Vol. 1. p. 320. Sm. Compend. p. 39. E. B. t. 417.
Chironia Centaurium.

Hab. Sandy pastures, frequent.

E. littoralis, Sm. E. Fl. Vol. 1. p. 320. Sm. Compend. p. 39. E. B. t. 2305.
Chironia littoralis.

Hab. Portmarnock sands, along with the last.

E. pulchella, Sm. E. Fl. Vol. 1. p. 322. Sm. Compend. p. 39. E. B. t. 458.
Chironia pulchella.

Hab. Cape Clear Island. Mr Drummond.

SAMOLUS.

S. Valerandi, Sm. Compend. p. 39. E. B. t. 703.

Hab. Salt marshes near Sandymount, Ringsend, &c.

LONICERA.

L. Periclymenum, Sm. Compend. p. 39. E. B. t. 800.

Hab. Woods and hedges, common. β . Oak leaved variety, on Killiney hill among loose stones.

RHAMNUS.

R. catharticus, Sm. Compend. p. 40. E. B. t. 1629.

Hab. On a limestone rock east side of the Lee, two miles above Cork; Mr. Drummond. Islands in Lough Erne near Enniskillen, &c.

PENTANDRIA.—DIGYNIA.

EUONYMUS.

- E. europæus*, Sm. Compend. p. 40. E. B. t. 362.
 Hab. Plentiful in the county of Cork; Mr. Drummond. Limestone rocks near Galway, and Dargle woods.

RIBES.

- R. rubrum* Sm. Compend. p. 40. E. B. t. 1289.
 Hab. In a naturalized state in different parts of the county of Cork; Mr. Drummond.
R. nigrum, Sm. Compend. p. 40. E. B. t. 1291.
 Hab. In the county of Cork, perfectly naturalized; Mr. Drummond. Bogs in the county of Limerick near Castle-connel.
R. Grossularia, Sm. Compend. p. 40. E. B. t. 1292.
 Hab. County of Cork in a naturalized state; Mr. Drummond.

HEDERA.

- H. Helix*, Sm. Compend. p. 40. E. B. t. 1267.
 Hab. Rocks, trunks of trees, and old ruins.

GLAUX.

- G. maritima*, Sm. Compend. p. 41. E. B. t. 13.
 Hab. Sea shores in muddy places.

VINCA.

- V. minor*, Sm. Compend. p. 41. E. B. t. 917.
 Hab. Woods at Castle-hyde near Cork; Mr. Drummond.
V. major, Sm. Compend. p. 41. E. B. t. 514.
 Hab. In hedges and woods, and in old church yards, not unfrequent.

II. DIGYNIA.

CHENOPODIUM.

- C. Bonus Henricus*, Sm. Compend. p. 41. E. B. t. 1033.
 Hab. Waysides, frequent.
C. rubrum. Sm. Compend. p. 41. E. B. t. 1721.
 Hab. By the side of the foot-way between Bagot-strect and the College Botanic Garden.

PENTANDRIA.—DIGYNIA.

- C. murale*, Sm. Compend. p. 41. E. B. t. 1722.
 Hab. Under walls in waste places. In waste ground behind the old Anatomy-house, Trinity College.
C. album, Sm. Compend. p. 42. E. B. t. 1723.
 Hab. Waste places and dung-hills, common.
C. olidum, Sm. Compend. p. 42. E. B. t. 1034.
 Hab. Found sparingly near Sandymount, and between the Custom-house and Annesly-bridge several years ago. Not found lately.
C. maritimum, Sm. Compend. p. 42. E. B. t. 633.
 Hab. Sea coast in muddy places. Plentiful at Portmarnock and near Beldoyle.

BETA.

- B. maritima*, Sm. Compend. p. 42. E. B. t. 285.
 Hab. Sea shores in muddy places, and on banks on decaying rock, as at Howth on the Sutton side. A good substitute for spinage in the winter and spring, and often cultivated in gardens near Cork and elsewhere on that account.

SALSOLA.

- S. Kali*, Sm. Compend. p. 42. E. B. t. 634.
 Hab. Sandy sea shores, frequent.

ULMUS.

- U. campestris*, Sm. Compend. p. 42. E. B. t. 1886.
 Hab. Hedges and woods.
U. montana, Sm. Compend. p. 42. E. B. t. 1887.
 Hab. Hedges and woods, in the county of Wicklow.

CUSCUTA.

- C. europæa*, Sm. Compend. p. 43. E. B. t. 378.
 Hab. Parasitical on Flax.

GENTIANA.

- Gentiana verna*, Sm. Compend. p. 43. E. B. t. 493.
 Hab. In the crevices of limestone rocks in the Barony of Burren, and near Galway, plentiful.
G. Amarilla, Sm. Compend. p. 43. E. B. t. 236.
 Hab. Plentiful on the limestone tract between Gort and Corrofin, county of Clare; and in the Island of Bartra and other places near Killala. Sparingly in the Phoenix-park near the west gate.
G. campestris, Sm. Compend. p. 43. E. B. t. 237.
 Hab. On the hill of Howth near the old Light-house. On a limestone soil near Oughterard, county of Galway; and in fields near Westport.

PENTANDRIA.—DIGYNIA.

ERYNGIUM.

E. maritimum, Sm. Compend. p. 44. E. B. t. 718.

Hab. Sea coast, in sandy places, frequent.

E. campestre, Sm. Compend. p. 44. E. B. t. 57.

Hab. In a sandy field near Lismore, county of Waterford; Mr. Drummond.

HYDROCOTYLE.

H. vulgaris, Sm. Compend. p. 44. E. B. t. 751.

Hab. Bogs and banks of lakes, frequent.

SANICULA.

S. europæa, Sm. Compend. p. 44. E. B. t. 98.

Hab. Woods, very abundant.

CAUCALIS.

C. Anthriscus, Sm. Compend. p. 45. E. B. t. 987.

Hab. Hedges and waste places.

C. nodosa, Sm. Compend. p. 45. E. B. t. 199.

Hab. Waste places and by road sides.

DAUCUS.

D. Carrota, Sm. Compend. p. 45. E. B. t. 1174.

Hab. Pastures and borders of fields.

D. maritima, Sm. Compend. p. 45. E. B. t. 2560.

Hab. Sandy fields near Beldoyle and Portmarnock sands, abundantly. Scarcely distinct from *Daucus Carrota*.

AMMI.

Involucra pinnatifid; Calyx entire; petals inflexo-cordate, equal in the disk, unequal in the margin; fruit small, somewhat round, smooth, and striated.

A. majus, Lamarck et Decandolle Flora Gallica p. 511. Per. syn. Pl. p. 308.

Lower leaves pinnate, leaflets lanceolate. Upper leaves many parted.

This beautiful umbelliferous plant was found by Mr. E. Murphy and myself in the sands of Portmarnock in September 1821, and I have since found it sparingly in the same place. Although a native of sandy fields in France, it had not before been observed in Britain or Ireland.

BUNIUM.

B. Bulbocastanum, Sm. Compend. p. 44. E. B. t. 988.

Hab. Sandy pastures, and dry banks, frequent.

PETANDRIA.—DIGYNIA.

CONIUM.

- C. maculatum*, Sm. Compend. p. 45. E. B. t. 1191.
Hab. Waste places, bauks, &c. frequent.

PEUCEDANUM.

- P. Silaus*, Sm. Compend. p. 46. E. B. t. 2142.
Hab. Shore near Belfast; John Templeton, Esq.

CRITHMUM.

- C. maritimum*, Sm. Compend. p. 46. E. B. t. 819.
Hab. Rocks by the sea side. Plentiful on Howth, south side.

HERACLEUM.

- H. Sphondylium*, Sm. Compend. p. 46. E. B. t. . 939.
Hab. Fields, common.

ANGELICA.

- A. sylvestris*, Sm. Compend. p. 46. E. B. t. 1128.
Hab. Moist woods and marshy places, frequent.

SIUM.

- S. latifolium*, Sm. Compend. p. 46. E. B. t. 204.
Hab. Bog of Curragha; Mr. Underwood. By the banks of the river Shannon near Limerick.
S. angustifolium, Sm. Compend. p. 46. E. B. t. 139.
Hab. In ditches by the banks of the Shannon near Limerick. In the county of Fermanagh; Dr. Scott.
S. nodiflorum, Sm. Compend. p. 46. E. B. t. 639.
Hab. Ditches and sides of rivulets, common.
S. repens, Sm. Compend. p. 46. E. B. t. 1431.
Hab. In a marsh by the river Fergus a little above the bridge of Ennis, and in a marsh East end of the hill of Howth.
S. verticillatum, Sm. Compend. p. 46. E. B. t. 395.
Hab. In a marsh near Lane Bridge and other places in Kerry. In marshes at Cranmore near Belfast; Mr. Templeton.

SISON.

- S. inundatum*, Hook. Fl. Scot. p. 91. Sm. Compend. p. 44. et. E. B. t. 277.
(*Hydrocotyle inundata*) Marsh near the summit of Howth, abundantly.

PENTANDRIA.—DIGYNIA.

CENANTHE.

- C. fistulosa*, Sm. Compend. p. 47. E. B. t. 363.
 Hab. Ditches and marshes.
- C. peucedanifolia*, Sm. Compend. p. 47. E. B. t. 348.
 Hab. Salt marshes. West side of Lambay; Mr. Underwood. Near Beldoye and at Portmarnock strand, and by the lake near Sandymount.
- C. crocata*, Sm. Compend. p. 47. E. B. t. 2313.
 Hab. Banks of ditches, rivulets, and lakes, frequent.

PHELANDRUM.

- P. aquaticum*, Sm. Compend. p. 47. E. B. t. 684.
 Hab. By the verge of the large pond at Woodlands; Mr. Underwood. Banks of Lough Erne; Dr Scott. In ditches by the side of the road between Shannon Harbour and Banagher.

CICUTA.

- C. virosa*, Sm. Compend. p. 47. E. B. t. 479.
 Hab. Sides of lakes, &c. Plentiful in drains on the banks of Lough Erne; Dr. Scott.

ÆTHUSA.

- Æ. Cynapium*, Sm. Compend. p. 47. E. B. t. 1192.
 Hab. Fields and cultivated grounds, common.

SCANDIX.

- S. Pecten-Veneris*, Sm. Compend. p. 47. E. B. t. 1397.
 Hab. Corn fields, common.

ANTHRISCUS.

- A. vulgaris*, Pers. Syn. pl. v. 1. p. 820. E. B. t. 818, and Sm. Compend. p. 48. Scandix Anthriscus.
 Hab. Waste grounds and way sides, common.

CHÆROPHYLLUM.

- C. sylvestre*, Sm. Compend. p. 48. E. B. t. 752.
 Hab. Under hedges and borders of fields, abundant.
- C. temulentum*, Sm. Compend. p. 48. E. B. t. 1521.
 Hab. Hedges and fields. In fields between Glasnevin and Finglas.

PENTANDRIA.—TRIGYNIA.

PASTINACA.

P. sativa, Sm. Compend. p. 48. E. B. t. 556.

Hab. Fields at Beldrummond near the Man of War.

SMYRNĪUM.

S. Olusatrum, Sm. Compend. p. 48. E. B. t. 230.

Hab. Under hedges and ditch banks near Dublin, abundant.

ANETHUM.

A. Feniculum, Sm. Compend. p. 48. E. B. t. 1208.

Hab. Dry gravelly banks. Bank of the Dodder near Clonskeagh, and dry banks near Chapelizod.

CARUM.

C. Carui. Sm. Compend. p. 48. E. B. t. 1503.

Hab. Fields near Kilmainham.

PIMPINELLA.

P. Saxifraga, Sm. Compend. p. 48. E. B. t. 407.

Hab. Dry pastures and banks, common.

P. magna. Sm. Compend. p. 48. E. B. t. 408.

Hab. Limestone grounds about Cork, abundant; Mr. Drummond. Muckruss woods near the Abbey.

APIUM.

A. graveolens, Sm. Compend. p. 49. E. B. t. 1210.

Hab. Salt marshes, common.

A. petroselinum Hull's, Br. Fl. p. 309.

Hab. Old Castles in the county of Cork, frequent; Mr. Drummond.

EGOPODIUM.

Æ. Podograria, Sm. Compend. p. 49. E. B. t. 940.

Hab. Plentiful in Mr. Gregory's Demesne, Phœnix-park. Not very common near Dublin. Often a troublesome weed in Gardens.

III. TRIGYNIA.

VIBURNUM.

V. Opulus, Sm. Compend. p. 49. E. B. t. 332.

Hab. Moist woods and hedges. In hedges near Dundrum, and in Powerscourt woods.

PENTANDRIA.—TETRAGYNIA.—PENTAGYNIA.

SAMBUCUS.

- S. Ebulus*, Sm. Compend. p. 49. E. B. t. 475.
 Hab. Lambay; Dr. Wade. In Powerscourt Demesne, just before you enter the Deer-park, and in a Church-yard below Kenmare.
S. nigra. Sm. Compend p. 49. E. B. t. 476.
 Hab. Woods and hedges.

IV. TETRAGYNIA.

PARNASSIA.

- P. palustris*, Sm. Compend. p. 49. E. B. t. 82.
 Hab. Marshy grounds; frequent. Marsh under Killiney hill, and low sandy grounds at Portmarnock, &c.

V. PENTAGYNIA.

STATICE.

- S. Armeria*, Sm. Compend. p. 50. E. B. t. 226.
 Hab. In salt marshes, and on the tops of the highest mountains. Plentiful at Portmarnock, and on the summit of Magilly-cuddy's reeks, county of Kerry.
S. Limonium, Sm. Compend. p. 50. E. B. t. 102.
 Hab. Strand near Passage; Mr. Drummond. On the South side of Howth, on banks near the Sea.
S. reticulata, Sm. Compend. p. 50. E. B. t. 328.
 Hab. On the muddy strand of Portmarnock opposite Beldoyle, abundant.

LINUM.

- L. usitatissimum*, Sm. Compend. p. 50. E. B. t. 1357.
 Hab. Fields and way sides, occasionally.
L. perenne, Sm. Compend. p. 50. E. B. t. 40.
 Hab. Near Monkstown, county of Cork; Mr. Drummond.
L. angustifolium, Sm. Compend. p. 50. E. B. t. 381.
 Hab. Fields beyond Dundrum, and in fields between Killiney hill and Bray; also in the Phoenix-park near Chapelizod, and elsewhere near Dublin.
L. catharticum, Sm. Compend. p. 50. E. B. t. 382.
 Hab. Dry sandy places. Plentiful on the sandy grounds about Beldoyle and Portmarnock.

HEXANDRIA.—MONOGYNIA.

VI. HEXAGYNIA.

DROSERA.

- D. rotundifolia*, Sm. Compend. p. 50. E. B. t. 867.
 Hab. Bogs and moist heathy grounds. Bog near the summit of Howth, and near the foot of Dublin mountains.
- D. longifolia*, Sm. Compend. p. 50. E. B. t. 868.
 Hab. Bogs and wet places in the Southern counties.
- D. anglica*, Sm. Compend. p. 50. E. B. t. 869.
 Hab. Frequent in Fermanagh; Dr. Scott. In a bog between Newport and Castle-Connell, along with the last. Frequent in Kerry.



VI. HEXANDRIA.

I. MONOGYNIA.

GALANTHUS.

- G. nivalis*, Sm. Compend. p. 52. E. B. t. 19.
 Hab. Fields near the Black-rock; scarcely indigenous.
 Near Cork in a naturalized state; Mr. Drummond. Not found wild of late near Dublin.

NARCISSUS.

- N. biflorus*, Sm. Compend. p. 52. E. B. t. 276.
 Hab. Fields near Dublin, frequent.
- N. Pseudo-narcissus*, Sm. Compend. p. 52. E. B. t. 17.
 Hab. Fields near Templeogue.

ALLIUM.

- A. arenarium*, Sm. Compend. p. 53. E. B. t. 1358.
 Hab. Plentiful at Portmarnock sands.
- A. carinatum*, Sm. Compend. p. 53. E. B. t. 1658.
 Hab. In a field on the right hand side of the Royal Canal, as you go from the Bridge, near Glasnevin Turnpike, where it was pointed out to me by the late Dr. Scott.

HEXANDRIA.—MONOGYNIA.

A. vineale, Sm. compend. p. 53. E. B. t. 1974.

Hab. Pasture fields near Dublin, frequent. Fields near the College Botanic Garden.

A. ursinum, Sm. Compend. p. 53. E. B. t. 122.

Hab. Woods, common.

HYACINTHUS.

H. non scriptus, Sm. Compend. p. 54. E. B. t. 337 (*Scilla nutans*).

Hab. Woods and pastures. On Killiney hill. Wood at Howth Castle, &c.

SCILLA.

S. verna, Sm. Compend. p. 54. E. B. t. 23.

Hab. Plentiful on Howth and Ireland's-Eye, on dry grounds near the sea, and on Killiney hill. The bulbs of this are said to be solid, which is not the case.

NARTHECIUM.

N. ossifragum, Sm. Compend. p. 54. E. B. t. 535.

Hab. In bogs, common.

JUNCUS.

J. acutus, Sm. Compend. p. 55. E. B. t. 1614.

Hab. Sandy shores between Wicklow and Arklow; Mr. Hodgins.

J. maritimus, Sm. Compend. p. 55. E. B. t. 1725.

Hab. Marshy places by the sea side between Kingstown harbour and Bullock, and under Killiney hill, abundant.

J. glaucus, Sm. Compend. p. 55. E. B. t. 665.

Hab. Wet pastures, &c. Planted on the banks of the Grand Canal to bind the earth.

J. effusus, Sm. Compend. p. 55. E. B. t. 836.

Hab. Marshes on Howth, and near Kingstown, &c.

J. conglomeratus, Sm. Compend. p. 55. E. B. t. 1835.

Hab. Marshy grounds, frequent. The most common rush.

J. squarrosus, Sm. Compend. p. 55. E. B. t. 933.

Hab. Heathy moorish grounds, common.

J. bulbosus, Sm. Compend. p. 55. E. B. t. 934.

Hab. Salt marshes, common.

J. bufonius, Sm. Compend. p. 56. E. B. t. 802.

Hab. Moist grounds that have been covered with water in winter.

J. uliginosus, Sm. Compend. p. 55. E. B. t. 2144.

Hab. Moist grounds, common.

J. acutiflorus, Sm. Compend. p. 55. E. B. t. 238 (*J. articulatus*).

Hab. Bogs and marshes, common.

J. lampocarpus, Sm. Compend. p. 55. E. B. t. 2143.

Hab. Bogs, frequent.

HEXANDRIA.—DIGYNIA.—TRIGYNIA.

- J. obtusiflorus*, Sm. Compend. p. 55. E. B. t. 2144.
 Hab. Bogs near Cork; Mr. Drummond.

LUCIOLA.

- L. pilosa*, Sm. English Flora, vol. 2. p. 178. Sm. Compend p. 56. E. B. t. 736 (*Juncus pilosus*.) Galp. Compend. p. 32, (*Luzula pilosa*).
 Hab. Woods, frequent.
L. sylvatica, Sm. English Flora, vol. 2. p. 180. Sm. Compend. p. 56. E. B. t. 737. (*Juncus Sylvaticus*.) Galp. Compend. p. 33. (*Luzula sylvatica*).
 Hab. Woods and shady places, frequent.
L. campestris, Sm. English Flora, vol. 2. p. 181. Sm. Compend. p. 56. E. B. t. 672 (*Juncus campestris*).
 Hab. In dry barren pastures, frequent.
L. congesta, Sm. English Flora, vol. 2. p. 181.
Juncus campestris β. Fl. Br. 386.
Luzula campestris β. Hook. Fl. Scot. 110.
 Hab. Feather-bed Mountain near Lough Bray.

BERBERIS.

- B. vulgaris*. Sm. Compend. p. 56. E. B. t. 49.
 Hab. Frequent in hedges at Ballyarthur near Fermoy; Mr Drummond.

PEPLIS.

- P. portula*, Sm. Compend. p. 56. E. B. t. 1211.
 Hab. Frequent in the county of Wicklow in watery places. By the way side near Roundwood, &c.

II. DIGYNIA.

OXYRIA.

- O. reniformis*, Hook. Fl. Scot. p.111. Sm. Compend. p. 57. et. E. B. t. 910 (*Rumex digynus*).
 Hab. Moist rocks on mountains. Galtymore, county of Tipperary, and on Magillycuddy's reeks and Brandon mountain, county of Kerry.

III. TRIGYNIA.

RUMEX.

- R. aquaticus*, Sm. Compend. p. 57. E. B. t. 2014.
 Hab. Banks of the Shannon near Limerick.

HEXANDRIA.—POLYGINIA.

- R. crispus*, Sm. Compend. p. 57. E. B. t. 1998.
 Hab. Way sides, frequent.
R. sanguineus, Sm. Compend. p. 57. E. B. t. 1533.
 Hab. In an old orchard near Friars' Walk, Cork; Mr. Drummond.
R. acutus, Sm. Compend. p. 57. E. B. T. 724.
 Hab. In waste grounds, common.
R. pulcher, Sm. Compend. p. 57. E. B. t. 1576.
 Hab. Abundant about Friars' Walk, Cork; Mr Drummond.
R. obtusifolius, Sm. Compend. p. 57. E. B. t. 1999.
 Hab. Way sides and waste places, frequent.
R. maritimus, Sm. Compend. p. 57. E. B. t. 725.
 Hab. In a marsh near Clay-Castle, Youghal; Mr. Drummond.
R. palustris, Sm. Compend. p. 57. E. B. t. 1932.
 Hab. Marshy grounds near Youghal, along with the last; Mr. Drummond.
R. acetosa, Sm. Compend. p. 57. E. B. t. 1674.
 Hab. Dry upland pastures, frequent.
R. acetocella, Sm. Compend. p. 57. E. B. t. 1674.
 Hab. Dry upland pastures, frequent.

TRIGLOCHIN.

- T. palustre*, Sm. Compend. p. 57. E. B. t. 366.
 Hab. Marshes, frequent.
T. maritimum, Sm. Compend. p. 57. E. B. t. 225.
 Hab. Salt marshes, frequent.

POLYGYNIA.

ALISMA.

- A. Plantago*, Sm. Compend. p. 58. E. B. t. 837.
 Hab. Ditches and banks of rivers, frequent.
A. ranunculoides, Sm. Compend. p. 58. E. B. t. 326.
 Hab. Ditches and bogs. In the marsh between Kingstown and Killiney hill, and on Howth.
A. natans, Sm. Compend. p. 58. E. B. t. 755.
 Hab. On Howth, in ditches near the large marsh, and very common in Cunnamara.

HEPTANDRIA AND OCTANDRIA.—MONOGYNIA.

VII. HEPTANDRIA.

I. MONOGYNIA.

There is no plant in this small Class found wild in Ireland. The *Trientalis europæus*, found in the Highlands of Scotland, is the only British plant belonging to it.

VIII. OCTANDRIA.

I. MONOGYNIA.

EPILOBIUM.

- E. angustifolium*, Sm. Compend. p. 60. E. B. t. 1947.
 Hab. Among loose stones at the Scalp, left hand side of the road as you go to Enniskerry.
E. hirsutum, Sm. Compend. p. 60. E. B. t. 838.
 Hab. Sides of ditches and rivers, common.
E. parviflorum, Sm. Compend. p. 60. E. B. t. 795.
 Hab. Marshes, and by running streams.
E. palustre, Sm. Compend. p. 60. E. B. t. 346.
 Hab. Bogs and sides of lakes.
E. tetragonum, Sm. Compend. p. 60. E. B. t. 1948.
 Hab. Ditches and marshy grounds, common.
E. montanum. Sm. Compend. p. 60. E. B. t. 1177.
 Hab. Stony places, and under hedges, &c.

CHLORA.

- C. perfoliata*, Sm. Compend. p. 60. E. B. t. 60.
 Hab. Frequent in the county of Dublin in gravelly soils. Not found in the Southern counties.

VACCINIUM.

- V. Myrtilus*, Sm. Compend. p. 60. E. B. t. 456.
 Hab. Woods and heaths, frequent.

OCTANDRIA.—TRIGYNIA.

- V. Vitis Idæa*, Sm. Compend. p. 60. E. B. t. 598.
 Hab. Dry mountainous heaths. Plentiful in the high grounds near upper Lough
 Bray.
V. Oxycoccus, Sm. Compend. p. 61. E. B. t. 319.
 Hab. Turf bogs, frequent.

MENZIESIA.

- M. Dabeoci*, Sm. Compend. p. 61. E. B. t. 35 (*Erica Dabeoci*).
 Hab. Very plentiful in Cunnamara, and in the county of Mayo between the Killery
 and Croagh Patrick.

ERICA.

- E. cineria*, Sm. Compend. p. 61. E. B. t. 1015.
 Hab. Dry heaths, abundant; also in woods. In the woods of Muckruss it grows to
 the height of six feet and upwards.
E. tetralix, Sm. Compend. p. 61. E. B. t. 1014.
 Hab. Moist bogs. Occasionally, with white flowers.
E. vulgaris, Sm. Compend. p. 61. E. B. t. 1013. (*Caluna vulgaris*, Hook. Fl.
 Scot. p. 119).
 Hab. Heaths and moors, common. Sometimes found with white flowers.

ACER.

- A. Pseudo-platanus*, Sm. Compend. p. 61. E. B. t. 303.
 Hab. Hedges, and in plantations.
A. campestre, Sm. Compend. p. 61. E. B. t. 640.
 Hab. Hedges about Cork, scarcely indigenous; Mr. Drummond. Hedges at Bally-
 cullen, county of Dublin; Doctor Brinkley.

III. TRIGYNIA.

POLYGONUM.

- P. amphibium*, Sm. Compend. p. 62. E. B. t. 436.
 Hab. Ponds, ditches, and sides of lakes.
P. Persicaria, Sm. Compend. p. 62. E. B. t. 756.
 Hab. Moist grounds and waste places, common.
P. lapathifolium, Sm. Compend. p. 62. E. B. t. 1382.
 Hab. In low moist ground near Cork; Mr. Drummond.
P. Hydropiper, Sm. Compend. p. 62. E. B. t. 989.
 Hab. Ditches, and wet places near farm yards.

ENNEANDRIA.—HEXAGYNIA.

- P. minus*, Sm. Compend. p. 62. E. B. t. 1043.
 Hab. Moist grounds near Cork; Mr. Drummond.
P. Bistorta, Sm. Compend. p. 62. E. B. t. 509.
 Hab. Meadows near Bantry; Miss Hutchins. In a field at Ashtown near Monks-
 town; Captain Pratt.
P. aviculare, Sm. Compend. p. 62. E. B. t. 1044.
 Hab. Way sides, and in paved courts.
P. Convolvulus, Sm. Compend. p. 62. E. B. t. 941.
 Hab. Among corn. Often a weed in gardens.

III. TETRAGYNIA.

PARIS.

- P. quadrifolia*, Sm. Compend. p. 62. E. B. t. 7.
 Hab. Ross woods, Killarney; Smith, in his Statistical Survey of Kerry.

ELATINE.

- E. Hydropiper*, Sm. Compend. p. 63. E. B. t. 955.
 Hab. In a small lake by the road side near Bantry; Mr. Drummond. On the bor-
 ders of Castlewellan Lake, county of Down; pointed out to me there by
 Mr. Templeton.

IX. ENNEANDRIA.

I. HEXAGYNIA.

BUTOMUS.

- B. umbellatus*, Sm. Compend. p. 63. E. B. t. 651.
 Hab. In a ditch near the Grand Canal, a little below Lord Cloncurry's house, county
 of Kildare. Banks of the Shannon at Castle-Connel, and in other places
 near Limerick. In ditches near D'Esterre's Bridge, and in ditches near
 Corrofin, in great abundance.

DECANDRIA.—MONOGYNIA.—DIGYNIA.

X. DECANDRIA.

I. MONOGYNIA.

MONOTROPA.

M. Hypopitys, Sm. Compend. p. 64. E. B. t. 69.

- Hab. St. Catharine's, county of Dublin, under Beech trees, and at Moore Abbey, county of Louth, under Pine trees; Dr. Wade.

ANDROMEDA.

A. polifolia, Sm. Compend. p. 64. E. B. t. 713.

- Hab. Bogs in the Queen's county, and in the county of Kerry.
The broad leaved variety grows in a bog between Newport and Castle-Connel.

ARBUTUS.

A. unedo, Sm. Compend. p. 64. E. B. t. 2377.

- Hab. Plentiful in the woods at Muckruss, and in all the islands in the lower and upper lakes of Killarney, as well as at Glengariff, near Bantry. A tree of this fine evergreen in Rough-island, nearly opposite to O'Sullivan's-Cascade, was 9½ feet in girth, at a foot from the ground, when I measured it in August 1805.

A. uva-ursi, Sm. Compend. p. 65. E. B. t. 714.

- Hab. Limestone mountains, in the barony of Burren, county of Clare, abundant. It is also common on several of the mountains of Cunnamara.

PYROLA.

P. media, Sm. Compend. p. 65. E. B. t. 1945.

- Hab. On the heathy ground and on the rocks in Newtown-Ards park, and in many places in the county of Antrim; Mr. Templeton.

II. DIGYNIA.

CHRYSOSPLENIUM.

C. alternifolium, Sm. Compend. p. 65. E. B. t. 54.

- Hab. Near Belfast; Mr. Templeton.

DECANDRIA.—MONOGYNIA.—DIGYNIA.

C. oppositifolium, Sm. Compend p. 65. E. B. t. 496.

Hab. Margins of clear springs in shady places, common.

SAXIFRAGA.

* Calyx reflexed, inferior, leaves undivided. Flower stalks paniced, erect, much taller than the stems.

S. *Geum*. Kidney-leaved saxifrage. Leaves roundish, kidney-shaped, notched, somewhat hairy. Footstalks linear, hairy, channelled, much longer than the leaves. Flower-stalk paniced; capsule superior.

S. *Geum*, Sm. English Flora, vol. 2. p. 259.

α. Leaves hairy on both sides, the under surface beautifully reticulated with purple. Nearly allied to *Robertsonia crenata* of Haworth in Appen. Syn. Pl. Succulent; which may however be readily distinguished from this by its somewhat larger leaves, which are more obtusely notched.

β. Leaves smooth on both sides, more sharply toothed. E. B. t. 1561, (leaves smaller than usual.) *Robertsonia dentata*, Haw. in Appen. syn. Pl. Succulent. p. 325.

Readily distinguished from α, by its leaves being nearly smooth, and often much larger; and also by its petals being spotted with red, besides having a bright yellow stain. It grows in more elevated situations, and is much more common than α, which I only found in one place.

γ. Leaves light green, smooth and shining, sharply toothed. *Robertsonia polita*, Haw. as above.

δ. Leaves orbicular, dark green, smooth on both sides, petioles much shorter than in any of the preceding varieties. S. *elegans* J. T. Mackay, MSS. ined. Flowers spotted with red.

ε. Leaves hairy on both sides, smaller than in any of the preceding varieties. Flowers cream-coloured, spotless: Flower-stalk slender. S. *gracilis*, J. T. Mackay, MSS. ined.

Hab. α. In a sheltered spot below Turk water-fall, Killarney.

β. On Conner hill, near Dingle, and in sheltered cliffs on Mangerton near Killarney; also on Priest's Leap and other mountains in the county of Cork. The most common variety.

γ. On Conner cliffs near Dingle, 1805.

δ. On a rock near the summit of Turk mountain, Killarney, 1805.

ε. On Conner hill near Dingle, 1805.

Saxifraga *hirsuta*. Hairy oval-leaved Saxifrage.

Leaves oval, with cartilaginous serratures, slightly hairy; heart-shaped at the base. Footstalks linear, much longer than the leaves. Panicles somewhat forked. Capsule superior.

S. *hirsuta*, Sm. English Flora, vol. 2. p. 262. E. B. t. 2322.

Hab. Gap of Dunloe, near Killarney, 1805.

Readily distinguished from all the varieties of *S. geum* by its oval leaves, which are of a deep green colour. I have a variety sent me by the Rev. Mr. Brec, who had it from the Oxford Garden, with leaves considerably rounder; but I have not found it wild in Ireland.

DECANDRIA.—MONOGYNIA.—DIGYNIA..

- S. umbrosa*. London Pride, Saxifrage.
Leaves obovate, smooth, with sharp cartilaginous notches; tapering at the base into dilated footstalks. Panicle rather racemose. Capsule superior.
- S. umbrosa*, Sm. E. Flor. vol. 2. p. 263. E. B. t. 663.
- β. Leaves roundish, with sharp tooth like serratures. Footstalks elongated.
S. punctata, Haw. et Don. in Tr. L. Soc. vol. 13. 352. Not *S. punctata* of Linneus and Wildenoiw, (Smith).
- γ. Leaves oblong-obovate, smooth, light green, with deep acute serratures.
Robertsonia serrata, Haw. in Appen. Syn. Pl. succulent.
- α. Plentiful at Glengariff near Bantry, and on Conner cliffs near Dingle.
- β. On the summit of Magilly-cuddy's reeks. Common on the mountains in Cunnamara, county of Galway, and on Croagh Patrick, county of Mayo. Plants have also been sent to me by Mr. Templeton from Muckish, the highest mountain in Donegall.
- γ. Gap of Dunloe, near Killarney 1805.
- Saxifraga, Stellaris*. Starry Saxifrage. Sm. Compend. p. 65. E. B. t. 167.
- Hab. Wet rocks, and by the sides of rivulets on several of the Dublin and Wicklow mountains, as well as in the Southern counties.
- * * Stem leafy. Calyx partly or entirely inferior. Leaves undivided. Stigmas downy.
- S. oppositifolia*. Purple Saxifrage. Sm. Compend. p. 66. E. B. t. 9. Sm. E. Flora, vol. 2. p. 266.
- Hab. Mountains of Ennishowen; Robert Brown, Esq. Mountains in Joyce-country, near Lough Corrib,
- S. azoides*. Yellow mountain Saxifrage. Sm. Compend. p. 66. E. B. t. 39. Sm. E. Flora, vol. 2. p. 268.
- Hab. On a mountain near Sligo; Rev. Archdeacon Brinkley, D. D. On Ben Bulbin near Sligo, and on Conner cliffs near Dingle.
- * * * Calyx spreading. Leaves partly lobed. Stigmas mostly downy. Flowering stems erect, more or less leafy.
- S. granulata*. White Meadow Saxifrage. Sm. Compend. p. 66. E. B. t. 500. Sm. E. Flora. vol. 2. p. 269.
- Hab. On dry sandy ditch banks, between Beldoyle and Portmarnock. The double white Saxifrage of the Gardens is a variety of this.
- S. tridactilytes*, Rue-leaved Saxifrage. Sm. Compend. p. 66. E. B. t. 501. Sm. E. Flora. 271.
- Hab. Walls near Stillorgan, &c.
- S. caespitosa*. Tufted Alpine Saxifrage.
Radical leaves crowded, three or five cleft, obtuse, veiny, fringed, lowermost undivided. Flowers one to five or more. Germen half inferior, hairy, calyx smoother, obtuse. Petals rounded, triple ribbed.
- S. caespitosa*, Sm. Compend. p. 66. E. B. t. 794. Sm. E. Flora vol. 2 p. 273. α.
- β. *S. incurvifolia*, Sm. E. Flora. p. 276.
- Hab. Both varieties were found on a dry rock on the summit of Brandon mountain in September 1804.

DECANDRIA.—MONOGYNIA.—DIGYNIA.

The only difference between β . and the first variety is, that the segments of the leaves are incurved in β . One flower only was found on the stem of each in the wild state, but by cultivation they produced from three to nine flowers, as stated by Sir. J. E. Smith.

S. hirta, Hairy Alpine, Saxifrage.

Radical leaves, rather crowded, five or three cleft, points veiny, fringed. Flowers few, corymbose. German half inferior. Calyx acute. Petals obovate, triple ribbed.

S. hirta, Sm. Compend. p. 66. E. B. t. 2291. Sm. E. Flora. p. 275.

Hab. Moist rocks on Galtymore, county of Tipperary, and sides of rivulets near the summit of Magilly-cuddy's reeks, county of Kerry 1805.

S. levis, Smooth Alpine Saxifrage.

Radical leaves five cleft; those of the trailing shoots mostly three cleft, fringed below; lobes linear, pointed, smooth; segments of the calyx awl-shaped, pointed; petals obovate.

S. levis J. T. Mackey, MSS. inedited.

S. offinis Don. in Tr. of L. Soc. and Sm. E. Flora. vol. 2. p. 175.

Hab. On a Rock on the top of Brandon mountain county of Kerry 1805. Herb. bright green, densely tufted before flowering, afterwards throwing out many procumbent, lax, reddish, distantly leafy shoots, several inches long, the whole besprinkled with soft, slender, glutinous hairs. Leaves much elongated, linear at the base and fringed, divided about one third of their length into three lobes, which are smooth and shining, the lateral lobes of the radical leaves especially, cloven; all of them linear, or slightly lanceolate, acute, partly bristle pointed. Stems three or four inches high, erect, corymbose, bearing a few undivided, lanceolate leaves; and three to five flowers, on glandular or hairy upright stalks. German in like manner, hairy and viscid. Calyx half inferior; its segments spreading, at length recurved, acute, minutely bristle-pointed, slightly glandular. Petals white, obovate, twice the length of the Calyx, triple ribbed. Stigmas retuse, cloven, recurved, very hairy and glandular.

S. hypnoides. Mossy Saxifrage, or Ladies' Cushion.

Radical leaves three or five cleft; those of the long procumbent shoots undivided; all bristle-pointed and fringed. Segments of the Calyx ovate, pointed. Petals obovate. Stigmas nearly smooth.

S. hypnoides, Sm. E. Flora, vol. 2. p. 277. also *S. elongella*, p. 279, in my opinion.

Hab. Plentiful on all the limestone mountains near Sligo.

I have cultivated the Scotch *S. elongella* for many years, together with the Sligo plant, and see no difference between them.

SCLERANTHUS.

S. annus, Sm. Compend. p. 66. E. B. t. 351.

Hab. Gravelly banks of the Dodder above Templeogue.

DECANDRIA.—MONOGYNIA.—TRIGYNIA.

SAPONARIA.

S. officinalis, Sm. Compend. p. 67. E. B. t. 1060.

Hab. Fields of Odin above Rathfarnham. The variety, with double flowers, very common on the banks of the Dodder, near Ball's bridge and Donnybrook.

DIANTHUS.

D. hortensis. Willd. Enumeratio Plant. 469.

Hab. In an old quarry at Black-rock, and on cliffs at Hop-island near Cork; Mr. Drummond, who remarks, that this may be the plant mentioned by Smith in his history of the county of Cork, under the name of Dianthus Caryophyllus, as growing on an old Castle near Kinsale, which is now demolished, and that this pink is still to be found on old houses in the neighbourhood. The numerous double varieties of the Pheasant-eye pink, of the gardens, belong to this species.

TRIGYNIA.

SILENE.

S. anglica, Sm. Compend. p. 68. E. B. t. 1178.

Hab. Fields near Castletown, Bearhaven; Mr. Drummond.

S. inflata, Sm. Compend. p. 68. E. B. t. 164. Cucubalus Behen Wither.

Hab. Pastures and road sides, common.

S. maritima, Sm. Compend. p. 68. E. B. t. 957.

Hab. Upon the coast among small loose stones, common. Dr. Hooker, in his Flora Scotica, has, I think very properly, united with Wahlenburg in considering *S. maritima* only a variety of *inflata*.

S. acaulis, Sm. Compend. p. 68. E. B. t. 1081.

Hab. On rocks in a Glen at Magilligan, county of Derry; Mr. Templeton. On Ben Bulbin and other mountains near Sligo, 1806.

STELLARIA.

S. media, Sm. Compend. p. 69. E. B. t. 537.

Hab. Waste places and road sides.

S. holostea, Sm. Compend. p. 69. E. B. t. 511.

Hab. Ditch banks, woods, and hedges.

S. graminea, Sm. Compend. p. 69. E. B. t. 803.

Hab. Dry pastures, fields, and heaths, common.

S. Glauca, Sm. Compend. p. 69. E. B. t. 825.

Hab. Marshy grounds, in gravelly places. Plentiful in Glenree, between Enniskerry and Lough Bray.

S. uliginosa, Sm. Compend. p. 69. E. B. t. 1074.

Hab. In rivulets and ditches, frequent.

DECANDRIA.—PENTAGYNIA.

- S. cerastoides*, Sm. Compend. p. 68. E. B. t. 911.
 Hab. High mountains near Bantry, rare; Miss Hutchins.

ARENARIA.

- A. peploides*, Sm. Compend. p. 69. E. B. t. 189.
 Hab. Sea coast among loose gravelly soil.
A. trinervis, Sm. Compend. p. 68. E. B. t. 1483.
 Hab. Walls on the limestone ground near Cork; Mr. Drummond.
A. serpyllifolia, Sm. Compend. p. 68. E. B. t. 923.
 Hab. Walls and dry waste places, frequent.
A. rubra, Sm. Compend. p. 68. E. B. t. 852.
 Hab. Gravelly and sandy soils, frequent.
A. marina, Sm. Compend. p. 68. E. B. t. 958.
 Hab. Sea shores, frequent.
A. ciliata, Sm. Compend. p. 68. E. B. t. 1745.
 Hab. Limestone cliffs on a mountain adjoining Ben Bulbin, county of Sligo,
 1807.



X. DECANDRIA.

IV. PENTAGYNIA.

COTYLEDON.

- C. umbilicus*, Sm. Compend. p. 70. E. B. t. 1329.
 Hab. Rocks and loose stone walls in hilly situations, frequent.

SEDUM.

- S. Telephium*, Sm. Compend. p. 70. E. B. t. 1319.
 Hab. Near Carrigaline, county of Cork, in a naturalized state; Mr. Drummond.
S. dasyphyllum, Sm. Compend. p. 70. E. B. t. 657.
 Hab. Walls at Sundays-well, near Cork; Mr. Drummond.
S. anglicum, Sm. Compend. p. 70. E. B. t. 171.
 Hab. Rocks frequent; especially in dry exposed situations, as on Howth, Killiney-
 hill, &c.
S. acre, Sm. Compend. p. 70. E. B. t. 839.
 Hab. Wall tops, rocks, and stony places.
S. reflexum, Sm. Compend. p. 71. E. B. t. 695.
 Hab. Tops of old walls; rather rare. Old walls near Finglass.

DECANDRIA.—PENTAGYNIA.

S. glaucum, Sm. Compend. p. 71. E. B. t. 2477.

- Hab. By the side of a stream that supplies the Bason at Sundays-well, and on the top of a wall at upper Glaskeen; Mr. Drummond.

OXALIS.

O. Acetocella, Sm. Compend. p. 71. E. B. t. 762.

- Hab. Woods and hedge banks. Plentiful at the Dargle. A variety of this, with red flowers, has been found by Mr. Drummond, by the road side near Passage.

AGROSTEMMA.

A. Githago. Sm. Compend. p. 71. E. B. t. 741.

- Hab. Corn fields in sandy soils, as at Portmarnock, and near Kilbarrick Church.

LYCHNIS.

L. Flos Cuculi, Sm. Compend. p. 71. E. B. t. 573.

- Hab. Moist meadows and pastures, frequent.

L. dioica, Sm. Compend. p. 71. E. B. t. 1579, 1580.

α. flowers red, *L. diurna*, Sibthorp. Ox.

β. flowers white, *L. vespertina*, Sibthorp. Ox.

γ. flowers whitish, all hermaphrodite.

- Hab. Under hedges and in sandy fields, frequent. The white variety, and the variety with hermaphrodite flowers, very plentiful in fields near Beldoyle.

CERASTIUM.

C. vulgatum, Sm. Compend. p. 71. E. B. t. 789.

- Hab. Fields, pastures, and road sides.

C. viscosum, Sm. Compend. p. 72. E. B. t. 790.

- Hab. Sandy pastures and waste places, common.

C. semidecandrum, Sm. Compend. p. 72. E. B. t. 1630.

- Hab. On the ruins of Kilbarrick-church, on the strand as you go to Howth.

C. tetrandrum, Sm. Compend. p. 72. E. B. t. 166.

- Hab. On Howth, Sutton side, near the cliffs, plentiful.

C. arvense, Sm. Compend. p. 72. E. B. t. 93.

- Hab. Dry gravelly fields and ditch banks, frequent. Very common in the county of Dublin, near the coast.

SPERGULA.

S. arvensis, Sm. Compend. p. 72. E. B. t. 1535 and 1536 (*S. pentandra*.)

- Hab. Sandy corn fields, as at Kilbarrick and near Beldoyle.

S. nodosa, Sm. Compend. p. 72. E. B. t. 694.

- Hab. In damp sandy places, not unfrequent. Plentiful in the low grounds near Irishtown.

DODECANDRIA.—MONOGYNIA.—DIGYNIA.—TRIGYNIA.

- S. saginoides*, Sm. Compend. p. 72. E. B. t. 2105.
 Hab. On Bear-island, near the Telegraph; Mr. Drummond'

 XI. DODECANDRIA.

I. MONOGYNIA.

LYTHRUM.

- L. Salicaria*, Sm. Compend. p. 73. E. B. t. 1061.
 Hab. Ditches and banks of rivers, frequent.
 A variety, with downy leaves, found near Cork.
L. hyssopifolium, Sm. Compend. p. 73. E. B. t. 292.
 Hab. Ballymadder near Bannow, county of Waterford; James Tardy, Esq.

 II. DIGYNIA.

AGRIMONIA.

- Eupatoria*, Sm. Compend. p. 73. E. B. t. 1335.
 Hab. Borders of fields, and waste places by road sides, frequent.

 III. TRIGYNIA.

RESEDA.

- R. Luteola*, Sm. Compend. p. 74. E. B. t. 320.
 Hab. Waste places and sandy fields, frequent.
R. lutea. Sm. Compend. p. 74. E. B. t. 321.
 Hab. Gravelly bank by the side of the road, under the Strawberry banks, near Chapelizod.
R. alba. Per. Syn. Plant. vol. 2. p. 10.
 Hab. Sandy ditch banks at Portmarnock in great abundance, completely naturalized.

EUPHORBIA.

- E. Peplus*, Sm. Compend. p. 74. E. B. t. 959.
 Hab. Waste places, corn fields, and gardens.

ICOSANDRIA.—MONOGYNIA.

- E. exigua*, Sm. Compend. p. 74. E. B. t. 1336.
 Hab. Light soils and gravelly places; plentiful on dry banks by the rail-way under Killiney-hill.
- E. Portlandica*, Sm. Compend. p. 74. E. B. t. 441.
 Hab. On the ruins of Kilbarrick-church, on the strand between Clontarf and Howth, on the sand-hills opposite to Malahide, and on the sandy shore under Killiney hill.
- E. paralia*, Sm. Compend. p. 74. E. B. t. 195.
 Hab. On the sand-hills between Howth and Beldoyle, and at Portmarnock sand-hills, abundant.
- E. helioscopia*, Sm. Compend. p. 74. E. B. t. 441.
 Hab. Corn fields, sandy grounds, and gardens.
- E. hiberna*, Sm. Compend. p. 74. E. B. t. 1337.
 Hab. Abundant in the county of Cork; Mr. Drummond. Between lower and upper lakes of Killarney and other places in Kerry, plentiful.
- E. amygdaloides*, Sm. Compend. p. 74. E. B. t. 256.
 Hab. Castle-Barnard park near Bandon; Miss Hutchins and Mr. Drummond.

IV. DODECAGYNIA.

SEMPERVIVUM.

- S. tectorum*, Sm. Compend. p. 74. E. B. t. 1320.
 Hab. Thatched house tops and walls, frequent.

XII. ICOSANDRIA.

I. MONOGYNIA.

PRUNUS.

- P. Padus*, Sm. Compend. p. 76. E. B. t. 1383.
 Hab. Woods.
- P. Cerasus*, Sm. Compend. p. 76. E. B. t. 706.
 Hab. Hedges and woods.
- P. insitilea*, Sm. Compend. p. 76 E. B. t. 1783.
 Hab. Hedges near Merrion, &c.

ICOSANDRIA.—PENTAGYNIA.—POLYGYNIA.

- P. spinosa*, Sm. Compend. p. 76. E. B. t. 842.
Hab. Hedges, &c.

II. PENTAGYNIA.

CRATÆGUS.

- C. Oxyacantha*, Sm. Compend. p. 76. E. B. t. 2504.
Hab. Woods and hedges.

PYRUS.

- P. Malus*, Sm. Compend. p. 77. E. B. t. 179.
Hab. Woods and hedges.
P. ancuparia, Sm. Compend. p. 77. E. B. t. 337.
Hab. Woods and rocks in mountainous situations.
P. Aria, Sm. Compend. p. 77. E. B. t. 1858.
Hab. Woods and hedges. In many places in Cunnamara, and about Killarney, as has been also remarked by Dr. Wade.

SPIRÆA.

- S. ulmaria*, Sm. Compend. p. 77. E. B. t. 960.
Hab. Moist meadows and banks of ditches, common.

III. POLYGYNIA.

ROSA.

- R. spinosissima*, Sm. Compend. p. 77. E. B. t. 187.
Hab. Sandy heaths and ditch banks. Plentiful between Kilbarrick and Beldoyle, Portmarnock, Bray-head, &c.
R. hibernica, Sm. Compend. p. 78. E. B. t. 2196.
Hab. Road side between Belfast and Holywood; John Templeton, Esq. A variety of it frequent in the county of Cork; Mr. Drummond.
R. villosa, Sm. Compend. p. 78. E. B. t. 513.
Hab. Hedges near Fermoy; Mr. Drummond.
Ireland's-eye; Dr. Wade.
R. tomentosa, Sm. Compend. p. 78. E. B. t. 77 and 990. According to Hooker, (*R. scabriuscula*).
β. mollis, Hooker's Fl. Scot. Rosa mollis, E. B. t. 2459.
Hab. *α.* Both with white and red flowers, are found near the Seven Churches, and in glens among the Dublin and Wicklow mountains. *β.* found also near the Seven Churches. All the three varieties were also found near Cork by Mr Drummond.

ICOSANDRIA.—PENTAGYNIA.—POLYGYNIA.

- R. rubiginosa*, Sm. Compend. p. 78. E. B. t. 991.
 Hab. Hedges near Passage; Mr. Drummond.
R. dumetorum, Sm. Compend. p. 79. E. B. t. 2579. *R. rubiginosa* var. *inodora*. Hook. Fl. Scot.
 Hab. Woods at Castle-Hyde, near Cork; Mr. Drummond. In Hedges near the old church of Portmarnock, county of Dublin.
R. micrantha, Sm. Compend. p. 78. E. B. t. 2490.
 Hab. Hedges near the Botanic Garden, Cork; Mr. Drummond. This is now considered by Hooker and Lindley as only a variety of *R. rubiginosa*.
R. canina, Sm. Compend. p. 79. E. B. t. 992.
 Hab. Hedges, common.
R. cæsia, Sm. Compend. p. 78. E. B. t. 2367. *R. canina* var. Lindley and Hooker.
 Hab. Hedges near Belfast; Mr. Templeton. Common in the county of Cork; Mr. Drummond.
R. arvensis, Sm. Compend. p. 78. E. B. t. 188.
 Hab. Hedges, near Portmarnock Church, and by the road to Bray. This is the rose known in the nurseries in Scotland and England by the name of Ayrshire Rose.
R. systyla, Hook. Fl. Scot. part 1. p. 159. Sm. Compend. p. 79. E. B. t. 895 (*R. collina*).
 Hab. Hedges near Cork; Mr. Drummond.

RUBUS.

- R. idæus*, Sm. Compend. p. 79. E. B. t. 2442.
 Hab. Woods, common.
R. suberectus, Sm. Compend. p. 79. E. B. t. 2572.
 Hab. County of Cork, common; Mr. Drummond.
R. cæsius, Sm. Compend. p. 79. E. B. t. 826.
 Hab. Borders of fields. Common in the Queen's county.
R. corylifolius, Sm. Compend. p. 79. E. B. t. 527.
 H Hedges, common.
R. fruticosus, Sm. Compend. p. 79. E. B. t. 715.
 Hab. Hedges, common.
R. saxatilis, Sm. Compend. p. 79. E. B. t. 2233.
 Hab. Banks of Lough-Corrib, county of Galway; Dr. Wade. Among loose stones by the side of the lake at Muckruss, Killarney, ripening its fruit in July.

FRAGARIA.

- F. vesca*. Sm. Compend. p. 79. E. B. t. 1524.
 Hab. Woods.
F. elatior. Sm. Compend. p. 79. E. B. t. 2197.
 Hab. Duncomb's wood near Cork; Mr. Drummond.

ICOSANDRIA.—PENTAGYNIA.—POLYGYNIA.

F. scirilis, Sm. Compend. p. 79. E. B. t. 1785. *Potentilla fragaria*. Hook.
Fl. Scot.

Hab. Woods, banks, and dry pastures, frequent.

POTENTILLA.

P. fruticosa, Sm. Compend. p. 80. E. B. t. 88.

Hab. At Rock-Forest, county of Clare, the estate of Bindon Blood, Esq. on low swamps that are covered with water in winter.

P. anserina, Sm. Compend. p. 80. E. B. t. 861.

Hab. Road sides and moist meadows.

P. argentea, Sm. Compend. p. 80. E. B. t. 89.

Hab. Barren stony soils, but not very common. On Sugar-loaf mountain in the county of Wicklow.

P. reptans, Sm. Compend. p. 80. E. B. t. 862.

Hab. Road sides, common.

TORMENTILLA.

T. officinalis, Sm. Compend. p. 80. E. B. t. 863.

Hab. Barren pastures and heaths.

T. reptans, Sm. Compend. p. 80. E. B. t. 864.

Hab. Ditch banks near the Botanic Garden, Cork; Mr. Drummond.

GEUM.

G. urbanum. Sm. Compend. p. 81. E. B. t. 1400.

Hab. Woods, common.

G. rivale, Sm. Compend. p. 81. E. B. t. 106.

Hab. Moist woods and sides of mountains. In Sir Robert Staple's woods, Queen's county. On Brandon mountain, county of Kerry, and Priest's Leap mountain, county of Cork. In Woodlands, county of Dublin

DRYAS.

D. octopetala, Sm. Compend. p. 81. E. B. t. 451.

Hab. Limestone mountains, barony of Burren, county of Clare, in great abundance. Mr. Templeton finds it in the county of Antrim.

COMARUM.

C. palustre, Sm. Compend. p. 81. E. B. t. 172.

Hab. Bogs, common.

POLYANDRIA.—MONOGYNIA.

XIII. POLYANDRIA.

I. MONOGYNIA.

CHELIDONIUM.

C. majus, Sm. Compend. p. 82. E. B. t. 1581.

Hab. Waste places and way sides, near towns and villages. Under hedges on the great north road near Dundalk.

GLAUCIUM.

G. luteum. Sm. Compend. p. 82. E. B. t. 8.

Hab. Sandy sea shores, frequent.

PAPAYER.

P. hybridum, Sm. Compend. p. 82. E. B. t. 43.

Hab. Corn fields near Kilbarrick Church, and old gravel pits near Raheny.

P. Argemone, Sm. Compend. p. 82. E. B. t. 643.

Hab. Corn fields near Kilbarrick Church, &c.

P. dubium, Sm. Compend. p. 83. E. B. t. 644.

Hab. Sandy fields, common.

P. Rhœas, Sm. Compend. p. 83. E. B. t. 645.

Hab. Corn fields, common.

P. somniferum, Sm. Compend. p. 83. E. B. t. 2145.

Hab. Sandy fields near Kilbarrick Church. Way sides opposite to Lord Howth's Deer-park, and other places about Howth, not uncommon.

P. cambricum, Sm. Compend. p. 83. E. B. t. 66.

Hab. Rostrevor-hill, in crevices of rocks by the side of a stream, where it had been previously observed by Mr. John White.

NYMPHÆA.

N. alba, Sm. Compend. p. 83. E. B. t. 160.

Hab. Lakes, not unfrequent. Lough Dan and Glandelough, county of Wicklow, lakes about Killarney, and in Cunnamara, plentiful.

NUPHAR.

N. lutea, Sm. Compend. p. 83. E. B. t. 159. (*Nymphaea lutea*).

Hab. Lakes, frequent.

POLYANDRIA.—PENTAGYNIA.—POLYGYNIA.

TILIA.

- T. europæa*, Sm. Compend. p. 83. E. B. t. 610.
 Hab. Woods and parks, scarcely indigenous.

CISTUS.

- C. Helianthemum*, Sm. Compend. p. 83. E. B. t. 1321.
 Hab. Limestone rocks South Isles of Arran, the only place in Ireland where it has been found.

VI. PENTAGYNIA.

AQUILEGIA.

- A. vulgaris*, Sm. Compend. p. 84. E. B. t. 277.
 Hab. In a Furze-brake at the upper end of Duncomb's wood; Mr. Drummond.
 On Knockmaroon-hill near Chapelizod.

STRATIOTES.

- S. aloides*, Sm. Compend. p. 84. E. B. t. 379.
 Hab. In a drain near Crum Castle on the banks of Lough Erne; Dr. Scott. In drains by the side of the road near Castle Saunderson, county of Cavan.

POLYGYNIA.

ANEMONE.

- A. nemorosa*. Sm. Compend. p. 85. E. B. t. 355.
 Hab. Shady woods. In the Dargle and Powerscourt woods, abundant.
A. apennina. Sm. Compend. p. 85. E. B. t. 1062.
 Hab. This has been observed to grow in shady spots about the ground now occupied by the Royal Dublin Society's Garden; but, as I have not heard of its having been found any where else in the country, it may be put down as a doubtful native.

THALICTRUM.

- T. alpinum*, Sm. Compend. p. 85. E. B. t. 262.
 Hab. Lettery mountain, Cunnamara; Dr. Wade.

POLYANDRIA.—PENTAGYNIA.—POLYGYNIA.

- T. minus*, Sm. Compend. p. 85. E. B. t. 11.
 Hab. Road side near Beldoyle. On Portmarnock sand hills, on Ireland's-eye, and on cliffs at the Gap of Dunloe near Killarney, &c.
T. flavum, Sm. Compend. p. 85. E. B. t. 367.
 Hab. Marsh in Sir Robert Staples's woods, Queen's county, &c.

RANUNCULUS.

- R. Flammula*, Sm. Compend. p. 85. E. B. t. 387.
 Hab. Ditches and marshes, frequent.
R. Lingua. Sm. Compend. p. 85. E. B. t. 100.
 Hab. Sides of lakes and rivers, but not common. By the side of a lake in Lord Oriel's Demesne at Collen, and by the banks of the river Fergus a little above the bridge of Ennis.
R. Ficaria, Sm. Compend. p. 86. E. B. t. 584.
 Hab. Woods, meadows, and hedge banks.
R. auricomus, Sm. Compend. p. 86. E. B. t. 684.
 Hab. Woods and hedge banks. Plentiful at the Dargle.
R. sceleratus, Sm. Compend. p. 86. E. B. t. 681.
 Hab. Sides of ditches and pools, frequent.
R. bulbosus, Sm. Compend. p. 86. E. B. t. 515.
 Hab. Meadows and pastures, common.
R. hirsutus. Sm. Compend. p. 86. E. B. t. 1504.
 Hab. Moist rocks on Galtimore, county of Tipperary.
R. repens, Sm. Compend. p. 86. E. B. t. 516.
 Hab. Wet pastures and shady damp places.
R. acris, Sm. Compend. p. 86. E. B. t. 652.
 Hab. Meadows and pastures, very common.
R. arvensis, Sm. Compend. p. 86. E. B. t. 135.
 Hab. Corn fields near the Man of War, in a stiff soil.
R. parviflorus, Sm. Compend. p. 86. E. B. t. 120.
 Hab. Near Carrigrohan Castle, county of Cork; Mr. Drummond. Sand hills between Beldoyle and Howth.
R. hederaceus, Sm. Compend. p. 36. E. B. t. 2003.
 Hab. Ditches and wet places, common.
R. aquatilis, Sm. Compend. p. 86. E. B. t. 101.
 Hab. Lakes, ponds, and ditches, frequent.

TROLLIUS.

- T. europæus*, Sm. Compend. p. 86. E. B. t. 28.
 Hab. North of Ireland; Mr. Templeton.

CALTHA.

- C. palustris*, Sm. Compend. p. 87. E. B. t. 506.
 Hab. Marshes and ditches, common.

DIDYNAMIA.—GYMNOSPERMIA.

XIV. DIDYNAMIA.

I. GYMNOSPERMIA.

AJUGA.

- A. reptans*, Sm. Compend. p. 88. E. B. t. 489.
 Hab. Moist pastures and woods.

TEUCRIUM.

- T. Scorodonia*, Sm. Compend. p. 88. E. B. t. 1543.
 Hab. Woods, and dry stony and sandy places, frequent.
T. Chamædrys, Sm. Compend. p. 89. E. B. t. 680.
 Hab. On a ditch bank near the far field in the vicinity of the Cork Botanic Garden ;
 Mr. Drummond. Said to have been found on the borders of sandy fields
 at the Green-hills, on the road leading to Tallaght. Not found there of
 late.
S. Scordium. Sm. Compend. p. 89. E. B. t. 828.
 Hab. Banks of the river near the bridge, East of Castle Lyons ; Dr. Wade. In
 marshy grounds near the bridge of Portumna, county of Tipperary.

NEPETA.

- N. cataria*, Sm. Compend. p. 89. E. B. t. 137.
 Hab. Banks of the Dodder above Rathfarnham ; Doctor Allman. On the road
 side north of the Shannon, opposite Limerick.

MENTHA.

- M. sylvestris*, Sm. Compend. p. 89. E. B. t. 686.
 Hab. Waste grounds and watery places. Near Carrigaline, county of Cork ; Mr.
 Drummond.
M. rotundifolia, Sm. Compend. p. 89. E. B. t. 466.
 Hab. On a dry bank at Carlisle Fort, near Cove ; perhaps an outcast from a garden.
M. hirsuta, Sm. Compend. p. 89. E. B. t. 447, and t. 448. (*Mentha sativa*)
 Hooker.
 Hab. Ditches, banks of rivulets, and wet boggy grounds, frequent. A variable
 plant in appearance.
M. acutifolia, Sm. Compend. p. 89. E. B. t. 2415.
 Hab. Specimens in the Herbarium of the late Dr. Scott ; were found by him in the
 county of Fermanagh.

DIDYNAMIA.—GYMNOSPERMIA.

- M. rubra*, Sm. Compend. p. 89. E. B. t. 1413.
 Hab. Near Carrigrohan Castle; Mr Drummond. Between the Chapel of Kilmacnick, and the Glen of the Downs; Captain Percy Pratt.
- M. piperita*, Sm. Compend. p. 89. E. B. t. 687.
 Hab. On the banks of the Lee near Carrigrohan Castle, along with the last; Mr Drummond.
- M. arvensis*, Sm. Compend. p. 89. E. B. t. 449.
 Hab. Corn fields, not unfrequent.
- M. Pulegium*, Sm. Compend. p. 89. E. B. t. 1026.
 Hab. Ballycotton, near Cork; Mr. Drummond. Church-yard at Ennis, and in Lord Kenmare's park, Killarney; Dr. Wade. Very plentiful in ditches at Calnaferry and other places near Killarney.

GLECHOMA.

- G. hederacea*, Sm. Compend. p. 90. E. B. t. 853.
 Hab. Hedges and waste places, frequent.

LAMIUM.

- L. album*, Sm. Compend. p. 90. E. B. t. 768.
 Hab. Waste places, abundant.
- L. purpureum*, Sm. Compend. p. 90. E. B. t. 769.
 Hab. Dry fields and way sides. A common weed in gardens. A variety, with white flowers, has been observed at Castle Hyde county of Cork, by Mr. Drummond.
- L. incisum*, Sm. Compend. p. 90. E. B. t. 1933.
 Hab. Found occasionally with the last. Plentiful by the side of the foot-way between Simmon's-court and Donnybrook-bridge.
- L. amplexicaule*, Sm. Compend. p. 91. E. B. t. 770.
 Hab. Dry sandy fields and gardens.

GALEOPSIS.

- G. Tetrahit*, Sm. Compend. p. 91. E. B. t. 207.
 Hab. Corn fields and reclaimed bogs.
- G. versicolor*, Sm. Compend. p. 91. E. B. t. 667.
 Hab. Corn fields, &c. In Potato fields near Glasnevin; Mr. Underwood. In Potato fields near Sligo.

GALEOBDELON.

- G. luteum*, Sm. Compend. p. 91. E. B. t. 987
 Hab. Woods and shady places. In the Dargle and Powerscourt woods, &c.

DIDYNAMIA.—GYMNOSPERMIA.

BETONICA.

- B. officinalis*, Sm. Compend. p. 91. E. B. t. 1142.
 Hab. In woods and dry bushy places, generally in calcareous soils. Near Abbots-
 town, county of Dublin; Dr. Wade. In Muckruss and Ross woods, and
 in several of the islands in the lower Lake of Killarney.

STACKYS.

- S. sylvatica*, Sm. Compend. p. 91. E. B. t. 416.
 Hab. Woods and shady places, common.
S. ambigua, Sm. Compend. p. 91. E. B. t. 2089.
 Hab. Fields near Glasnevin; Mr. Underwood. Field between the Black Rock and
 Cabinteely; Captain Pratt.
S. palustris, Sm. Compend. p. 91. E. B. t. 1675.
 Hab. River banks and moist grounds, frequent.
S. arvensis, Sm. Compend. p. 91. E. B. t. 1154.
 Hab. Corn fields, &c. Fields near the Bandon road; Mr. Drummond. Limestone
 quarry near Tullamore.

BALLOTA.

- B. nigra*, Sm. Compend. p. 91. E. B. t. 46.
 Hab. Waste places near towns and villages.

MARRUBIUM.

- L. vulgare*, Sm. Compend. p. 92. E. B. t. 410.
 Hab. Waste places and way sides near towns and villages, but not common. County
 of Wicklow; Dr. Wade. Strand near Carrigaline; Mr. Drummond.

LEONURUS.

- L. Cardiaca*, Sm. Compend. p. 92. E. B. t. 286.
 Hab. Road side between Cork and Foaty; Mr. Drummond.

CLINPODIUM.

- C. vulgare*, Sm. Compend. p. 92. E. B. t. 1401.
 Hab. Hills and bushy places in calcareous or gravelly soils. Hilly grounds between
 Enniskerry and Bray. On several of the Islands, lower lake of Killarney,
 and road sides near Kenmare.

ORIGANUM.

- O. vulgare*, Sm. Compend. p. 92. E. B. t. 1143.
 Hab. Dry hilly and bushy places, not unfrequent. On the left hand side of the
 road as you enter Enniskerry, abundant.

DIDYNAMIA.—ANGIOSPERMIA.

THYMUS.

- T. Serpyllum*, Sm. Compend. p. 92. E. B. t. 1594.
 Hab. Fields and hilly places, abundant. The shrubby variety plentiful on the limestone rocks at Muckruss.
- T. Calamintha*, Sm. Compend. p. 92. E. B. t. 1676.
 Hab. Old walls near Cork; Mr. Drummond. Road side between the village of Monkstown and Glenagary; Captain Pratt. Near Newcastle, county of Wicklow; Mr. Smith.

SCUTELLARIA.

- S. galericulata*, Sm. Compend. p. 92. E. B. t. 523.
 Hab. Ballyphehane-bog, rare; Mr. Drummond. Bilberry-island, Lough Corrib on the shore, and other places, Doctor Wade. Foot of Glenagh mountain and other places near Killarney, abundant.
- S. minor*, Sm. Compend. p. 92. E. B. t. 524.
 Hab. Bogs and moist grounds in the counties of Cork and Kerry, abundant.

PRUNELLA.

- P. vulgaris*, Sm. Compend. p. 92. E. B. t. 961.
 Hab. Meadows and pastures, common.

II. ANGIOSPERMIA.

BARTSIA.

- B. viscosa*. Sm. Compend. p. 93. E. B. t. 1045.
 Hab. Moist fields and marshes in the southern counties. At Ballylickey near Bantry; at Calnafersey and near Dingle, county of Kerry; abundant.
- B. Odontites*, Sm. Compend. p. 93. E. B. t. 1415.
 Hab. Moist meadows and pastures.

RHINANTHUS.

- R. Crista-galli*, Sm. Compend. p. 93. E. B. t. 657.
 Hab. Meadows and pastures, abundant.

EUPHRASIA.

- E. officinalis*, Sm. Compend. p. 93. E. B. t. 1416.
 Hab. Dry heaths and pastures.

DIDYNAMIA.—ANGIOSPERMIA.

MELAMPYRUM.

- M. pratense*, Sm. Compend. p. 93. E. B. t. 113.
 Hab. Woods abundant. Plentiful at the Dargle.
β. palustris, on Mangerton.
M. sylvaticum, Sm. Compend. p. 93. E. B. t. 801.
 Hab. Bushy places near Glenarm; John Templeton, Esq.

LATHRÆA.

- L. squamaria*, Sm. Compend. p. 93. E. B. t. 50.
 Hab. Woods and shady places, parasitic on the roots of other plants. At Woodlands, Balruddery, and at Powerscourt-waterfall.

PEDIÇULARIS.

- P. palustris*, Sm. Compend. p. 93. E. B. t. 399.
 Hab. Wet and marshy places, abundant.
P. sylvatica, Sm. Compend. p. 94. E. B. t. 400.
 Hab. Moist places and heaths, common.

ANTIRRHINUM.

- A. Cymbalaria*, Sm. Compend. p. 94. E. B. t. 502.
 Hab. Woods at Vernon-mount, county of Cork; Mr. Drummond.
A. Elatine, Sm. Compend. p. 94. E. B. t. 692.
 Hab. Fields by the side of the Bandon road; Mr. Drummond. Corn fields at Rathkeale, county of Limerick; Henry Hardy, Esq.
A. repens. Sm. Compend. p. 94. E. B. t. 1253.
 Hab. Road side half way between Bandon and Dunmanway; Mr. Drummond. County of Antrim; Mr. Templeton. Old slate quarry a mile below Bandon, and by the old Castle near the river.
A. Linaria, Sm. Compend. p. 94. E. B. t. 658.
 Hab. Ditch banks in the counties of Kilkenny and Cork, &c.
A. minus, Sm. Compend. p. 94. E. B. t. 2014.
 Hab. Side of the road near Sunday's Well; Dr. Woods.
A. majus, Sm. Compend. p. 94. E. B. t. 129.
 Hab. Tops of old garden walls, near Dublin and elsewhere.
A. Orontium, Sm. Compend. p. 94. E. B. t. 1155.
 Hab. Fields near Monkstown, county of Cork; Mr. Drummond.

SCROPHULARIA.

- S. nodosa*, Sm. Compend. p. 94. E. B. t. 1554.
 Hab. Ditch banks and woods, common.
S. aquatica, Sm. Compend. p. 94. E. B. t. 854.
 Hab. Sides of rivers and ditches,

TETRADYNAMIA.—SILICULOSA.

S. Scorodonia, Sm. Compend. p. 95. E. B. t. 2009.

Hab. Marshes near Tralee. Smith's history of Kerry.

DIGITALIS.

D. purpurea. Sm. Compend. p. 95. E. B. t. 1297.

Hab. Dry hilly pastures in an argillaceous soil; occasionally with white flowers.

SIBTHORPIA.

S. europæa, Sm. Compend. p. 95. E. B. t. 649.

Hab. Under a wall by the road side, north side of Conner-hill, near Dingle.

LIMOSELLA.

L. aquatica, Sm. Compend. p. 95. E. B. t. 357.

Hab. In places where water has stood during the winter; near Ballynahinch, Cunnamara; Dr. Wade.

OROBANCHE.

O. major, Sm. Compend. p. 95. E. B. t. 421.

Hab. Near the lake at Luggy-law; at the Seven Churches, Devil's Glen, &c.

O. minor, Sm. Compend. p. 95. E. B. t. 422.

Hab. Hill of Howth, south side on steep banks near the sea; in Sir Robert Staples's woods, Queen's county; on the ruins of Muckruss Abbey, Killarney; and in the south Isles of Arran: always near the roots of Ivy, on which it appears to grow parasitically.

O. rubra, Sm. Compend. p. 95. E. B. t. 1786.

Hab. On basaltic rocks at Cave-hill near Belfast; John Templeton, Esq.



XV. TETRADYNAMIA.

I. SILICULOSA

CLYPEOLA.

Calyx erect; petals oblong, entire; silicle orbicular, compressed, one celled, one seeded, valves compressed and membranous.

C. jonthlaspi, Lamarck et De Candolle Flora Gallica, p. 377.

This curious little plant, a native of the Mediterranean shore, in the South of France, was found last summer by Henry Darley, Esq. on a dry sandy bank at Portmarnock sands, when on a botanical excursion along with me.

We have again, this present summer, found it sparingly on the same spot.

TETRADYNAMIA.—SILICULOSA

SUBULARIA.

- S. aquatica*, Sm. Compend. p. 97. E. B. t. 732.
 Hab. Borders of lakes under the water, in a gravelly bottom. In Lough Neagh; Sherard.

DRABA.

- D. verna*, Sm. Compend. p. 97. E. B. t. 586.
 Hab. Walls and dry banks, abundant.
D. incana, Sm. Compend. p. 97. E. B. t. 388.
 Hab. Cliffs on Magillycuddy's-reeks, and on Ben-bulben and other mountains near Sligo.
D. muralis, Sm. Compend. p. 97. E. B. t. 912.
 Hab. On the walls of Blarney-castle, sparingly; Mr. Drummond.

CAMELINA.

- C. sativa*, Galp. Compend. p. 63. Sm. Compend. p. 97. E. B. t. 1254 (*Alyssum sativum*).
 Hab. Frequent in fields of flax, but probably imported.

LEPIDIUM.

- L. latifolium*, Sm. Compend. p. 97. E. B. t. 182.
 Hab. Cork-abag, near Cove.
L. hirtum, Sm. Compend. p. 98. E. B. t. 1803.
 Hab. Fields near Warren-point; Mr. Templeton. On the Hill of Howth, and other places near Dublin, plentiful.

THLASPI.

- T. arvense*, Sm. Compend. p. 98. E. B. t. 1659.
 Hab. Side of the road between Ballybracken and Kilkenny. Lately found on Howth, by Captain Pratt.
T. Bursa-Pastoris, Sm. Compend. p. 98. E. B. t. 1485.
 Hab. Waste places.

COCHLEARIA.

- C. officinalis*, Sm. Compend. p. 98. E. B. t. 2403.
 Hab. Rocks and muddy places by the sea side.
C. anglica, Sm. Compend. p. 98. E. B. t. 552.
 Hab. River side below Cork; Mr Drummond. Banks of the Dodder, near Haig's Distillery.
C. danica, Sm. Compend. p. 98. E. B. t. 697.
 Hab. On the roofs of houses in Kinsale.

CORONOPUS.

- C. Ruellii*, Sm. Compend. p. 98. E. B. t. 1660.
 Hab. Road sides. Common about Dublin.

TETRADYNAMIA.—SILIKUOSA.

C. didyma, Sm. Compend. p. 98. E. B. t. 248.

Hab. Road side near Clerk's-bridge, Cork; Mr. W. Hinks.

ISATIS.

I. tinctoria, Sm. Compend. p. 99. E. B. t. 97.

Hab. Fields near Woodlands, county of Dublin.

CAKILE,

C. maritima, Gal. Compend. p. 64. E. B. t. 231 (*Bunias Cakile*).

Hab. Sandy sea shores, abundant.

CRAMBE.

C. maritima, Sm. Compend. p. 98. E. B. t. 924.

Hab. Strand near Bantry; Mr. Drummond. Sea coast between Malahide and Beldoyle.

II. SILIKUOSA.

CARDAMINE.

C. bellidifolia, Sm. Compend. p. 99. E. B. t. 2355.

Hab. Said to have been found on rocks about Finto, county of Clare; but I have never seen Irish specimens.

C. hirsuta, Sm. Compend. p. 100. E. B. t. 492.

Hab. Moist places. In the watery lane, near the College Botanic Garden.

C. pratensis, Sm. Compend. p. 100. E. B. t. 776.

Hab. Moist meadows, common.

NASTURTIIUM.

N. officinale, Gal. Compend. p. 65. E. B. t. 855 (*Sisymbrium nasturtium*).

Hab. Brooks and rivulets, frequent.

N. Sylvestri, Gal. Compend. p. 65. E. B. t. 2324 (*Sis. sylvestri*).

Hab. Low damp meadows, banks of Loch Erne; Dr. Scott.

N. terrestris, Gal. Compend. p. 65. E. B. t. 1747 (*Sis. terrestris*).

Hab. Low wet grounds between Mark's church and Ringsend, &c.

N. amphibium, Gal. Compend. p. 65. E. B. t. 1840 (*Sis. amphibium*).

Hab. Banks of Loch Erne; Dr. Scott.

SISYMBRIUM.

S. officinale, Gal. Compend. p. 65. E. B. t. 735. (*Erysimum officinale*).

Hab. Way sides and waste places, common.

S. Sophia, Gal. Compend. p. 65. Sm. Compend. p. 100. E. B. t. 963.

Hab. Sandy waste places and way sides, common.

TETRADYNAMIA.—SILIKUOSA.

- S. Irio*, Gal. Compend. p. 65. Sm. Compend. p. 100. E. B. t. 1631.
 Hab. Way sides and waste places, common.

BARBAREA.

- B. vulgaris*, Gal. Compend. p. 65. Sm. Compend. p. 100. E. B. t. 443 (*Erys. Barbarea*).
 Hab. Among rubbish and on ditch banks. In the lane near the College Botanic Garden.

ERYSIMUM.

- E. Alliaria*, Gal. Compend. p. 65. Sm. Compend. p. 101. E. B. t. 796.
 Hab. Hedge banks and waste places. At Powerscourt near the church, &c.
E. cheiranthoides, Sm. Compend. p. 101. E. B. t. 942.
 Hab. Gravelly fields near Sunday's Well, county of Cork; Mr. Drummond.

CHEIRANTHUS.

- C. fruticosus*, Sm. Compend. p. 101. E. B. t. 1934.
 Hab. Old walls and castles.

MATHIOLA.

- M. sinuata*, Gal. Compend. p. 66. E. B. t. 462 (*Cheiranthus sinuatus*).
 Hab. In a small island, called Straw island, near the largest Island of Arran.

ARABIS.

- A. thaliana*, Sm. Compend. p. 101. E. B. t. 901.
 Hab. Old walls near Step-aside, between Dundrum and the Scalp.
A. ciliata, Gal. Compend. p. 66. E. B. t. 1746. (*Turritis alpina*).
 Hab. First found on the gravelly beach near Rinville, Cunnamara, in October 1805. It has since been found by Mr. Drummond on the western point of the barony of Bear, and on sand banks near Mr. O'Connell's Demesne, county of Kerry.
A. hirsuta, Gal. Compend. p. 66. E. B. t. 587 (*Turritis hirsuta*).
 Hab. On limestone rocks near Corrofin, and other places in the county of Clare, and on the old roof of St. Doulagh's church, county of Dublin.

BRASSICA.

- B. Napus*, Sm. Compend. p. 102. E. B. t. 2146.
 Hab. Tops of ditches and fields near Dublin, common.
B. Rapa, Sm. Compend. p. 102. E. B. t. 2176.
 Hab. Fields near Cork; Mr. Drummond.
B. Oleracea, Sm. Compend. p. 102. E. B. t. 637.
 Hab. On the cliffs near Youghal, sparingly; Mr. Drummond.

MONADELPHIA.—PENTANDRIA.—DECANDRIA.

SINAPIS,

- S. arvensis*, Sm. Compend. p. 102. E. B. t. 1748.
 Hab. Corn fields, common.
S. alba, Sm. Compend. p. 102. E. B. t. 1677.
 Hab. Fields near the Botanic Garden, Cork, the brown seeded variety; Mr. Drummond.
S. nigra, Sm. Compend. p. 102. E. B. t. 969.
 Hab. Portmarnock sands, and fields near Chapelizod.

RAPHANUS

- R. Raphanistrum*, Sm. Compend. p. 102. E. B. t. 856.
 Hab. Corn fields, frequent.

 XVI. MONADELPHIA.

I. PENTANDRIA.

ERODIUM.

- E. cicutarium*, Sm. Compend. p. 103. E. B. t. 1768.
 Hab. Dry sandy places and waste grounds. The variety with white flowers abundant between Kilbarrick church and Howth.
E. moschatum, Sm. Compend. p. 103. E. B. t. 1768.
 Hab. Sandy grounds, old walls and rocks. Sandy ditch banks near Simmond's-court. Plentiful on the rocks at Carlingford Castle. Lately found near Monks-town church, by Captain Pratt.
E. maritimum, Sm. Compend. p. 103. E. B. t. 646.
 Hab. Gravelly bank on the east side of Howth, &c.

 II. DECANDRIA.

GERANIUM.

- G. sylvaticum*, Sm. Compend. p. 103. E. B. t. 121.
 Hab. North of Ireland. On a rock at the Giants-causeway; Mr. Mansfield, and Miss Scott.
G. robertianum, Sm. Compend. p. 104. E. B. t. 1486.
 Hab. Woods, ditches, and stony places, frequent.
G. lucidum, Sm. Compend. p. 104. E. B. t. 75.
 Hab. On walls near Cork; Mr. Drummond. On the thatch of old houses in the suburbs of Ennis and Killarney, and on walls.

MONADELPHIA.—POLYANDRIA.

- G. molle*, Sm. Compend. p. 104. E. B. t. 178.
Hab. Dry pastures and waste places, common.
G. pusillum, Sm. Compend. p. 104. E. B. t. 385.
Hab. Side of the road near the Ovens, county of Cork; Mr. Drummond.
G. pyrenaicum, Sm. Compend. p. 104. E. B. t. 405.
Hab. Sandy fields and waste places near Dublin, frequent.
G. rotundifolium, Sm. Compend. p. 104. E. B. t. 1106.
Hab. In several small islands at Cove, and by the side of the road between Cork and Glanmire, &c.
G. dissectum, Sm. Compend. p. 104. E. B. t. 753.
Hab. Sandy grounds and waste places.
G. columbinum, Sm. Compend. p. 104. E. B. t. 259.
Hab. Dry pastures near Kilcrea, county of Cork; Mr. Drummond.
G. sanguineum, Sm. Compend. p. 104. E. B. t. 272.
Hab. Rocky places on the east side of the Hill of Howth, and Killiney-hill, &c.

III. POLYANDRIA.

ALTHÆA.

- A. officinalis*, Sm. Compend. p. 104. E. B. t. 147.
Hab. Marshes, rare. Cable Island near Youghal and Cape-clear Island; Mr. Drummond. Marshy grounds north side of the Shannon, near Limerick.

MALVA.

- M. sylvestris*, Sm. Compend. p. 104. E. B. t. 671.
Hab. Waste places and by way sides, very common.
M. rotundifolia, Sm. Compend. p. 104. E. B. t. 1092.
Hab. Waste places and by way sides. Plentiful near Sandymount.
M. moschata, Sm. Compend. p. 104. E. B. t. 742.
Hab. Road sides and dry pastures. Dry bank as you enter into Enniskerry, and road sides county of Kilkenny.

LAVATERA.

- L. arborea*, Sm. Compend. p. 104. E. B. t. 1841.
Hab. Rocks on the sea coast. On Ireland's-eye, and on old walls near the harbour of Galway. On cliffs on the south isles of Arran, and near Dingle.

DIADELPHIA.—HEXANDRIA.—OCTANDRIA.—DECANDRIA.

XVII. DIADELPHIA.

I. HEXANDRIA.

FUMARIA.

- F. officinalis*, Sm. Compend. p. 106. E. B. t. 589.
 Hab. Corn fields and gardens, frequent.
- F. capreolata*, Sm. Compend. p. 106. E. B. t. 943.
 Hab. Waste grounds. Fields near Ball's-bridge and Kilbarrick-church, &c.
- F. claviculata*, Sm. Compend. p. 106. E. B. t. 103.
 Hab. Rocks, walls, and old thatched houses tops, in elevated situations. On thatched cabins near the Little Dargle.

II. OCTANDRIA.

POLYGALA.

- P. vulgaris*, Sm. Compend. p. 106. E. B. t. 76.
 Hab. Dry hilly pastures, frequent.

III. DECANDRIA.

SPARTIUM.

- S. scoparium*, Sm. Compend. p. 107. E. B. t. 1339.
 Hab. Dry fields and bushy places, plentiful.

GENISTA.

- G. tinctoria*, Sm. Compend. p. 107. E. B. t. 805.
 Hab. Fields between Killiney-hill and Bray. First pointed out to me there, by Doctor Allman.

ULEX.

- U. europæus*, Sm. Compend. p. 107. E. B. t. 742.
 Hab. Upland fields and hilly grounds, common.

DIADELPHIA.—HEXANDRIA.—OCTANDRIA.—DECANDRIA.

- U. nanus*, Sm. Compend. p. 107. E. B. t. 743.
 Hab. Hilly grounds, frequent.
U. strictus, Irish Furze.
 Hab. Marquis of Londonderry's park, county of Down; Mr. John White.
 This appears to be a new and distinct species; but, as it rarely produces flowers, has not yet been described. It may however be readily distinguished from the other two species by its erect mode of growth. It is easily propagated from cuttings, and forms a neat hedge.

ONONIS.

- O. arvensis*, Sm. Compend. p. 107. E. B. t. 682.
 Hab. Barren pastures and sandy sea shores.

ANTHYLLIS.

- A. vulneraria*, Sm. Compend. p. 107. E. B. t. 104.
 Hab. Dry pastures, common. Varieties of this species are found on the coast near Ballylickey, Bantry, and elsewhere on the southern coast, with red and striped flowers, and even with white flowers, as has also been remarked by Mr. Drummond. The common variety has yellow flowers.

PISUM.

- P. maritimum*, Sm. Compend. p. 107. E. B. t. 1016.
 Hab. Sand hills, bay of Castle-main, county of Kerry.

OROBUS.

- O. tuberosus*, Sm. Compend. p. 107. E. B. t. 1153.
 Hab. Woods and dry banks.

LATHYRUS.

- L. pratensis*, Sm. Compend. p. 107. E. B. t. 670.
 Hab. Moist meadows, and ditch banks.

VICIA.

- V. sylvatica*, Sm. Compend. p. 108. E. B. t. 79.
 Hab. In a small wood on the banks of the Dodder, near the Gap of Ballinascorney. Plentiful by the side of the lake at Muckruss, Killarney, among loose stones.
V. Cracca, Sm. Compend. p. 108. E. B. t. 1168.
 Hab. Fields and bushy places, common.
V. sativa, Sm. Compend. p. 108. E. B. t. 334.
 Hab. Dry sandy fields and banks, common.

DIADELPHIA.—DECANDRIA.

- V. lathyroides*, Sm. Compend. p. 108. E. B. t. 30.
 Hab. Sandy fields near Kilbarrick church.
V. sepium, Sm. Compend p. 109. E. B. t. 79.
 Hab. Woods, ditch banks, and shady places, frequent.

ERVUM.

- E. hirsutum*, Sm. Compend. p. 109. E. B. t. 970.
 Hab. Corn fields and dry pastures, common.

ORNITHOPUS.

- O. perpusillus*, Sm. Compend. p. 109. E. B. t. 369.
 Hab. Sandy fields. Plentiful on Howth.

TRIFOLIUM.

- T. officinale*, Sm. Compend. p. 110. E. B. t. 1346.
 Hab. Salt marshes near Beldoyle, abundant.
T. ornithopodioides, Sm. Compend. p. 110. E. B. t. 1047.
 Hab. Dry barren pastures. On the South-east side of Killiney-hill, and near Bullock, abundant.
T. repens, Sm. Compend. p. 110. E. B. t. 1769.
 Hab. Meadows and pastures, common.
T. pratense, Sm. Compend. p. 110. E. B. t. 1770.
 Hab. Meadows and pastures, frequent.
T. medium, Sm. Compend. p. 110. E. B. t. 190.
 Hab. Ditch banks on the limestone ground near Cork; Mr. Drummond.
T. maritimum, Sm. Compend. p. 110. E. B. t. 220.
 Hab. Sandy fields and ditch banks near Kilbarrick church.
T. arvense, Sm. Compend. p. 110. E. B. t. 944.
 Hab. Dry sandy pastures near Beldoyle, and at Portmarnock sands, abundant.
T. scabrum, Sm. Compend. p. 110. E. B. t. 903.
 Hab. In a gravel pit at Sandymount, and on dry sandy banks near Kilbarrick church.
T. fragiferum, Sm. Compend. p. 110. E. B. t. 1050.
 Hab. Moist grounds by the lake at Sandymount.
T. procumbens, Sm. Compend. p. 111. E. B. t. 945.
 Hab. Dry pastures. Plentiful near Dunleary.
T. minus, Sm. Compend. p. 111. E. B. t. 1256.
 Hab. Dry pastures, frequent.
T. filiforme, Sm. Compend. p. 111. E. B. t. 1257.
 Hab. Wettish sandy places.

LOTUS.

- L. corniculatus*, Sm. Compend. p. 111. E. B. t. 2090.

POLYADELPHIA.—POLYANDRIA.

- β. major*, larger, stems nearly erect. *L. major*, E. B. t. 2091.
 Hab. pastures. *β.* At Dunran, Newtown Mount Kennedy.
L. diffusus, Sm. Compend. p. 111. E. B. t. 925.
 Hab. On the strand near Passage; Mr. Drummound.

MEDICAGO.

- M. sativa*, Sm. Compend. p. 112. E. B. t. 1749.
 Hab. Sandy fields at Portmarnock, perfectly naturalized.
M. lupulina, Sm. Compend. p. 112. E. B. t. 941.
 Hab. Sandy fields, common.



XVIII. POLYADELPHIA.

I. POLYANDRIA.

HYPERICUM.

- H. calycinum*, Sm. Compend. p. 112. E. B. t. 2017.
 Hab. Rocks in Muckruss-woods, 1804. Perfectly naturalized in Powerscourt woods.
H. Androsænum, Sm. Compend. p. 112. E. B. t. 1225.
 Hab. Under hedges and in woods in the county of Dublin, frequent,
H. quadrangulum, Sm. Compend. p. 112. E. B. t. 370.
 Hab. Moist pastures, and sides of ditches and rivulets.
H. perforatum, Sm. Compend. p. 113. E. B. t. 295.
 Hab. Woods, thickets, and hedges, frequent.
H. dubium, Sm. Compend. p. 113. E. B. t. 296.
 Hab. Ditch banks between Cullenagh and Stradbally, and near Inistioge, county of
 Kilkenny.
H. humifusum, Sm. Compend. p. 113. E. B. t. 1226.
 Hab. Gravelly pastures and road sides in the county of Wicklow, frequent. Plen-
 tiful on Howth.
H. hirsutum, Sm. Compend. p. 113. E. B. t. 116.
 Hab. Woods at Salmon-leap and Woodlands, abundant.
H. pulchrum, Sm. Compend. p. 113. E. B. t. 1227.
 Hab. Dry woods and fields, not uncommon. In the Dargle and on Howth, abundant.
H. clodes, Sm. Compend. p. 131. E. B. t. 109.
 Hab. Bogs in the county of Wicklow, and in the southern counties, abundant.



SYNGENESIA.—POLYGAMIA ÆQUALIS.

XIX. SYNGENESIA.

I. POLYGAMIA ÆQUALIS.

TRAGOPOGON.

T. pratense, Sm. Compend. p. 116. E. B. t. 434.

Hab. Fields near Ball's-bridge.

HELMINTHIA.

H. echioides, Gal. Compend. p. 76. Sm. Compend. p. 116 and E. B. t. 972.

Picris echioides.

Hab. Way sides. By the side of the mill-stream a little way above Donnybrook, abundant.

PICRIS.

P. hieracioides, Sm. Compend p. 116. E. B. t. 196.

Hab. Portmarnock sands, sparingly.

SONCHUS.

S. arvensis, Sm. Compend. p. 116. E. B. t. 674.

Hab. Corn fields, frequent.

S. oleraceus, Sm. Compend. p. 117. E. B. t. 843.

Hab. Waste places and cultivated grounds, very common.

PRENANTHES.

P. muralis, Sm. Compend. p. 117. E. B. t. 457.

Hab. Woods at Collon, abundant; Dr. Wade.

LEONTODON.

L. Taraxacum, Sm. Compend. p. 117. E. B. t. 510.

Hab. Meadows and pastures, abundant.

L. palustre, Sm. Compend. p. 117. E. B. t. 553.

Hab. In the Dargle by the side of the river.

THRINICIA.

T. hirta, Gal. Compend. p. 76. Sm. Compend. p. 117 and E. B. t. 555

(*Apargia hirta*).

Hab. Portmarnock and other sandy grounds in the vicinity of Dublin, abundant.

SYNGENISIA.—POLYGAMIA ÆQUALIS.

APARGIA.

- A. hispida*, Sm. Compend. p. 117. E. B. t. 554.
 Hab. Dry pastures. At Portmarnock, abundant.
A. Taraxaci, Sm. Compend. p. 117. E. B. t. 1109 (Hedypnois *Taraxaci*).
 Hab. Moist cliffs on Magillicuddy's-reeks, county of Kerry.
A. autumnalis, Sm. Compend. p. 117. E. B. t. 830 (Hedypnois *autumnalis*.)
 Hab. Fields and pastures, frequent.

HIERACIUM.

- H. pilosella*, Sm. Compend. p. 118. E. B. t. 1093.
 Hab. Dry banks and pastures, common.
H. murorum, Sm. Compend. p. 118. E. B. t. 2082.
 Hab. Rocks near Bantry; Mr. Drummond.
H. sylvaticum, Sm. Compend. p. 118. E. B. t. 2031.
 Hab. Rocks at the Dog-leap, near Limavady, county of Derry; Mr. Templeton.
 Devil's Glen, county of Wicklow.
H. pulmonarium, Sm. Compend. p. 118. E. B. t. 2307.
 Hab. Newtownards Glen; Mr. Templeton.
H. paludosum, Sm. Compend. p. 118. E. B. t. 1094.
 Hab. Woods near the river Lee, rare; Mr. Drummond. Newtownards Glen;
 Mr. Templeton.
H. villosum, Sm. Compend. p. 113. E. B. t. 2379.
 Hab. Moist rocks on Magillicuddy's-reeks, county of Kerry, 1805. A specimen
 in the Herbarium of Doctor Robert Graves, was found by him in the
 Devil's Glen.
H. sabaudum, Sm. Compend. p. 118. E. B. t. 349.
 Hab. Woods near Bantry; Miss Hutchins, who also found a variety with spotted
 leaves. Ross Island, Killarney; where it had previously been observed by
 Dr. Wade.
H. prenanthoides, Sm. Compend. p. 119. E. B. t. 2235.
 Hab. In several Glens near Belfast; Mr. Templeton.
H. umbellatum, Sm. Compend. p. 119. E. B. t. 1771.
 Hab. Devil's Glen, county of Wicklow.

CREPIS.

- C. tectorum*, Sm. Compend. p. 119. E. B. t. 1111.
 Hab. Meadows and dry pastures, common.
C. biennis, Sm. Compend. p. 119. E. B. t. 149.
 Hab. Sandy fields and ditch banks at Portmarnock, and near Beldoyle.

HYPOCHERIS.

- H. radicata*, Sm. Compend. p. 119. E. B. t. 831.
 Hab. Meadows and pastures, common.

SYNGENESIA.—POLYGAMIA ÆQUALIS.

LAPSANA.

- L. communis*, Sm. Compend. p. 119. E. B. t. 844.
 Hab. Waste and cultivated grounds, common.

CICHORIUM.

- C. Intybus*, Sm. Compend. p. 119. E. B. t. 539.
 Hab. Fields near Balbriggan; Dr. Scott. Little Island, county of Cork; Mr Drummond.

ARCTIUM.

- A. Lappa*, Sm. Compend. p. 120. E. B. t. 1228.
 Hab. Waste places and way sides, frequent.

SERRATULA.

- S. alpina*, Sm. Compend. p. 120. E. B. t. 599.
 Hab. Cliffs on Brandon, county of Kerry, 1804.

CARDUUS.

- C. nutans*, Sm. Compend. p. 120. E. B. t. 1112.
 Hab. Found on the side of the road between Gort and Corrofin, sparingly.
C. acanthoides, Sm. Compend. p. 120. E. B. t. 973.
 Hab. Neglected fields near Ball's-bridge.
C. tenuiflorus, Sm. Compend. p. 120. E. B. t. 412.
 Hab. Waste places and way sides, frequent.
C. marianus, Sm. Compend. p. 120. E. B. t. 976.
 Hab. Plentiful in the church-yard by the Ruins of Kilbarrick church.

CNICUS.

- C. lanceolatus*, Sm. Compend. p. 120. E. B. t. 107.
 Hab. Way sides and neglected fields, common.
 A variety with white flowers, abundant at the foot of Manree mountain, county of Mayo.
C. palustris, Sm. Compend. p. 120. E. B. t. 974 (*Carduus palustris*).
 Hab. Sides of ditches and moist meadows, common. Often found with white flowers.
C. arvensis, Sm. Compend. p. 121. E. B. t. 975 (*Carduus arvensis*).
 Hab. Fields and way sides.
C. eriophorus, Sm. Compend. p. 121. E. B. t. 386.
 Hab. Sandy grounds near Derry; John Nuttall, Esq.
C. pratensis, Sm. Compend. p. 121. E. B. t. 177.
 Hab. Moist boggy grounds in Glen Cree, county of Wicklow, and near Castle Connel, county of Limerick.

SYNGENESIA.—POLYGAMIA SUPERFLUA.

CARLINA.

- C. vulgaris*, Sm. Compend. p. 121. E. B. t. 1144.
 Hab. Dry hilly pastures and sandy commons. On Howth and at Portmarnock, plentiful.

BIDENS.

- B. cernua*, Sm. Compend. p. 121. E. B. t. 1114.
 Hab. Ditches between Shannon-harbour and Birr, plentifully. Common also in moist grounds in the county of Fermanagh, where the var. β . the *Coreopsis bidens*, Sp. Pl. 1281, also grows.

EUPATORIUM.

- E. cannabinum*, Sm. Compend. p. 121. E. B. t. 428.
 Hab. Banks of rivers and wet ditches, frequent.

II. POLYGAMIA SUPERFLUA.

TANACETUM.

- T. vulgare*, Sm. Compend. p. 122. E. B. t. 1229.
 Hab. Way sides and church-yards. By the old church at Howth, plentiful.

ARTEMISIA.

- A. maritima*, Sm. Compend. p. 122. E. B. t. 1706.
 Hab. On the Sutton side of Howth, and on the coast near Portran, plentiful.
A. Absinthium, Sm. Compend. p. 122. E. B. t. 1230.
 Hab. Waste places and way sides. By the old church at Howth, and other places near that village.
A. vulgaris, Sm. Compend. p. 122. E. B. t. 978.
 Hab. Waste places, common.

GNAPHALIUM.

- G. margaritaccum*, Sm. Compend. p. 123. E. B. t. 124. *Antennaria margaritacea*, Brown, Trans. Linn. Soc. XII. 122.
 Hab. On old mud walls at Cloghreen, Killarney; Dr. Wade. Near Bandon; Mr. Drummond. Old ditch banks near Milltown, county of Kerry.
G. dioicum, Sm. Compend. p. 123. E. B. t. 167. *Antennaria montana*, Brown.
 Hab. Sandy grounds at Portmarnock, and county of Clare near Limerick, abundant.

SYNGENESIA.—POLYGAMIA SUPERFLUA.

- G. sylvaticum*, Sm. Compend. p. 122. E. B. t. 913.
 Hab. Lettery mountain, and other places in Cunnamara, where it had been previously observed by Dr. Wade.
- G. rectum*, Sm. Compend. p. 123. E. B. t. 124.
 Hab. Frequent in high pastures in the county of Cork; Mr. Drummond. Plentiful on Bartra Island and other places in the county of Mayo. This is considered by Dr. Hooker to be only a variety of *G. sylvaticum*, in which opinion I perfectly agree.
- G. uliginosum*, Sm. Compend. p. 123. E. B. t. 1194.
 Hab. Marshy grounds, frequent.
- G. minimum*, Sm. Compend. p. 123. E. B. t. 1157.
 Hab. Dry banks above the upper Dargle gate, and between Enniskerry and Lough Bray, plentiful.
- G. germanicum*, Sm. Compend. p. 123. E. B. t. 946.
 Hab. Dry fields and sandy places, frequent.

ERIGERON.

- E. acre*, Sm. Compend. p. 123. E. B. t. 1158.
 Hab. Outer side of the north wall, below the Custom-house.

TUSSILAGO.

- T. Farfara*, Sm. Compend. p. 124. E. B. t. 429.
 Hab. Moist ditch banks and clayey soils, very common.
- T. Petasites*, Sm. Compend. p. 124. E. B. t. 431 et 430 *T. hybrida*, according to Hooker.
 Hab. River sides and damp grounds, frequent.

SENECIO.

- S. vulgaris*, Sm. Compend. p. 124. E. B. t. 747.
 Hab. Waste grounds and fields, every where.
- S. viscosus*, Sm. Compend. p. 124. E. B. t. 32.
 Hab. Sandy fields near Killbarrick church and Howth, &c.
- S. sylvaticus*, Sm. Compend. p. 124. E. B. t. 748.
 Hab. Waste grounds near Cork; Mr. Drummond. On moory grounds at Tittour, near Roundwood, county of Wicklow.
- S. Jacobæa*, Sm. Compend. p. 124. E. B. t. 1130.
 Hab. Dry pastures and way sides.
- S. aquaticus*, Sm. Compend. p. 124. E. B. t. 1131.
 Hab. Marshy grounds, frequent.
- S. saracenicus*, Sm. Compend. p. 124. E. B. t. 2211.
 Hab. Woods at Bantry; Mr. Drummond.

ASTER.

- A. Tripolium*, Sm. Compend. p. 125. E. B. t. 87.
 Hab. Salt marshes. At Howth, Ringsend, Dunleary, &c.

SYNGENESIA.—POLYGAMIA SUPERFLUA.

SOLIDAGO.

- S. Virgaurea*, Sm. Compend. p. 125. E. B. t. 301.
 Hab. Woods and dry heaths. Plentiful in the Devil's Glen. The dwarf variety, *S. cambrica* of authors, on Mangerton mountain.

INULA.

- I. Helinium*, Sm. Compend. p. 125. E. B. t. 1546.
 Hab. At Calnafersy, county of Kerry, and on high ground between Milltown and Tralee; Dr. G. Clarke, who brought me a specimen.
I. dysenterica, Sm. Compend. p. 125. E. B. t. 1115.
 Hab. Moist grounds, by way sides, and in lanes. Very common in the county of Dublin.
I. crithmoides, Sm. Compend. p. 125. E. B. t. 68.
 Hab. Sea shore at Howth, south side, in muddy places.

BELLIS.

- B. peremis*, Sm. Compend. p. 125. E. B. t. 424.
 Hab. Pastures and lawns.

CHRYSANTHEMUM.

- C. Leucanthemum*, Sm. Compend. 126. E. B. t. 601.
 Hab. Dry fields and pastures, abundant.
C. segetum, Sm. Compend. p. 126. E. B. t. 540.
 Hab. Corn fields.

PYRETHRUM.

- P. Parthenium*, Sm. Compend. p. 126. E. B. t. 1231.
 Hab. Waste places near houses.
P. inodorum, Sm. Compend. p. 126. E. B. t. 676.
 Hab. Fields and way sides, and on dunghills, common.
P. maritimum, Sm. Compend. p. 126. E. B. t. 971.
 Hab. Rock Savage near Cork; Mr. Drummond. Sea shore near the foot of Brandon, county of Kerry.

MATRICARIA.

- M. Chamomilla*, Sm. Compend. p. 126. E. B. t. 1232
 Hab. Corn fields, county of Cork; Mr. Drummond.

ANTHEMIS.

- A. nobilis*, Sm. Compend. p. 126. E. B. t. 980.
 Hab. Common in the southern and western parts of the county of Cork; Mr. Drummond. Sandy common near Calnafersy, county of Kerry, and way sides near Killarney, in great abundance.

SYN.—POLYGAMIA FRUSTRANEA.—GYNANDRIA.—MONANDRIA.

A. *Cotula*, Sm. Compend. p. 126. E. B. t. 126.

Hab. Neglected fields and waste places. Fields near Ball's-bridge, &c.

ACHILLEA.

A. *Ptarmica*, Sm. Compend. p. 127. E. B. t. 757.

Hab. Moist meadows and pastures, frequent.

A. *Millefolium*, Sm. Compend. p. 127. E. B. t. 758.

Hab. Pastures, road sides, and tops of walls, common.

 POLYGAMIA FRUSTRANEA.

CENTAUREA.

C. *Jacea*, Sm. Compend. p. 127. E. B. t. 1678.

Hab. Near Belfast, rare; Mr. Templeton.

C. *nigra*, Sm. Compend. p. 127. E. B. t. 278.

Hab. Road sides and pastures every where.

C. *Cyanus*, Sm. Compend. p. 127. E. B. t. 277.

Hab. Corn fields, rather rare.

C. *Scabiosa*, Sm. Compend. p. 126. E. B. t. 56.

Hab. Dry banks and fields near Dublin, not uncommon. Banks of the Dodder, and bank near Chapelizod, &c.

C. *solstitialis*, Sm. Compend. p. 128. E. B. t. 243.

Hab. Discovered in a sandy field at Portmarnock in July 1821, By Doctor Charles Croker, then one of my botanical pupils. As there are fields of Lucern near to where this plant was found, perhaps the seed of it may have been introduced along with the seed of that plant.

 XX. GYNANDRIA.

 I MONANDRIA.

ORCHIS.

O. *Morio*, Sm. Compend. p. 129. E. B. t. 2059.

Hab. Pastures and moist meadows, frequent.

GYNANDRIA.—MONANDRIA.

- O. mascula*, Sm. Compend. p. 129. E. B. t. 631.
 Hab. Woods, frequent. Plentiful at Woodlands.
O. pyramidalis, Sm. Compend. p. 129. E. B. t. 110.
 Hab. Moist fields near Dublin, frequent.
O. latifolia, Sm. Compend. p. 129. E. B. t. 2308.
 Hab. Marshes and moist meadows, common.
 A variety with flesh coloured flowers is plentiful in salt marshes near Beldoyle, and in a marsh near Kingstown.
O. maculata, Sm. Compend. p. 129. E. B. t. 632.
 Hab. Pastures and moory places, very common.

GYMNADENIA.

- G. conopsea*, Sm. Compend. p. 129. E. B. t. 10 (*Orchis conopsea*).
 Hab. Moist banks and pastures, not unfrequent. Plentiful in Kelly's Glen, and in a marsh as you enter Enniskerry from the Scalp, right hand side of the road.

HABENARIA.

- H. viridis*, Brown in Hort. Kewensis, ed. 2. v. 5. p. 192. Hook in Curt. Fl. Lond. ed. 2. with a fig. and E. B. t. 54, (*Satyrium viride*).
 Hab. Dry hilly pastures, not uncommon. Plentiful in meadows east side of Howth, and in Kelly's Glen, above the gap of Ballinascorney.
H. albida, Brown in Hort. Kewensis, ed. 2. v. 5. p. 193 and E. B. t. 505.
 Hab. Mountainous pastures. At Luggy-law near the lake; Mr. Templeton and Mr. Underwood. In the Queen's county, between Stradbally and Cullenagh; Mr. Bradburry.
H. bifolia, E. B. t. 22 (*Orchis bifolia*). Brown in Hort. Kewensis, ed. 2. v. 5. p. 193. Hook. in Curt. Fl. Lond. ed. 2 with a figure.
 Hab. Moist grounds and marshy places among the mountains, county of Wicklow, and bogs in the Queen's county, &c.

OPHRYS.

- O. apifera*, Sm. Compend. p. 130. E. B. t. 383.
 Hab. Portmarnock sands, near the south end, abundantly. First found there by John Rogers, Esq. and sparingly near Enniskerry, on dry banks by the marsh, near the bridge.

NEOTTIA.

- N. spiralis*, Brown in Hort. Kewensis, ed. 2. v. 5. p. Sm. Compend. p. 130. E. B. t. 541 (*Ophrys spiralis*).
 Hab. Near Cork; Rev. Wm. Hincks. Found occasionally on Bray common.

MONCECIA.—MONANDRIA.

LISTERA.

- L. ovata*, Brown in Hort. Kewensis, ed. 2. v. 5. p. 201. Sm. Compend. p. 130. E. B. t. 1548 (*Ophrys ovata*).
- Hab. Woods and moist grounds, frequent. Woods at Howth castle and Powerscourt; also at Portmarnock sands in open situations.
- L. cordata*, Brown in Hort. Kewensis, ed. 2. v. 5. p. 201, and Sm. Compend. p. 130. E. B. t. 385 (*Ophrys cordata*).
- Hab. Moist banks among mosses, at Lough Bray above the lower lake; Dr. Stokes. County Donegal; Robert Brown, Esq. Near Cullenagh, Queen's county; Mr. Bradburry.

EPIPACTIS.

- E. latifolia*, Brown in Hort. Kewensis, ed. 2. v. 5. p. 202 and Sm. Compend. p. 130. E. B. t. 269. (*Serapias latifolia*).
- Hab. Woods and sandy commons. In woods at Sans Souci, near Bray, and in Portmarnock sands, &c.
- E. palustris*, Brown in Hort. Kewensis, ed. 2. v. 5. p. 202. Hook. in Fl. Lond. with a fig. Sm. Compend. p. 130 and E. B. t. 270 (*Serapias palustris*).
- Hab. Marshy grounds. Marsh at Enniskerry, &c.
- E. pallens*, Brown in Hort. Kewensis, ed. v. 5. p. 202. Hooker in Fl. Lond. with a figure, and E. B. t. 271 (*Serapias grandiflora*).
- Hab. Woods at Glengariff near Bantry.

MALAXIS.

- M. paludosa*, Brown in Hort. Kewensis, ed. 2. v. 5. p. 208. Sm. Compend. p. 131 and E. B. t. 72.
- Hab. Tittour and Sugar-loaf mountain; John Nuttall, Esq. In marshy places above Powerscourt Waterfall. Bog near Priest's Leap, Kenmare side, &c.

 XXI. MONCECIA.

I. MONANDRIA.

ZANICHELLIA.

- Z. palustris*. Sm. Compend. p. 129. E. B. t. 1844.
- Hab. Ditches and stagnant waters. Ditches at Sandymount, &c.

MONŒCIA.—DIANDRIA.—TRIANDRIA.

II. DIANDRIA.

CALLITRICHE.

C. aquatica, Sm. Compend. p. 2. E. B. t. 722 (*C. verna* and *C. autumnalis*).

Hab. Ditches, ponds, and slow streams, abundant.

ZOSTERA.

Z. marina, Sm. Compend. p. 2. E. B. t. 467. Hook. in Fl. Lond. with a figure.

Hab. Marine ditches and creeks, and thrown up by the tide on the sea shore.

III. TRIANDRIA.

TYPHA.

T. latifolia, Sm. Compend. p. 134. E. B. t. 1455.

Hab. Ballyphehane bog near Cork; Mr. Drummond. Pond in the Phoenix-park; Mr. Underwood.

T. minor, Wild. sp. Pl. vol. 4. p. 197. *Typha angustifolia*, sp. pl. 1378.

Hab. Lake at Sandymount, in company with Mr. Underwood. Smaller in all its parts than *Typha angustifolia*, and different from *T. minor* of E. B. which answers to the description of *T. minima* of Willdenow.

SPARGANIUM.

S. ramosum, Sm. Compend. p. 135. E. B. t. 744.

Hab. Ditches and banks of lakes. Ditches near the College Botanic Garden, by the side of the Rock-road, and ditch by the banks of the Grand Canal, between Macartney-bridge and Donnybrook-bridge.

S. simplex, Sm. Compend. p. 135. E. B. t. 745.

Hab. Ballyphehane bog; Mr. Drummond. Bog of Curragha, county of Dublin.

S. natans, Sm. Compend. p. 135. E. B. t. 273.

Hab. Marsh on the hill of Howth near the top. Plentiful in Cunnamara.

CAREX.

C. dioica, Sm. Compend. p. 135. E. B. t. 543.

Hab. Bogs not unfrequent. Marsh on the hill of Howth. Very plentiful in Cunnamara.

C. Davalliana, Sm. Compend. p. 135. E. B. t. 2123.

Hab. Bogs near Belfast; Mr. Templeton.

MONECIA.—TRIANDRIA.

- C. pulicaris*, Sm. Compend. p. 135. E. B. t. 1051.
 Hab. Bogs, common.
- C. stellulata*, Sm. Compend. p. 135. E. B. t. 806.
 Hab. Bogs, common.
- C. ovalis*, Sm. Compend. p. 135. E. B. t. 306.
 Hab. Bogs, marshy places, and ditch banks, frequent.
- C. remota*, Sm. Compend. p. E. B. t. 832.
 Hab. Woods and shady moist places, frequent.
- C. axillaris*, Sm. Compend. p. 136. E. B. t. 993.
 Hab. Ballyphehane bog near Cork; Mr. Drummond.
- C. arenaria*, Sm. Compend. p. 136. E. B. t. 928.
 Hab. Sandy sea shores, frequent, where it is of great service in binding the sand by its creeping roots. Plentiful on the sand hills near Beldoyle and Portmarnock.
- C. intermedia*, Sm. Compend. p. 136. E. B. t. 2042.
 Hab. Plentiful in moist meadows, east side of the hill of Howth, and near Cullenagh, Queen's county, in boggy grounds.
- C. divisa*, Sm. Compend. p. 136. E. B. t. 1096.
 Hab. Salt marshes at Aghris, Cunnamara; Dr. Wade.
- C. muricata*, Sm. Compend. p. 136. E. B. t. 1097.
 Hab. Dry ditches near the Cork Botanic Garden; Mr. Drummond. Bog of Curragher; Dr. Wade and Mr Underwood. On ditch banks near Cahir.
- C. vulpina*, Sm. Compend. p. 136. E. B. t. 307.
 Hab. Sides of wet ditches and marshy grounds, frequent.
- C. paniculata*, Sm. Compend. p. 136. E. B. t. 1064.
 Hab. On banks of rivers near Clones, county of Fermanagh; Dr. Scott. On Glenagh mountains, Killarney, and in Ballyphehane bog near Cork. In Powerscourt woods, and at Tittour near Roundwood, abundant.
- C. pendula*. Sm. Compend. p. 137. E. B. t. 2315.
 Hab. Woods, moist places, and ditch banks. Ditch bank east side of the Royal canal, between Dublin and Glassnevin. In Powerscourt woods near the Cherry Orchard.
- C. strigosa*, Sm. Compend. p. 137. E. B. t. 994.
 Hab. Woods. In Woodlands, and at the Dargle, plentiful.
- C. sylvatica*. Sm. Compend. p. 137. E. B. t. 995.
 Hab. Woods, common.
- C. Pseudo-cyperus*, Sm. Compend. p. 137. E. B. t. 242.
 Hab. In Sir Robert Staples's Woods, Queen's county, in marshy spots. Marshy ground by the river Lee, Mr. Drummond.
- C. pallescens*, Sm. Compend. p. 138. E. B. t. 2185.
 Hab. Marshy places not unfrequent. Kelly's Glen, and moist places near Cullenagh.
- C. flava*, Sm. Compend. p. 138. E. B. t. 1294.
 β. smaller, fruit less recurved. Hooker. *C. Æderi*, Sm. Compend. p. 138. E. B. t. 1773.
- Hab. Bogs, not uncommon, both α and β.

MONCECIA.—TRIANDRIA.

- C. fulva*, Sm. Compend. p. 138. E. B. t. 1295.
 Hab. On a mountain called Sugar-loaf, north side of Bantry-bay. In marshes by the side of the road as you ascend Priest's Leap mountain, going from Bantry to Kenmare, and in many places in the county of Kerry.
C. extensa, Sm. Compend p. 138. E. B. t. 833.
- Hab. Salt marshes. Plentiful at Portmarnock, below the house of Ballylickey, Bantry-bay, and near Cahil, Cunnamara.
C. distans, Sm. Compend. p. 138. E. B. t. 1234.
- Hab. Salt marshes. Plentiful near Sandymount, on the strand near Beldoyle, and at Portmarnock.
C. binervis Sm. Compend. p. 138. E. B. t. 1235.
- Hab. Dry Heaths. Plentiful on Howth. A much larger plant than *C. distans*, which is only found near the sea side.
C. præcox, Sm. Compend. p. 138. E. B. t. 1099.
- Hab. Dry pastures. Bank near the bridge of Enniskerry.
C. pilulifera, Sm. Compend. p. 138. E. B. t. 885.
- Hab. Moors and heaths, not uncommon. Plentiful on Howth.
C. panicea, Sm. Compend. p. 139. E. B. t. 1505.
- Hab. Marshy grounds, common.
C. recurva, Sm. Compend. p. 139. E. B. t. 1506.
- Hab. Moist fields and moory grounds, frequent.
C. cæspitosa, Sm. Compend. p. 139. E. B. t. 1507.
- Hab. Marshes and wet pastures, frequent. α . leaves narrow, erect, somewhat flaccid, spikes subcylindrical; calyx generally shorter than the fruit.
 E. B. t. 1507.
 β . leaves broader, recurved, rigid; spikes oblong, calyx generally as long as the fruit.
C. rigida, Sm. Compend. p. 139. E. B. t. 2047.
- Hab. α . Marshes, frequent.
 β . On Galtymore and Magillycuddy's-reeks,
C. stricta, Sm. Compend. p. 139. E. B. t. 914.
- Hab. Foot of Turk mountain, Killarney, on the margin of the lake. Ballypnehane bog; Mr. Drummond.
C. acuta, Sm. Compend. p. 139. E. B. t. 580.
- Hab. Moist meadows and watery places. Marshes on Howth; Mr. Underwood.
C. paludosa, Sm. Compend. p. 139. E. B. t. 807.
- Hab. Marshy spots in Sir Robert Staples's Woods, Queen's county.
C. riparia, Sm. Compend. p. 139. E. B. t. 579.
- Hab. Sides of ditches and rivers, common.
C. levigata, Sm. Compend. p. 139. E. B. t. 1387.
- Hab. Marshes near Ballylickey, Bantry, where it was found by the late Miss Hutchins.
C. vesicaria, Sm. Compend. p. 139. E. B. t. 779.
- Hab. Bogs and marshes. Marsh near the summit of Howth, bog of Curragha and bogs near Cullenagh.

MONŒCIA.—TETRANDRIA.

- C. ampullacea*, Sm. Compend. p. 139. E. B. t. 780.
 Hab. In marshy grounds in the county of Fermanagh; Dr. Scott. Plentiful in bogs in the Queen's county, near Cullenagh.
C. hirta, Sm. Compend. p. 140. E. B. t. 685.
 Hab. Wet pastures and meadows, common.
C. filiformis, Sm. Compend. p. 140. E. B. t. 904.
 Hab. Ballyphehane bog near Cork; Mr. Drummond.

ERIOCAULON.

- E. septangulare*, Sm. Compend. p. 140. E. B. t. 733.
 Hab. Very plentiful in many of the small lakes in Cunnamara, where it had previously been observed by Dr. Wade. In small ditches within four miles of Galway on the Oughterard road, and in several small lakes between Newport and Mount Nephin, county of Mayo.

IV. TETRANDRIA.

LITTORELLA.

- L. lacustris*, Sm. Compend. p. 140. E. B. t. 468.
 Hab. Margins of mountain lakes, frequent. At Lough Bray, Luggj-law, and Lough Dan, county of Wicklow. In several small lakes in the Gap of Dunloe, county of Kerry, and Ballynahinch lake, Cunnamara.

ALNUS.

- A. glutinosa*, Sm. Compend. p. 140. E. B. t. 1508 (*Betula Alnus*).
 Hab. Banks of the Lee; Mr. Drummond.

URTICA.

- U. pilulifera*, Sm. Compend. p. 149. E. B. t. 140.
 Heb. Specimens of this plant were sent to me from Ballylickey, by Miss Hutchins, which were found by that lady in a wild state.
U. urens, Sm. Compend. p. 130. E. B. t. 1236.
 Hab. Dughills and waste places, abundant.
U. dioica, Sm. Compend. p. 140. E. B. t. 1750.
 Hab. Waste places, and hedge banks, abundant.

MONCECIA.—PENTANDRIA.—POLYANDRIA.

V. PENTANDRIA.

XANTHIUM.

X. strumarium, Sm. Compend. p. 141. E. B. t. 2544.

- Hab. Said to have been found near Listowel, county of Kerry. Vide, Smith's history of that county. As I found many of the plants he noticed in the places mentioned by him, I have little doubt of his being also correct in this instance; although I did not find it in passing through that part of the country.

VI. POLYANDRIA.

CERATOPHYLLUM.

C. demersum, Sm. Compend. p. 141. E. B. t. 947.

- Hab. Pools near the bridge of Navan; Dr. Scott. Lake at Ballynahinch, county of Down.

MYRIOPHYLLUM.

M. verticillatum, Sm. Compend. p. 141. E. B. t. 218.

- Hab. Ballyphehane bog near Cork; Mr. Drummond. In Cunnamara; Dr. Wade.
M. spicatum, Sm. Compend. p. 141. E. B. t. 83.
 Hab. Ditches and stagnant waters. Common in the Mill-pond at Mr. Haig's Distillery near the College Botanic Garden.

SAGITTARIA.

S. sagittifolia, Sm. Compend. p. 141. E. B. t. 84.

- Hab. At the mouth of a small river opening into Lough Ern, and in the Bann river, county of Fermanagh; Dr. Scott. Near Dungannon; Dr. James Shuter. In drains on the banks of the Shannon near Portumna bridge, county of Tipperary.

ARUM.

A. maculatum, Sm. Compend. p. 141. E. B. t. 1298.

- Hab. Shady places in the Phoenix-park. Road between Dundrum and the Scalp, and many other places in the county of Dublin.

POTERIUM.

P. sanguisorba, Sm. Compend. p. 141. E. B. t. 860.

- Hab. Dry banks and pastures, occasionally. Bank as you enter Enniskerry. Banks of the Dodder near Clonskeagh.

MONÆCIA.—MONADELPHIA.

QUERCUS.

Q. Robur, Sm. Compend. p. 141. E. B. t. 1342.

Hab. Woods.

CASTANEA.

C. vulgaris, Sm. Compend. p. 142. E. B. t. 886 (*Fagus Castanea*).

Hab. Plantations, but scarcely indigenous. There are fine specimens of it in the Demesne of Muckruss, near Killarney.

F. sylvatica, Sm. Compend. p. 142. E. B. t. 1846.

Hab. Woods and plantations, frequent.

CARPINUS.

C. Betulus, Sm. Compend. p. 142. E. B. t. 2032.

Hab. Woods and plantations, frequent. There are large flowering specimens of this tree in Woodlands, county of Dublin. It is often used for hedges.

CORYLUS.

C. Avellana, Sm. Compend. p. 142. E. B. t. 723.

Hab. Woods and thickets.

 VII. MONADELPHIA.

PINUS.

P. sylvestris, Sm. Compend. p. 142. E. B. t. 2460.

Hab. West of Ireland. I saw a solitary tree near the foot of Mount Nephin, which I was told was the only remains of the pine Forests in that quarter. This appears to have been a general tree in Ireland, as large trunks are often dug up from a great depth in most of the bogs throughout the country. The late Marquis of Sligo dug up as much of it in the neighbourhood of Westport as served for the timber of a large range of offices. It is dug up in quantities in the bog of Allan, and sold in Dublin under the name of bogwood. In the Queen's county they twist it into ropes.

DICECIA.—DIANDRIA.

XXII. DICECIA.

I. DIANDRIA.

SALIX.

- S. purpurea*, Sm. Compend. p. 144. E. B. t. 1388.
 Hab. Sea side, county of Mayo.
- S. Helix*, Sm. Compend. p. 144. E. B. t. 1343.
 Hab. Near Carrigaline, county of Cork; Mr. Drummond.
- S. rubra*, Sm. Compend. p. 145. E. B. t. 1145.
 Hab. Near Fermoy; Mr. Drummond. Ozier grounds near Dublin.
- S. Sm.* Compend. p. 153. E. B. t. 1435.
S. amygdalina, Sm. Compend. p. 145. E. B. t. 1936.
 Hab. River sides near Castle-hide; Mr. Drummond.
- S. Russelliana*, Sm. Compend. p. 145. E. B. t. 1808.
 Hab. Plantations near Kilkeel, county of Down. A large quick growing tree; the most so of the timber willows; bark esteemed good for tanning.
- S. fragilis*, Sm. Compend. p. 145. E. B. t. 1807.
 Hab. Plantations.
- S. pentandra*, Sm. Compend. p. 145. E. B. t. 1805.
 Hab. In a natural wood near Blarney, county of Cork; Mr. Drummond. The most ornamental of the willows.
- S. petiolaris*, Sm. Compend. p. 145. E. B. t. 1147.
 Hab. Hedges near Fermoy; Mr. Drummond.
- S. vitellina*, Sm. Compend. p. 146. E. B. t. 1389.
 Hab. Ozier grounds.
- S. tenuifolia*, Sm. Compend. p. 146. E. B. t. 2186.
 Hab. Near Carrigaline; Mr. Drummond.
- S. herbacea*, Sm. Compend. p. 146. E. B. t. 1907.
 Hab. Summits of mountains, such as, Tomlagee and Lugnaquilla two of the Wicklow mountains.
- S. repens*, Sm. Compend. p. 147. E. B. t. 183.
 Hab. Tittour, county of Wicklow; Mr. Nuttall.
- S. adscendens*, Sm. Compend. p. 147. E. B. t. 1962.
 Hab. Heath near Scibereen; Mr. Drummond.
- S. fusca*, Sm. Compend. p. 147. E. B. t. 1960.
 Hab. Turfy and heathy mountains in Cunnamara, as has also been remarked by Dr. Wade. Heaths near Scibereen; Mr. Drummond.
- S. argentea*, Sm. Compend. p. 147. E. B. t. 1364.
 Hab. Sands of Portmarnock, abundant.

DICECIA.—TRIANDRIA.—TETRANDRIA.

- S. cinerea*, Sm. Compend. p. 147. E. B. t. 1397 and 1437. *S. aquatica* and 1402 *Salix Oleifolia*.
- Hab. Banks of rivers and moist woods. In the county of Wicklow, frequent. I am inclined to think with Dr. Hooker, that all these are only varieties of the same species.
- S. aurita*, Sm. Compend. p. 148. E. B. t. 1487.
- Hab. Heaths and boggy grounds, frequent. Plentiful in the county of Wicklow; perhaps the most common species of willow in Ireland.
- S. cotinifolia*, Sm. Compend. p. 148. E. B. t. 1487.
- Hab. Woods and bushy places near Cork; frequent; Mr. Drummond.
- S. caprea*, Sm. Compend. p. 148. E. B. t. 1403.
- Hab. Woods and hedge banks in the county of Wicklow, frequent. Plentiful near Cork; Mr Drummond.
- S. acuminata*, Sm. Compend. p. 148. E. B. t. 1434.
- Hab. Woods and bushy places near Cork, Mr. Drummond. In the county of Wicklow, frequent in hedge rows.
- S. stipularis*, Sm. Compend. p. 148. E. B. t. 1214.
- Hab. Ozier grounds; Mr. Drummond.
- S. mollissima*, Sm. Compend. p. 148. E. B. t. 1509.
- Hab. County of Wicklow, in hedges, and by the mill-stream near the College Botanic Garden.
- S. viminalis*, Sm. Compend. p. 148. E. B. t. 1898.
- Hab. Ditch banks and ozier grounds.
- S. alba*, Sm. Compend. p. 149. E. B. t. 2430, and t. 2431 (*S. cœrulea*).
- Hab. Woods, frequent.

II. TRIANDRIA.

EMPETRUM.

- E. nigrum*, Sm. Compend. p. 149. E. B. t. 526.
- Hab. Mountainous heaths. Plentiful on the Dublin mountains.

III. TETRANDRIA.

MYRICA.

- M. Gale*, Sm. Compend. p. 149, E. B. t. 562.
- Hab. Bogs, most abundant.

DICECIA.—PENTANDRIA.—OCTANDRIA.—ENNEANDRIA.

IV. PENTANDRIA.

HUMULUS.

H. Lupulus, Sm. Compend. p. 149. E. B. t. 427.

Hab. Hedges. In hedges between Cullenagh and Stradbally, and near Nenagh. In the south Isles of Arran among the limestone rocks, producing excellent hops in October, 1805.

V. OCTANDRIA.

POPULUS.

P. alba, Sm. Compend. p. 150. E. B. t. 1618.

Hab. Natural woods near Blarney, county of Cork; Mr. Drummond.

P. tremula (Aspen), Sm. Compend. p. 150. E. B. t. 1909.

Hab. Natural woods near Blarney; Mr. Drummond.

P. nigra, Sm. Compend. p. 150. E. B. t. 1910.

Hab. Common in plantations. Scarcely indigenous.

RHODIOLA.

R. rosea, Sm. Compend. p. 150. E. B. t. 508.

Hab. Cliffs on Hungey hill; Miss Hutchins. Island of Rathlin; Mr. Templeton. Cliffs on Magillycuddy's-reeks and on Brandon mountain, county of Kerry; also in the largest south Island of Arran.

VI. ENNEANDRIA.

MERCURIALIS.

M. annua, Sm. Compend. p. 150. E. B. t. 559.

Hab. Waste places near Dublin, not uncommon.

HYDROCHARIS.

H. Morsus-ranæ, Sm. Compend. p. 150. E. B. t. 808.

Hab. In bog pits near Balruddery; Dr. Scott. Bog of Curraglia, and in drains in a marsh, by the river Fergus, a little above the bridge at Ennis.

POLYGAMIA.—MONÆCIA.

VII. MONADELPHIA.

JUNIPERUS.

J. communis, Sm. Compend. p. 150. E. B. t. 1100.

Hab. Woods and high mountains. The tall upright or common Juniper, in woods about Killarney. The dwarf mountain Juniper, creeps over rocks on high mountains, both in the south and north.

TAXUS.

T. baccata, Sm. Compend. p. 151. E. B. t. 746.

Hab. Mountainous woods, &c. The famous Yew Tree, near Dunmanway was still in existence in July 1815, but in a very decayed state; it measured 15 feet in circumference at three feet from the ground. There are fine specimens of the yew in the Island of Innisfallen, lower lake of Killarney. There is a variety of the Yew, not very uncommon in plantations or shrubberies in this country, known by the name of Florencecourt yew, or Irish yew, with branches erect like those of the cypress, and with leaves of a much darker green than the common. The drupe or berry is also of a different form from those of the common Yew; it has no where been found in a wild state, but was first observed at Florencecourt, the seat of Lord Enniskillen.

 XXIII. POLYGAMIA.

I. MONÆCIA.

ATRIPLEX.

A. portulacoides, Sm. Compend. p. 151. E. B. t. 261.

Hab. Sea shores in muddy places. Plentiful on the shores at Howth, immediately below Mr. Hannington's house.

A. laciniata, Sm. Compend. p. 151. E. B. t. 165.

Hab. On the shore at Knockingen near Balbriggan; Dr. Scott. Plentiful on the western coast, particularly on a small island in the Bay of Sligo opposite Cummin.

CRYPTOGAMIA.—FILICIS.

- A. patula*, Sm. Compend. p. 151. E. B. t. 936.
 Hab. Sandy sea shores, cultivated grounds, and waste places, frequent.
A. angustifolia, Sm. Compend. p. 151. E. B. t. 1774.
 Hab. Found in the same situations as the last.
A. erecta, Sm. Compend. p. 151. E. B. t. 2223.
 Hab. Sea shores; Mr. Drummond.
A. pedunculata, Sm. Compend. p. 151. E. B. t. 638.
 Hab. Salt water muddy marshes. Cushtrower bay near Ballynahinch, Cunnamara, sparingly; Dr. Wade.
A. littoralis, Sm. Compend. p. 151. E. B. t. 708.
 Hab. In muddy soil at the Sutton side of Howth; Dr. Wade and Mr. Underwood.



XXIV. CRYPTOGRAMIA.

FILICES.

EQUISETUM.

- E. sylvaticum*, Sm. Compend. p. 154. E. B. t. 1874.
 Hab. Ditch banks near Roundwood, county of Wicklow.
E. arvense, Sm. Compend. p. 154. E. B. t. 2020.
 Hab. Moist fields.
E. palustre, Sm. Compend. p. 154. E. B. t. 2021.
 Hab. Ditches and wet boggy places, frequent.
E. fluviale, Sm. Compend. p. 154. E. B. t. 2022.
 Hab. Shady marshes and edges of stagnant waters, frequent.
E. limosum, Sm. Compend. p. 154. E. B. t. 929.
 Hab. Lakes and ditches, frequent.
E. hyemale, Sm. Compend. p. 154. E. B. t. 915.
 Hab. Shady woods. Plentiful at Woodlands and at Powerscourt.
E. variegatum, Sm. Compend. p. 154. E. B. t. 1987.
 Hab. Portmarnock-sands, where it was first found by Dr. Taylor.

OPHIOGLOSSUM.

- O. vulgatum*, Sm. Compend. p. 154. E. B. t. 108.
 Hab. Moist pastures. Plentiful on Howth.

BOTRYCHIUM.

- B. Lunaria*, Sm. Compend. p. 155. E. B. t. 318.
 Hab. Mountain pastures. Plentiful in Kelly's Glen, county of Dublin.

CRYPTOGAMIA.—FILICES.

OSMUNDA:

O. regalis, Sm. Compend. p. 155. E. B. t. 209.

- Hab. Boggy places, generally near water. Plentiful by the lake at the Seven Churches, and sparingly in Kelly's Glen. Very common about Killarney.

LYCOPODIUM.

L. clavatum, Sm. Compend. p. 155. E. B. t. 224.

- Hab. Mountainous heaths. Plentiful on the Dublin mountains, &c.

L. Selaginoides, Sm. Compend. p. 155. E. B. t. 1148.

- Hab. Boggy places by the side of the Dublin and other mountains, frequent.

L. Selago, Sm. Compend. p. 155. E. B. t. 233.

- Hab. Mountains, frequent.

L. alpinum, Sm. Compend. p. 155. E. B. t. 234.

- Hab. Barnesmore mountains near Donegal, and mountains of Mourne, county of Down.

POLYPODIUM.

P. vulgare, Sm. Compend. p. 155. E. B. t. 1149.

- Hab. Walls, and by the roots of trees in shady places. A beautiful variety with fronds mostly bipinnatifid, found on a dry bank in the Dargle woods, and in the south Isles of Arran. It nearly resembles the variety called *Poly-podium cambricum* by some authors.

P. Phegopteris, Sm. Compend. p. 155. E. B. t. 2224.

- Hab. Shady moist rocks. By the side of Powerscourt waterfall, sparingly.

P. Dryopteris, Sm. Compend. p. 155. E. B. t. 616.

- Hab. Sides of mountains, in stony places. Foot of the Mourne mountains near Tullamore Park; also on Turk mountain, Killarney, and Manturk, Cunnamara, where it had been previously noticed Dr. Wade.

ASPIDIUM,

A. Thelypteris, Sm. Compend. p. 156. E. B. t. 1018.

- Hab. Marshes in Glencree, county of Wicklow, near the Copse-wood. In marshy grounds between Muckruss-house and the mines, and in a marsh by the river Fergus a little above the bridge of Eunis, &c.

A. Oreopteris, Sm. Compend. p. 156. E. B. t. 1019.

- Hab. On moist banks in Powerscourt Deer-park, near the banqueting-house. On Mangerton mountain, half way up in a marshy spot. Near Bantry; Mr. Drummond.

A. Filix mas, Sm. Compend. p. 156. E. B. t. 1458.

- Hab. Woods and shady banks, frequent.

A. aculeatum, Sm. Compend. p. 156. E. B. t. 1502.

- Hab. Woods and dry ditch banks, common.

CRYPTOGAMIA—FILICES.

- A. lobatum*, Sm. Compend. p. 156. E. B. t. 1563.
 Hab. Collin-glen near Belfast; John Templeton, Esq.
A. Filix fœmina, Sm. Compend. p. 156. E. B. t. 1459.
 Hab. Woods and ditch banks.
A. spinulosum, Sm. Compend. p. 156. E. B. t. 1460.
 Hab. Dry banks near the banquetting-house at Powerscourt Waterfall. It appears to me to be sufficiently distinct from *A. dilatatum*.
A. dilatatum, Sm. Compend. p. 156. E. B. t. 1461.
 Hab. Woods and shady places, frequent.

ASPLENIUM.

- A. Trichomanes*, Sm. Compend. p. 157. E. B. t. 576.
 Hab. Rocks and walls, common.
A. viride, Sm. Compend. p. 157. E. B. t. 2257.
 Hab. Crevices of rocks in mountainous places. Rocks on Turk mountain, Killarney.
A. marinum, Sm. Compend. p. 157. E. B. t. 392.
 Hab. Rocks by the sea side, on the Sutton side of Howth and other similar situations.
A. Ruta muraria, Sm. Compend. p. 157. E. B. t. 150.
 Hab. Walls and fissures of rocks, frequent.
A. Adiantum nigrum, Sm. Compend. p. 157. Et Bt t. 1950.
 Hab. Dry shady banks and fissures of rocks, frequent. A beautiful variety of this fern with leaves finely cut, grows on the limestone rocks at Muckruss.

SCOLOPENDRIUM.

- S. vulgare*, Sm. Compend. p. 157. E. B. t. 1150.
 Hab. Shady ditch banks, frequent.
S. Ceterach, Sm. Compend. p. 157. E. B. t. 1244. Grammites Ceterach, Willdenow.
 Hab. Old walls and limestone rocks. On the garden wall at the Observatory, where it was pointed out to me by Dr. Brinkley. Plentiful at the marble quarries and on walls near Kilkenny: also on the limestone rocks near Corofin, county of Clare.

BLECHNUM.

- B. boreale*, Sm. Compend. p. 157. E. B. t. 1159.
 Hab. Woods, heaths, &c. plentiful.

PTERIS.

- P. aquilina*, Sm. Compend. p. 158. E. B. t. 1679.
 Hab. Woods, heaths, and stony places, common.

CRYPTOGAMIA.—FILICES.

P. crispa, Sm. Compend. p. 158. E. B. t. 1160.

Hab. Rocky mountains in the North. Plentiful on the mountains of Mourne.

ADIANTUM.

A. Capillus Veneris, Sm. Compend. p. 158. E. B. t. 1564.

Hab. South isles of Arran, in crevices of limestone rocks, abundant.

CYATHEA.

C. fragilis, Sm. Compend. p. 158. E. B. t. 1587.

Hab. Rocks in mountainous situations in the south, abundant.

TRICHOMANES.

T. brevisetum, Sm. Compend. p. 158. *Hymenophyllum alatum*. E. B. t. 1417.

Hab. Shady, moist place near Powerscourt Waterfall, very sparingly. Hermitage Glen, county of Wicklow; John Nuttall Esq. First found in fructification on a moist bank near the Waterfall, between Turk and Mangerton mountains in October, 1805.

HYMENOPHYLLUM.

H. Tunbridgense, Sm. Compend. p. 158. E. B. t. 162.

Hab. Moist rocks, not unfrequent. On the large rocks under Powerscourt Waterfall.

PILULARIA.

P. globulifera, Sm. Compend. p. 159. E. B. t. 521.

Hab. In a sandy boggy situation near the Salmon Leap, Ballynahinch, Cunnamara; Dr. Wade.

ISOETES.

I. lacustris. Sm. Compend. p. 159. E. B. t. 1084.

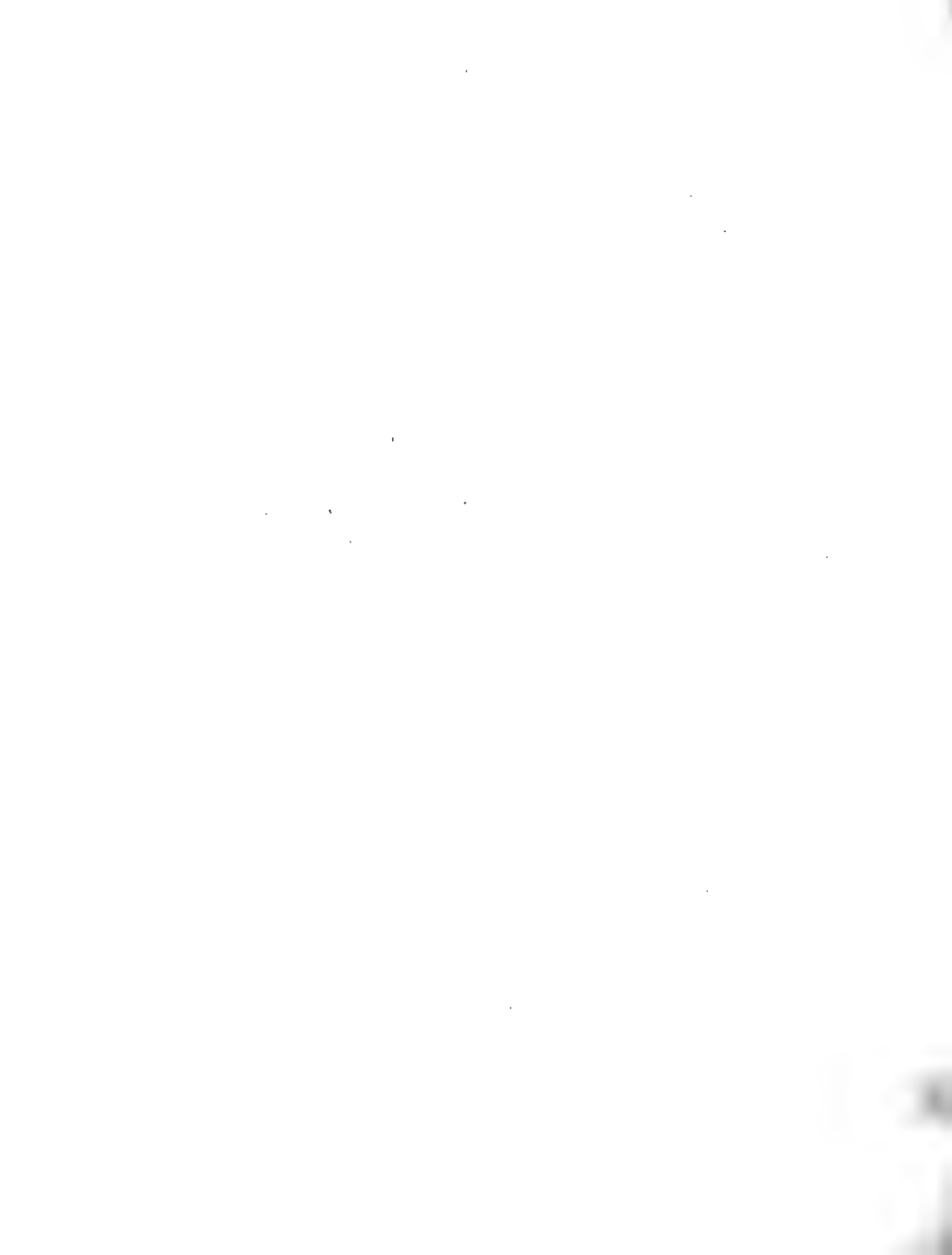
Hab. Lakes. Plentiful in Upper Lough-Bray, and in several lakes in Cunnamara, as noticed by Doctor Wade.





ADDENDA ET CORRIGENDA.

- Page, 106. Line, 10, for Don's arrangement, &c. read A Monograph on the Genus Saxifraga, in Tr. of Lin. Soc. vol. 13. p. 341, by David Don.
- ibid.* l. 14, for Smyth, read Smith.
- 108, last line, for Sot, read Scott.
- 109, l. 2, for lusianica, read lusitanica.
- 110, l. 26, for of hill, read hill of.
- 113, l. 30, for marches, read marshes.
- 114, l. 9, for anicia, read annua.
- 116, for ROTBOLLIA, read ROTTBOLLIA.
- 120, l. 21, for Brandon, read Bandon.
- 124, for HYOSYAMUS, read HYOSCYAMUS.
- ibid.* before HYOSCYAMUS, insert DATURA Stramonium, Sm. Compend. p. 29. E. B. t. 1288. Abundant about the river Lions; D. Wade.
- ibid.* l. 7, for Martello, read Mortella.
- ibid.* l. 17, for ERYTHREÆ, read ERYTHRÆA.
- 129, for PHELANDRUM, read PHELLANDRIUM.
- 135, after TRIGLOCHIN, insert COLCHICUM autumnale, Sm. Compend. p. 57. E. B. t. 133. Plentiful in moist meadows on the banks of the Shannon, below Limerick; Dr. Woods.
- 137, l. 14, for Caluna, read Calluna.
- 140, dele MONOGYNIA at top.
- ibid.* l. 23, for petioles, read Footstalks.
- 141, dele MONOGYNIA at top.
- 142, dele MONOGYNIA at top.
- ibid.* l. 7, for German read Germen.
- ibid.* l. 17, for offinis, read affinis.
- ibid.* l. 27, for German, read Germen.
- 143, dele MONOGYNIA at top.
- ibid.* l. 23, for Wahlenburg, read Wahlenberg.
- 147, last line but one, for insititea, read insititia.
- 148, l. 10, for aucuparia, read aucuparia.
- 149, dele PENTAGYNIA at top.
- 150, dele PENTAGYNIA at top.
- 153, dele PENTAGYNIA at top.
- 154, before MENTHA, insert VERBENA officinalis, Sm. Compend. p. 89. E. B. t. 767. Plentiful near Cork; Mr. Drummond. Very abundant by Way sides near Killarney, and sparingly at Killmacannick, county of Wicklow.
- 156, l. 6, for STAKY'S, read STACHYS.
- 166, dele HEXAGYNIA.—OCTAGYNIA at top.
- 172, l. 20, for Absinthium, read Absinthium.
- 183, before CARPINUS, insert BETULA alba, Sm. Compend. p. 142. E. B. t. 2198. Plentiful in Woods in Upland situations.
- 174, l. 6, for Helinium, read Helenium.
- ibid.* l. 15, for peremis, read perennis.
- 188, l. 20, for fluviatele, read fluviatile.



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ANTIQUITIES.

VOL. XIV.

22 AUGUST 1950

Observations on a passage in the Medea of Seneca ; and on the argument against the Evidence of Prophecy, drawn from it by Deistical writers. By the Rev. George Hamilton, Rector of Kilmogh, Diocese of Ossory.

Read January 22, 1821.

“ I AM persuaded that a prophecy, *literally fulfilled*, is a real miracle ; and that one such produced, to which no exception could justly be made, would go a great way in convincing all reasonable men. Let him (Mr. Woolaston) produce one prophecy as clear as is contained in Seneca the Tragedian, of the discovery of America and Greenland”—

“ Venient annis
Secula seris, quibus Oceanus
Vincula rerum laxet, et ingens
Pateat tellus, Tiphysque novos
Detegat orbes, nec sit terris
Ultima Thule.”—

COLLINS'S Scheme of Literal Prophecy considered.

This passage has attracted the notice of two distinguished Prelates of our Church, whose remarks have neither anticipated, nor (as I conceive) rendered unnecessary the object of the following Essay.

“ This prediction was made in the reign of Nero ; and, for more than 1400 years, might only pass for one of those sallies of imagination, in which poetry so much delights. But when at length, at the close of the fifteenth century, the discoveries of Columbus had realised this vision ; when that enterprising navigator had forced the barriers of the vast Atlantic ocean ; had loosened what the poet calls ‘ the chain of things ;’ and, in these latter ages, as was expressly signified, had set at liberty an immense continent, shut up before in the surrounding seas from the commerce and acquaintance of our world ; when this event, I say, so important and so unexpected came to pass, it might almost surprise one into a belief that this prediction was something more than a poetical fancy ; and that Heaven had indeed revealed to one favoured Spaniard what it had decreed in due time to accomplish by another.”—Bishop HURD on Prophecy, Ser. 4.

“ —A pretended prediction, which, for the propriety of its images, and the exactness of its completion, hath been compared and set in competition with the prophecies of Holy Writ.....‘ Now give me,’ says the Infidel,* ‘ a prophecy of your Bible which may be as clearly predictive of any event which you may choose to assign as the accomplishment, as these verses have by mere accident proved to be of the discovery of America by Christopher Columbus ; —give me such a prophecy from your Bible as I have produced from a Heathen poet, who yet was no prophet, nor claimed the character, and I will turn believer.’ We accept cheerfully this arrogant defiance. These verses predict nothing but what was evidently within the ken of human foresight, that men, being once

furnished with the means of discovery, would make discoveries; that, having ships, they would make voyages . . . and gain more knowledge of the surface of the globe. What peasant of Thessaly but might have uttered such prophecies as these, who saw the *Argo* bring her heroes home, and observed to what degree the avarice and curiosity of his countrymen were influenced by the wealth they brought home and the stories which they spread.”—HORSLEY’S Sermons, vol. 2.

Of these extracts, as replies to the Infidel, valeant quantum valere possunt. I hope to furnish a more decisive refutation by exhibiting proof, that Seneca founded the remarkable expressions in this passage upon a traditionary knowledge of a *transatlantic continent*, which had, at some remote period, been visited by navigators of the ancient world.

Our ideas of the progress of naval discoveries, and of navigation in general among the ancients, are too much confined to the Greeks and Romans, among whom the impossibility of navigating the Atlantic beyond the Straits of Gibraltar had passed into a proverb.* It was by the Phœnicians and their colonies, that the art of navigation was carried to its greatest perfection; and the spirit of commerce surmounted then as it does still, obstacles which opposed an effectual barrier to the march of conquest. Without referring to the traffic of Solomon with Tarshish, (a port which some place in Spain, others at Ceylon) we have very full proof that the Cape of Good Hope was doubled by a fleet, which left a port in the Red Sea;† and, after a voyage of three years, returned to Egypt by Gibraltar and the Mediterrenean. This fleet was navigated by

* Pindar Olymp. 3.—Nem. 3.—Id. 4.—Ismean 4.—Juvenal Sat. 14, 280.

† Herod. Lib. 4. chap. 42.

Phœnician seamen, and the circumstances which Herodotus records of the voyage leaves no doubt of its having actually been performed. The Carthaginians visited the Canary Islands,* which were the *Insulæ Beatæ* of the Romans; and here Ptolemy, the Geographer, placed his first meridian, as the most westerly land that was known. The *Periplus* of Hanno is an authentic record of the naval skill of this great commercial nation, and shews us, in connexion with other documents in existence, that the state of navigation among the ancients was not such as to render a voyage across the Atlantic utterly impracticable; nor so imperfect as to make it impossible for any who were accidentally driven on the American coast ever to have returned to Europe.

I shall next adduce the testimonies of ancient authors, as to the existence of a remote people westward of all the nations with whom they had ordinary intercourse, and of land far beyond the straits of Gibraltar. Homer mentions two nations or tribes of Ethiopians, one as far under the setting as the other was under the rising sun; Strabo, who gives the opinions of several writers on this passage, thinks that this division was occasioned by the Red Sea, and that the nations alluded to dwelt on its eastern and western shores; Herodotus also mentions, among the armies of Xerxes, tribes of Eastern and Western Ethiopians.† Yet, after all, it may be doubted whether a writer, who showed the accurate knowledge of geography which Homer did, would have thus described the residence of the borderers on the Red Sea in their geographical position with respect to Greece:—

*Αἰθίοπας, τοὶ διχθὰ δεδαΐαται ἑσχατοὶ ἀνδρῶν,
Οἱ μὲν δυσσομένε ὑπερίονος, οἱ δ' ἀνιόντος—*ODYSS. A.

* Plin. *Hist. Natur.* Lib. vi.—32.

† Lib. vii.

Virgil thus describes the residence of a remote people:—

————— Jacet extra sidera Tellus,
 Extra anni solisque vias, ubi cœlifer Atlas
 Axem humero torquet, stellis ardentibus aptum.—ÆN. VI. 795.

The *Variorum* edition has the following note upon this passage:—“Proferet imperium ultra tellurem si qua habitatur (namque de hoc ambigebant veteres) extra sidera majora et Planetas, qui intra Tropicos decurrunt, ultra την κεκαυμενην, nempe ανταξονα nobis. Sed quid dicemus de Atlante, qui uterque juxta Zodiacum situs, imo citra æquatorem. Vel igitur Poeta in honorem Augusti, sedem Atlantæ assignat nota remotiorem usque ad Æthiopas, quos M. Petronius Romanorum Dux subegit; ubi Herodoto, Pomponio, et Plinio sunt Atlantis populi. Vel respexit ad insulam Atlantis, cujus meminit Plato, in Timæo, et alii, novam silicet orbem a Columbo repperitam, Anno salutis 1592; quem tamen scivisse magis illos, quam novisse scribit Lipsius, &c. &c.”

The passage referred to in the above note, from Plato “in Timæo,” stands thus:—Νῆσον γὰρ πρὸ τοῦ στόματος εἶχεν, ὃ καλεῖτε (ὡς φατὲ ὑμεῖς) Ἡρακλέους στήλας. Ἡ δὲ νῆσος ἄμα Διὸς ἦν καὶ Ἀσίας μείζων, ἐξ ἧς ἐπιβατὸν ἐπὶ τὰς ἄλλας νήσους τοῖς τότε ἐγίνετο πορευομένοις· ἐκ δὲ τῶν νήσων ἐπὶ τὴν καταντικρὺ πᾶσαν ἤπειρον, τὴν περὶ τὸν ἀληθινὸν ἔκεινον πόντον.

Plato states moreover, that this island was covered by the sea in one night in consequence of an earthquake; and that the sea, being thereby filled with mud, was no longer navigable. Other writers enable us to account for the report of the submersion of this land; and all I need add to this passage is, that it contains the substance of information communicated to Solon while he was in Egypt. In the tract “De Mirabilibus auditis,” attributed to Aristotle, we

have the following passage:—'Εν τῇ θαλάσῃ τῇ ἕξω Ἑρακλείων στηλῶν, φασὶν ὑπὸ Καρχηδονίων νῆσον εὐρεθῆναι ἐρήμην, ἔχουσαν ὕλην τε παντοδαπὴν, καὶ ποταμούς πλωτοὺς, καὶ τοῖς λοιποῖς καρποῖς θαυμαστὴν, ἀπέχουσαν δὲ πλείονων ἡμερῶν ἐν ἣ ἐπιμισγομένων τῶν Καρχηδονίων πλεονάκις, διὰ τὴν εὐδαιμονίαν, ἐνίαν γε μὴν καὶ οἰκούνταν, τοὺς προεστῶτας τῶν Καρχηδονίων ἀπέϊκασθαι θανάτῳ ζημιούν τοὺς εἰς αὐτὴν πλευσομένους, καὶ τοὺς ἐνοικούντας πάντας ἀφανίσαι, ἵνα μὴ διαγγέλλωσι, μηδὲ πλῆθος συστραφῆν ἐπ' αὐτῶν ἐπὶ τὴν νῆσον κυρίας τύχης, καὶ τὴν τῶν Καρχηδονίων εὐδαιμονίαν ἀφέληται.

Diodorus Siculus. Lib. v. Κατὰ γὰρ τὴν Διβύην κεῖται μὲν πελαγία νῆσος, ἀξίολογος μὲν τῷ μεγέθει, κειμένη δὲ κατὰ τὸν ὠκεανὸν ἀπέχει δὲ πλοῦν ἀπὸ τῆς Διβύης ἡμερῶν πλείονων, κεκλιμένη πρὸς τὴν δύσιν, ἔχει δὲ χώραν καρποφόρον, πολλὴν μὲν ὄρεινὴν, οὐκ ὀλίγην δὲ πεδιάδα, κάλλει διαφέρουσαν· διαρρεαμένη γὰρ ποταμοῖς πλωτοῖς, ἐκ τούτων ἀρδεύεται Κατὰ μὲν οὖν τοὺς παλαιούς χρόνους ἀνεύρετος ἦν, διὰ τὸν ἀπὸ τῆς ὅλης οἰκουμένης ἐκτοπισμὸν, ὕστερον δ' εὐρέθη διὰ τοιαύτας αἰτίας. Φοίνικες ἐκ παλαιῶν χρόνων συνεχῶς πλέοντες κατ' ἐμπορίαν Ὅι δ' οὖν Φοίνικες διὰ τὰς προειρημένας αἰτίας ἐρευνῶντες τὴν ἐκτὸς τῶν στηλῶν παραλίαν, καὶ παρὰ τὴν Διβύην πλέοντες, ὑπ' ἀνέμων μεγάλων ἀπηνέχθησαν ἐπὶ πολὺν πλοῦν δι' ὠκεανοῦ. Χειμασθέντες δ' ἐπὶ πολλὰς ἡμέρας προσηνέχθησαν τῇ προειρημένη νήσῳ καὶ τὴν εὐδαιμονίαν αὐτῆς καὶ φύσιν κατοπτεύσαντες, ἅπασι γνώριμον ἐποίησαν. Διὸ καὶ Τυρρηνῶν θαλαττοκρατούντων, καὶ πέμπειν εἰς αὐτὴν ἀποικίαν ἐπιβαλομένων, διεκάλυσαν αὐτοὺς Καρχηδόνιοι, ἅμα μὲν ἐυλαβούμενοι μὴ διὰ τὴν ἀρετὴν τῆς νήσου πολλοὶ τῶν ἐκ τῆς Καρχηδόνος εἰς ἐκείνην τὴν νῆσον μεταστῶσιν, ἅμα δὲ πρὸς τὰ παράβολα τῆς τύχης κατασκευαζόμενοι καταφυγὴν, εἰ τι περὶ τὴν Καρχηδόνα ὀλοσχερὲς πταῖσμα συμβαίνοι.

From these latter passages, it is evident that the Carthaginians, who were acquainted with this transatlantic country, wished to conceal its situation from political motives; and thus we may account for the supposition, that this country was overwhelmed by the sea. For those who sought it being unable, from their imperfect know-

ledge of the art of navigation, to discover it, imagined it lost in the ocean ; while those, who thought it for their interest that it should be concealed, did not set them right.

To the testimonies of ancient authors to a fact, which the history of ancient navigation shows not to have been impossible, let us now add the opinion of modern writers ; some of whom have entertained the subject as one of general literature, while others have discussed it as one of theological importance.

“ Nullus tamen dubito, quin veteres aliquid crediderunt vel sciverunt, sed quasi per nebulam et caliginem, de America ; partim ex antiqua traditione, ab Ægyptiis et Carthageniensibus accepta, partim e raticionatione de forma et situ orbis terrarum, unde colligebant superesse in hoc orbe, etiam terras alias præter Asiam, Africam, et Europam. Disertissime Aristoteles de Mundo, Chap. 3tio.—*Terram habitatam pleraque Historia in insulas et continentes divisit, ignorans hanc esse unam Insulam Atlantico mari circumdatam. Probabile autem multas etiam alias huic obversas (αυτιπροσθυσας) procul sitas fuere, quasdam hac nostra majores quasdam minores ; nobis autem omnes præter hancce ignotas vel invisitatas.*”—Not. in Æliam var. Hist. a Perizonio. Lib. 2dus.—chap. 18.

“ Priscis quoque scriptoribus nostris, cogniti fuerunt ultra oceanum orbis alios ; de quibus Clemens Alexandrinus in Epistola quadam, teste Hieronymo, in cap. 2ndo. Epis. ad Ephesios. Nihil nunc de Atlantide Platonis dicam, res notior est quam ut referanda sit. Memorabile est quod Ælianus III. Histor. refert Silenum Midæ narasse : *Europam, Asiam, Lybiam, insulas Oceano circumfusas esse ; extra eas continentem quandam infinitæ magnitudinis quæ nutrit grandia animalia, et homines duplo majores et longæviores quam nostri sint.*” “ Adjecit : *hanc terram possidere grandem vim auri et argenti, ita ut inter illos populos minoris pretii sit quam*

apud nos ferrum. Hæ sunt magnæ illæ insulæ de quibus ex Aristotelis et Theophrasti mente Apulejus Libro de mundo. In Senecæ Sausoriis, avitus testatur communem opinionem jactari: *Fertiles in oceano jacere terras, ultraque eum rursus alia litora alium jacere orbem.* Quo Senecæ Tragædi predictiones in Medea pertinent.—Hornius de Orig. Americanorum, p. 57.

“Secundus adventus Phœnicum in Americam continetur illis priscorum scriptorum narrationibus, quibus navigantes in Atlantico mari novas detexisse terras, referunt. Quod Diodorus ventis et tempestatibus adscribit; cujus verba rem mirificè illustrent. Dicit enim: *Phœnices vetustissimis temporibus extra columnas Herculis navigantes ingentibus ventorum procellis ad longinquos oceani tractus fuisse abreptos, ac multis diebus vi tempestatis jactatos tandem ad ingentem insulam in oceano Atlantico, complurium dierum navigatione a Lybia in occasum remotam, venisse; cujus solum frugiferum amnes navigabiles fuerunt.* Quibus verbis nihil clarius esse potest. Nam et notam fuisse Priscis Americam, et Phœnices in eam navigasse ostendunt.”—Idem, p. 91.

Appended to Schmidt’s Edition of Pindar, 4to. 1516, is a dissertation on the question, “an America priscis hominibus fuerit cognita,”—which he determines in the affirmative. He supports his opinion by many passages from the ancient poets and historians, some of which I have already quoted, and others, together with his references to Holy Scripture, I have omitted; because I do not think they can fairly be applied to the subject before us. The testimonies he adduced were, in his view, sufficiently decisive to warrant the following conclusion.

“Ita ergo, non una sed pluribus, non obscuris sed evidentibus, non profanis tantum, sed et paucis testimoniis, probatum hactenus,

vobis fuisse confido, Americam illam nostram vetustissimis hominibus non incognitam fuisse.”

Beside the modern writers already quoted, who have treated the subject as one of general literature, there are others who have discussed it as a theological question; conceiving that our Lord's prediction, that the Gospel was to be published among all nations, (Matt. xxiv. 14.—Mark xiii. 10.) and St. Paul's declaration, that it was preached to every creature which is under heaven (Col. i. 23.) could not be true, unless it could be shewn, that the Gospel had been preached to the inhabitants of the American continent. Every rule, however, of legitimate interpretation would lead us to view these passages in a restricted sense, as we do the decrees of Nebuchadnezzar and Darius, which are addressed to every people, nation, and language, that dwelt in all the earth. (Dan. iii. 29.—vi. 25.) Though this interpretation is sufficiently obvious, it has not been satisfactory to the writers to whom I have alluded. I do not think it necessary to multiply quotations: those who wish for their names and the titles of their respective works, will find them in the authors referred to in the note.*

Before divines had introduced the particular question, “An Americanis Evangelium fuit publicatum,” the general one had been discussed with bitter animosity by those who envied the well merited honours of Columbus. Robertson, with his usual accuracy of research, has detailed to us the outline of the controversy; and, although the supporters of it failed convincing the world that other navigators had passed the Atlantic before Columbus, yet it throws some light upon our question, that America was known to the ancients.

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* Wolfius Curæ Philologicæ in Mark xvi. 15.—Noldius Concor. Particularium Heb. sub voc. ארץ. Not. 125.

There are two facts mentioned as proofs of an actual intercourse between Europe and America, centuries before the voyage of Columbus, which I cannot omit to mention. Basnage gives an account of a Jewish tomb, with a Hebrew inscription, having been discovered in one of the Azores by the Spaniards, when they first visited the island;* and the same writer relates a still more extraordinary circumstance.

“ On a trouvé, dans les mines, une Médaille d’Auguste, qui y avoit été peut être portée des ce tems-la ; et il y a une vallée qu’on appelle Impériale, *C. Autin.* parce qu’on voit dans la plupart des Maisons l’Aigle de l’Empire.”† We have this medal more particularly described in a subsequent work :—“ Sunt qui hanc continentem, (*Americam scilicet,*) a Platone sub nomine Atlantis descriptam, opinentur ; inquitque Marinæus, in Chronico suo Hispaniæ, hic nummum antiquum Augusti Cæsaris effigie insignitum in Aurofodinis inventum esse, missumque in rei veritatem summo Pontifici per Dom. Johanem Rufum, Archiepiscopum Consentinum.”‡ Other traces of European, or even of Jewish customs, observable in America, might be noticed ; but they do not properly belong to my subject.

In the controversy, which arose after the discovery of America, respecting the justness of Columbus’ claim to the honor of being the first modern navigator who had crossed the Atlantic, his enemies contended, that he had been indebted to the enterprise of others for his success ; and frequent appeals were made to old charts, in which the West India islands were marked. The truth is, that maps of this description do even now exist in the library of St. Mark at Venice ; and there is one in particular, made by Andrew Bianco, in the year 1436, wherein the situation of a large island

* Lib. vi.

† Idem.

‡ Abraham Ortelius Theatrum orbis.

in the Atlantic is delineated, and distinguished by the name of Antillia. A full account of this curious document, accompanied by a plate, is to be found in the Memoires of the French National Institute for the year 1806 ; and the writer considers it as furnishing satisfactory proof, that the Atlantic had been navigated before the successful voyage of Columbus.†

The inference which I draw from these multiplied testimonies is this : that the ancients had some knowledge of the existence of a transatlantic continent ; and that the passages I have adduced from their writings have been viewed in the same light by many modern authors, who have had recourse to them for different purposes. And let it be observed, that I do not contend for the existence of any thing more than *a traditional knowledge*, which was sufficient for the poet Seneca to have founded upon it the passage referred to. This gives a fair and decisive answer to the infidel challenge, which is as uncalled for as it is impious. The sentiments, put in the mouth of the Chorus, are those suited to the age of the author, not that of the heroes of the drama ; and it is universally admitted, that the conversion of tradition into prediction, or fable into fact, is among the most striking embellishments of dramatic or epic poetry. Thus we perceive, that an examination of the sources, whence Seneca derived his knowledge, evinces that his supposed prediction and its wonderful accomplishment do not weaken the argument in favour of the Christian religion, so justly drawn from the accomplishment of prophecy which it exhibits. Nay, we may add, that it is corroborated by exhibiting the weakness of the objection ; for we have shown, that this passage contains a prediction not founded on inspiration but on previous knowledge. Why do

† See also Letters from the North of Italy—Let. L.

not Infidels ground a similar objection upon the well known declaration of Copernicus, in answer to the objection that, if his system of astronomy were true, Venus would appear with phases similar to those exhibited by the moon—I doubt not, (said he,) but this will be one day found to be the case: a prediction verified by the discoveries of Gallileo? It is because they could not call that a prediction, which was evidently founded upon previous knowledge, that such a fact must be the case. The foundation of Seneca's knowledge was of a totally different nature from that of Copernicus; but it was nevertheless suited to his purpose; and the case which was adduced by Collins makes no more for the support of his argument, than the one he has overlooked.

A passage in Dante, which has been taken for a description of the southern constellation, called "the Cross," is supposed to resemble the passage under consideration—

I' mi volsi a man destra, e posi mente
 All' altro polo, e vidi quattro stelle
 Non viste mai, fuor ch' alla prima gente.

PURG. Lib. i. 22—24.

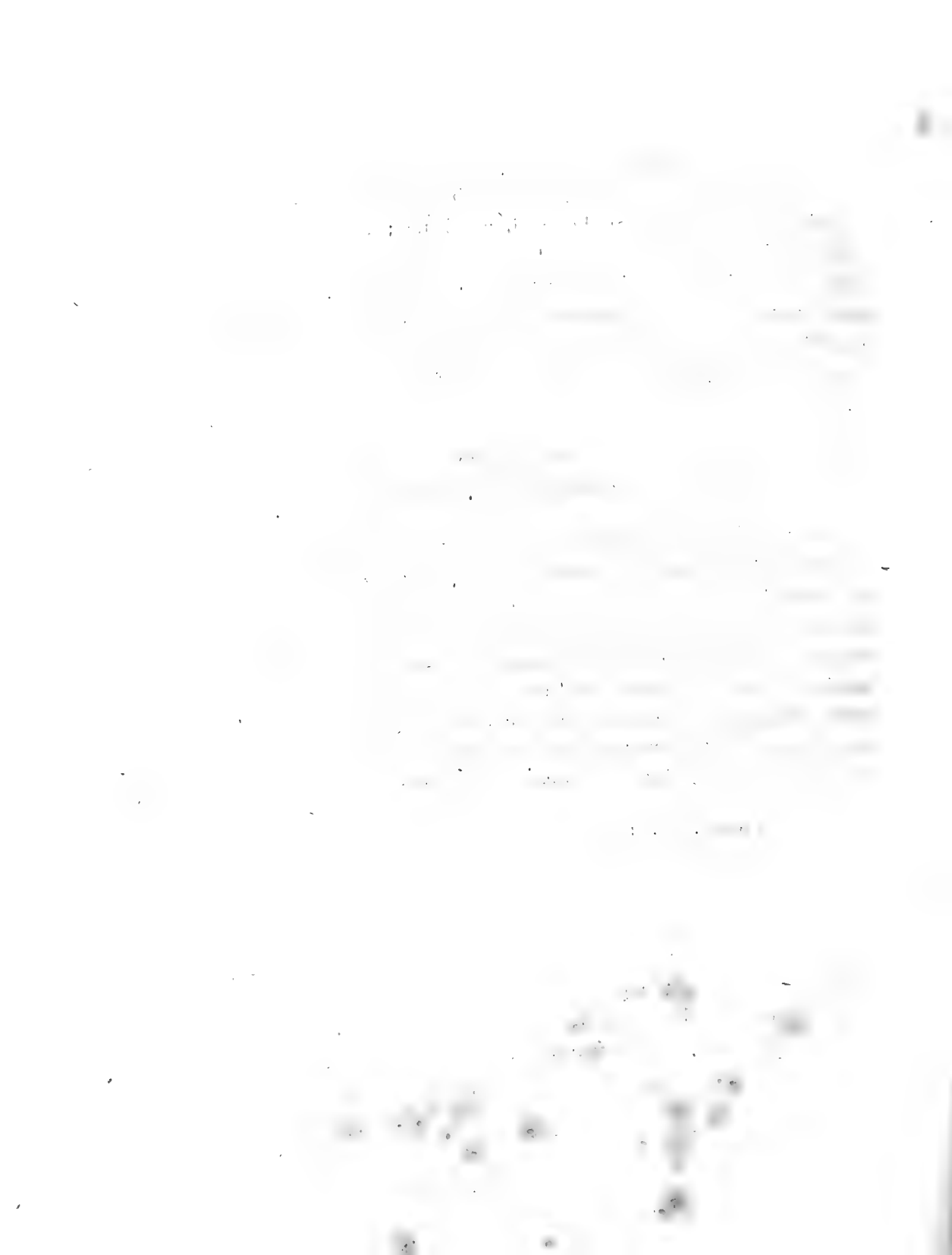
There is this remarkable difference: if Dante alluded to the Southern Cross, he must have had a supernatural knowledge of its existence; for it was beyond the reach of human knowledge, either direct or traditional. But there was nothing which rendered it impossible for Seneca to have known of the existence of a transatlantic continent, and I hope I have shown that he did know it, at least traditionally. Nor can we compare Dante with Copernicus, because the latter presumed on the existence of a fact, which every principle of science warranted him to believe; but the former had not the least ground for supposing that a constellation,

such as that to which he is thought to allude, did exist in the southern hemisphere. I imagine Dante intended these stars as allegorical representations of the cardinal virtues; and this opinion, which is that of several commentators, is rendered the more probable from his introducing elsewhere four such personages, who say they are *stars* in one place and *nymphs* in another.—See Cant. 31. 105. Besides, these four stars are made to shed their light upon the head of Cato, and to give a divine brilliancy to his countenance.

Li raggi delle quatro luci sante
Fregiavan si la sua faccia di lume.—*Id.* 37, 38.

I trust what I have adduced may furnish a conclusive answer to Collins, in the minds of those, who, like myself, have lamented the inefficiency of the arguments I have quoted in the commencement of this paper. The present times are distinguished by the revival of exploded objections against our most holy faith; and surely that is no unprofitable study, which leads us to confute them with arguments drawn from the stores of ancient literature; and proves, that, to whatever test we expose Divine Revelation, it will ever come forth as gold tried in the furnace.

Dublin, January 4th, 1821.



Description of a remarkable Building, on the north side of Kenmare river, commonly called Staigue Fort. By F. C. Bland, Esq. of Derriquin.

Read November 19, 1821.

THIS singular and interesting structure, which has latterly excited a great deal of curiosity amongst antiquaries, is situated nearly in the western extremity of the county of Kerry, in the barony of Dunkeron, and parish of Kilcrohane, upon the north side of the river Kenmare, in Lat. 51°. 46'. 0" N. and Long. 9°. 53'. 20" west of Greenwich. It is a circular building, raised with the stone of the surrounding country, (a silicious slate, not splitting into thin laminæ) bearing no marks whatsoever of a tool; and, though evidently constructed with a consummate degree of regularity and ingenuity, yet as obviously built before masonry had become a cultivated art. Its local situation is very imposing. It stands upon a hill comparatively low, between four and five hundred feet above the level of the sea, in a kind of basin or rather amphitheatre of lofty mountains; open to the sea on the south, with a gradual descent to it, and distant about a mile and a half from the coast. When the appearance of the country, which is barren and uninviting, is considered, it must create surprise, what could have been the inducement to erect *such a structure* in such a place; and, when the traveller, whose curiosity has supported him through a long journey, the latter part of which for ten or twelve miles has been through a

wild, uncultivated, though not an uninteresting country, first approaches it, he experiences a sensation of disappointment. For it stands a single object on a hill, and from its figure (being round) producing but little effect of light and shade; and, having no familiar object by which to measure its magnitude, and its importance being rather diminished by the extent and desolation of the surrounding scenery, he attaches a meaner opinion to it than it deserves. But when he enters it, he is struck with astonishment; and his imagination almost instantly transports him to distant ages lost in remote antiquity. He vainly endeavours to figure, in his "mind's eye," the beings who erected it, their manners, habits, and costume; until, "lost and bewildered in the fruitless search," his mind returns to sober investigation, again to lapse into conjecture. This effect is not lost by familiarity:—I have visited it a hundred times, and have always experienced the same sensation.

The plan, which I have annexed, and which has the advantage of accurate measurement, will, I hope, give some idea of the building. You enter by a door six feet high, by four feet six inches wide at top and five feet at the bottom, through a wall thirteen feet five inches thick, into an apparently circular area of eighty-eight feet one way by eighty-nine feet the other; but this difference of diameter is so small in proportion to its size, that it appears perfectly circular. The periphery is divided into ten compartments of steps or seats, ascending to the top of the surrounding wall in the shape of the letter X, through one of which you enter. The circumference is not accurately divided into these compartments; but the difference between them does not offend the eye at your first entrance, nor do you perceive it until you come to measure and examine the building in detail.

In one part, where the wall is perfect, it is surmounted by a pro-

jecting eave stone, which, when complete, must have added greatly to the effect of the whole. This is indeed the only attempt at ornament in the entire building.

In two of the compartments above mentioned, are two small doors: the one, two feet three inches wide by three feet one inch high; the other, two feet eight inches square. These open into two cells, in the interior of the wall, of different dimensions, both of them seven feet eight inches high: but one, seven feet ten inches long by five feet wide; the other, twelve feet long by four feet eight inches wide. These are constructed with flags, the one projecting over the other, until they come to the top, where a single flag finishes. Their figure is oval; and, though built, as before observed, without cement, they are water proof. This completes the description of the inside. On the outside, a moat or fosse, of twenty-six feet wide and six feet three inches deep, surrounds the whole building. This moat is sunk into the gravel, and the side nearest the building slopes up to the foundation about fourteen feet; which, being merely laid upon the surface of the ground, and not sunk, on account of the natural swell of the hill, elevates the building above the opposite side of the moat. The wall rises on the outside, upon an average, about eighteen feet. The inequality in its height is occasioned by the irregularities of the ground, upon the original surface of which it was built, it being, where perfect, level on the top. In that part, where I took my measurement, it is seventeen feet six inches high. It is remarkable that it does not rise perpendicularly; but batters two feet seven inches to the top: not in a straight direction, but with a curve, (expressed in the plan but difficult to be described,) which has a very striking effect. It also batters on the inside, about three feet ten inches, so that it reduces from thirteen feet at the bottom to seven feet at the top.

On the outside it is very smooth, and built with the greatest degree of accuracy and correctness, so that no deviation from the regularity of the curve appears in any part of it. The stones are small ; and the joints are all filled with splinters of stone, either hammered in so strongly, or pressed so closely by the weight of the superincumbent structure, that it is nearly imposible to pull one of them from its place. It is very extraordinary that the interior part of the wall seems to have been filled very carelessly, and little attention paid to laying the stones on the flat, so that one would be inclined to think, the weight of the internal material would, in time, have burst the sides out ; and yet in no place has it given in the smallest degree, though it must have been standing for ages. The only dilapidation is evidently by the hands of man ; for, until about thirty years back, when I first took it under my care, it was used as a pound. But still it is surprisingly perfect. In no place is the wall lower than ten feet ; and in one, it is perfect to the projecting eve stone, which originally finished it upon the top on the inside. It has no appearance of having ever had a battlement.

This is as accurate a description as I can give of this interesting structure. I have now to observe, that it is the only one of this peculiar construction remaining, in this country, in any state of preservation ; and I believe none have been discovered in any other part of the kingdom. There are indeed in its neighbourhood, each about three miles from it, in opposite directions, two stone forts in a state of barbarous dilapidation, which seem to have been built about the same time, and with nearly the same care ; but they do not shew the curve on the outside, nor do they appear to have had similar stairs or seats on the inside. One of them has the appearance of having originally had seats of different elevations all

round, in the nature of a regular amphitheatre ; but this, which as well as Staigue, is situated on my ground, is so dilapidated that the seats are scarcely to be traced ; and I should nearly doubt of their having existed at all, but for the testimony of a very old man who, some years back, assured me he remembered to see them much more perfect, and described them accurately. I am told by my friend Mr. Nimmo, that there is another stone fort, at Ballycarbery in Iverah, with seats round it, but I have not seen it.

The name of this building is Staigue or Staig, and the farm on which it stands is also called Staigue ; the etymology of which word I have not been able to discover satisfactorily. I understand Mr. Leslie Foster says it signifies steps or stairs, which, if an authentick meaning for the word, would be very satisfactory indeed ; but looks so like a “ palpable hit” that it ought to be supported by something more than assertion. In modern Irish it signifies a bleak, dreary, or desolate place ; but this meaning throws no light upon the subject ; and in this, and every thing else, we learn nothing concerning it from tradition.*

Staigue Fort, as it is called, has been a long time a lion in my family ; but the first public notice of it was taken by my late respected friend Mr. Pelham, a gentleman of considerable talent and curious research, who was engaged in writing a history of Kerry : but whose lamented death prevented his completing the work, and

* I have lately learned, that amongst the old people of the country, it is called *Staig a nair*, probably a corruption of *S'tig an air*, or the “windy house” ; literally, “it is the windy house” or habitation. This is more likely, from the circumstance of a gap in the mountain, just over it, being called *Barney Guhee*, or “the windy gap”.—Or it may be a corruption of *S'tig an air*, as being a shelter from storms, or of *S'tig an athair*, (pronounced without sounding the *th*) “the house of the father”, or “the father’s house” (a temple) : but the first seems to me most probable.

This mode of denominating places, from accidental circumstances in their situation, is very ancient. Thus Homer *ημεροσσων Ενισπην & Ιλιον ημεροσσων*—*Il.* L. 2. l. 606 & *L.* iii. l. 305.

whose papers have unfortunately been lost. He made an accurate ground plan and elevation of this building, which he sent to the late General Vallancey; who pronounced it to be a Phœnician Amphitheatre, and deemed it a strong support to his favorite theory respecting the colonisation of this kingdom. He never saw the building, and, if he had, might have changed his opinion.

About nine years back Mr. Leslie Foster visited this country, and passed Staigue by unnoticed; but, being prevailed upon by me, he was reluctantly induced to return and see it. He afterwards, as I am told, published, in some periodical work or newspaper, an account of it; in which, being ignorant, I suppose, of what I have stated respecting Mr. Pelham's correspondence with General Vallancey, he considered himself as the first discoverer of this ancient structure.

He presented the Dublin Society with a model of it in wood, in which the measurement, I presume, is correct, and which gives a good general idea of the building, but, being worked smooth, may lead the hasty observer into the error of believing it to be built with cut stone. Had it been executed on the spot, and carved after the original, something in the manner in which Dutch toys are finished, it would be a perfect representation.

So far from having any appearance of cut stone, it is obvious that no tool whatsoever was used in its construction, and every stone in it retains the figure it possessed when detached from the adjoining mountain. The most ignorant modern mason, laying the foundation of a circular building, would describe it by a line playing round a centre; but this, I believe, was laid out by the eye alone, and there is no accuracy of measurement in any part of the structure. Even the doors entering into similar apartments, are of different dimensions; and yet not so materially different as to suggest

their having been intended for different purposes. With all this, it forms a perfect whole ; and I have no hesitation in saying, that the best modern masons, with the same materials, unassisted by modern implements and contrivances, could not erect any thing like it. Yet it is evident, from the manner in which the interior part of the wall is laid, that, at the time of its erection, the art of masonry must, as already mentioned, have been in its infancy. There was a singular contrivance to facilitate the introduction of materials to the interior of the structure, during the time of its erection. A large space was left open on one side, which was evidently filled up after the rest of the building was completed. This would have been very effectual for the introduction of wheel carriages, as it is on that side from which they could best approach it : but, as I cannot think such implements were in use at the time it was built, it impresses me with the conviction, that there must have been a great number of hands employed in the work ; for a smaller number could, without inconvenience, have supplied materials through the door way, which was fully large enough for the purpose, and equally accessible.

Various conjectures have been made by curious visitors, as to the original purpose for which this extraordinary edifice was erected ; whether it was intended for a place of defence, of public exhibition, or of religious worship. The first idea that would strike every body is, that it was intended as a place of defence and security, and this conjecture is mainly supported by the moat, with which it is surrounded ; and I should think it can hardly be doubted, that it must have been a place of great strength, at a remote period, when modern instruments of destruction were unknown. A vicinity to water must have been indispensable to a place of defence ; and in that respect the situation of this building is peculiarly judicious,

for two mountain streams nearly surround it, at a distance of not two hundred yards, and form a junction farther down in front of the door. I do not think it would be possible to turn these streams from their course. A military gentleman observed, that it would be assailable by slings, or perhaps by arrows from the adjoining mountain. This may be the case, and slings and arrows are the earliest weapons of war, but it is very difficult to fix upon a situation totally unassailable.

As a place of public exhibition, or as general Vallancey stiles it, an amphitheatre, we are greatly puzzled to conceive how such a structure could have been erected for such a purpose in such a place; and the cells are too small to admit any beasts but wolves or wild boars. However it is observable, that the stones used in the outside of the wall are not in general so large as those on the inside, and the projecting eve on the inside was obviously intended for ornament, as for defence it would have been placed on the outside, and have been constructed with long and weighty stones. It is also to be observed, that no contrivance for fastening the door of entrance appears ever to have been used; at least there are no holes for transverse bars, or any other contrivance now remaining.

The last conjecture is equally difficult to support. We know of no antient place of worship like it; and it has no appearance of a Druidical remain. I must not here omit the suggestion of my learned and ingenious friend Mr. Nimmo—It struck him, that it may have been intended for an observatory. How it could have been applied to this purpose, I shall leave to himself to explain; but I believe the idea occurred to him from a supposition, that the door would be found exactly to face the meridian sun. In this conjecture he is supported by fact. I have lately ascertained the bearing of the door to be south twenty-nine degrees west by the compass,

which, assuming the variation to be something more than two points and a half, makes the door face south. Mariners allow the variation on this coast to be two and a half points, as sufficiently exact for the purposes of navigation: but I have, by a mean of three observations, found it to be within a few seconds of twenty-nine degrees; and the difference of a few seconds is, in this case, of little consequence. For the jambs of the door being built of rough undressed stones, it is impossible so correctly to hit the centre on both sides as to ascertain its bearing with mathematical certainty: but I have no hesitation in asserting, that it was originally built with the intention of facing the meridian. This circumstance is most extraordinary, and well worthy of consideration. It could never have been the result of mere chance. Whether it makes most for Mr. Nimmo's conjecture, or goes to show, that the people who erected the building were fire-worshippers, I shall not take upon me to determine. It certainly affords a strong presumption, that they were not entirely ignorant of Astronomy. For the satisfaction of those, who may be inclined to doubt the fact, I have, in the subjoined note, detailed the method by which I have obtained the bearing of the door way.*

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* Having suspended a plummet from the centre of the door on the outside, I suspended another from the centre on the inside, with a distance of about ten feet between them. I then placed my instrument (an excellent circumferenter with sights, and having a very steady needle,) near the wall on the opposite side; and, having levelled it, cut the two lines suspended from the door way. I then measured my line from the door to the opposite wall; and, fixing a pole in the centre, I found it to be an exact line by my instrument, with the two plummets. I then proved my line by measuring a diameter at right angles to the spot where my pole stood; and found it to be exactly in the centre of the building. I then took the bearing of the door by my instrument, which I had never stirred; and found it to be south twenty-nine degrees west.

REMARK BY MR. NIMMO.

The observation of my ingenious friend, Mr. Bland, shows I was not wrong in my conjecture

I do not pretend to be an antiquarian; and it is with great diffidence, and no small degree of apprehension, that I venture a conjecture upon the subject: but, having given so complete a description of this building, and furnished ground for the learned to turn up, I think I may be pardoned for my temerity in hazarding an opinion. Conjectures are allowable, where as yet nothing has appeared but conjecture. I suppose, at some very distant period, a colony (Phœnicians if you please, possibly about the time they first visited Spain, or previously to it) to have crossed the Atlantic, from the pillars of Hercules, in quest of a settlement, or in pursuit of a country productive of ore; and, having made the western extremity of Ireland, found the river Kenmare open to receive them. Sailing up this river, they would naturally be inclined to land at the first place that appeared convenient for that purpose. The small bay, at the foot of Staigue, affords the first convenient situation. The shore on either side of the river, until you reach that spot, is absolutely intangible. There, a small opening presents a flat and inviting shore, where they might have landed; and, finding the country tolerably fertile, and bearing the appearance of containing ore, they might have settled, and built this fort, as a depôt and place of security. I have been led into this conjecture from the

of the position of the gate. I have no observation of the variation of the compass, at present by me, nearer to Staigue Fort than that on Admiral Knight's chart of Cork harbour, where it is marked $28^{\circ} 10'$. In Kenmare River I know it is somewhat more westerly. It appeared to me, that the structure exhibited a sort of rude graduation of the horizon: first into two hands of five fingers each, each finger into quarters; and these again into gradi or steps. The cells might be places of shelter for two observers: one to observe the rising sun, and the other his meridian shadow. But I leave this conjecture to be pursued by more able antiquarians.

The exterior mould of the wall has evidently been formed by staking down one end of a cord in the centre of the area, and bringing the other to the exterior face of the wall. This gives both the circular plan, and the particular curve of the profile, until near the top; where it has been brought nearer the vertical.

circumstance of there being two excavations made into the solid rock, obviously attempts in quest of ore, in the neighbourhood of this fort; both of them executed before the art of mining was understood. One of these, Crohane's cave, (so called by the common people for the country, from their believing it to have been the residence of that saint, from whom the parish takes its name,) is sunk about eight feet into a rock of quartz, decidedly in search of ore, and is situated within a mile of this building. The other is within four hundred yards of it, and is an indentation made into a hard silicious rock. This seems to have been deserted in consequence of the indication of ore having diminished to a mere thread, not six inches long. These attempts seem to have been made in the first and rudest period of the art of mining; and most likely by the occupiers of this fort. These adventurers, disappointed in the great object of their pursuit, and finding nothing else in the country to induce them to remain, might consequently have deserted their settlement; and might have left this structure, and the others of nearly a similar construction, to puzzle antiquarians. The round buildings commonly called Danish forts, though by some denied to be Danish, are to be found every where in this country; and there is one of them within half a mile of Staigue. These may have been built in imitation of the first fort, by the wild natives of the country; and are vastly inferior to them in execution. I am of opinion, that the first inhabitants of this country were Troglodytes, living under ground in caves; an incredible number of which still remain, and very many of which I have myself explored. They are of the rudest structure, though I have seen them with apartments one within the other; and long narrow passages between them, like a rabbit-burrow. I recollect one of them, which consisted of four apartments of an oval shape; each about eight feet long, as well as

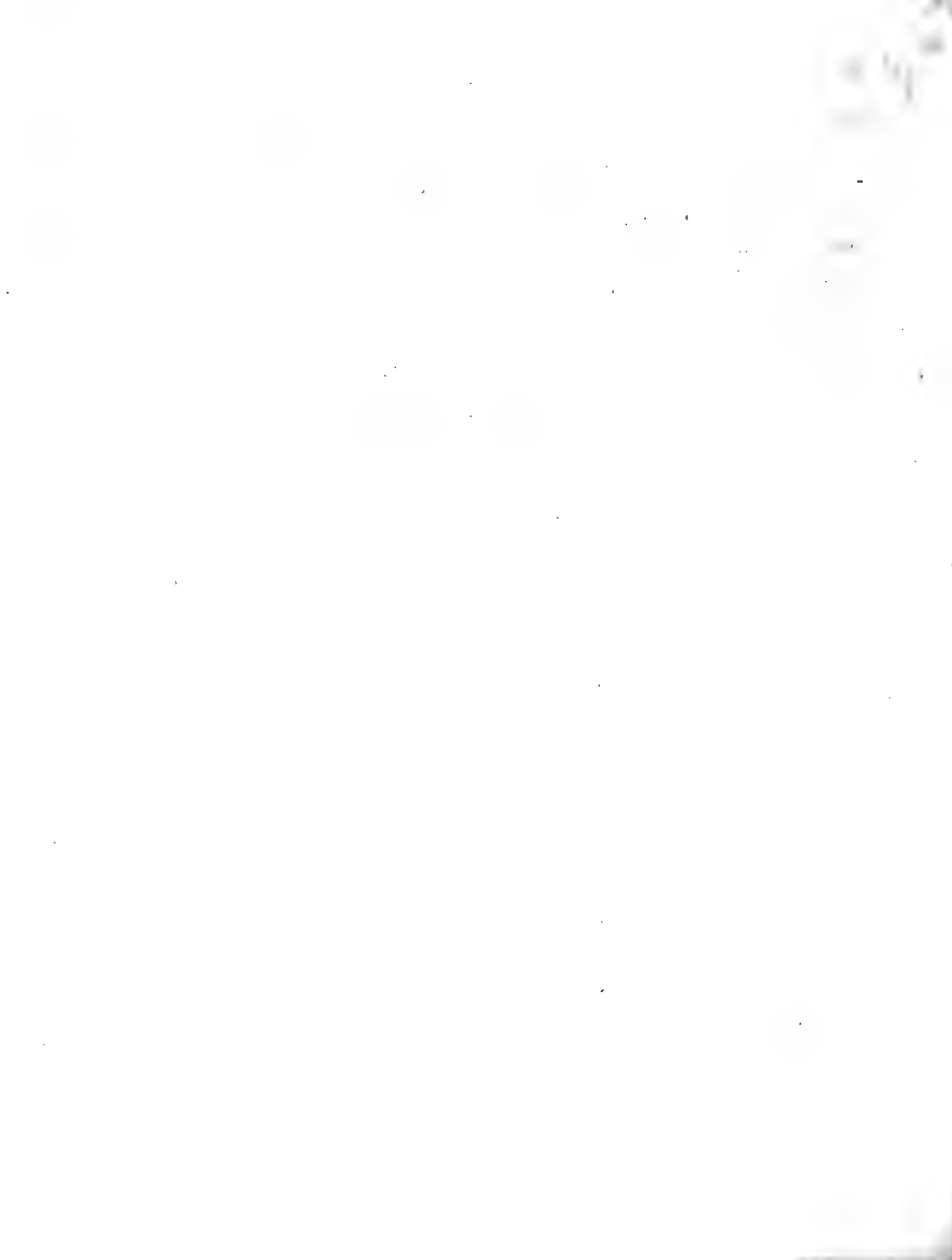
I now can recollect, and about six feet wide. There seems to have been some attempt at elegance in the construction of this one. The centre apartment had three more branching from it, at right angles, which, with the passage forming the entrance, gave it the shape of a cross. This was evidently a subterraneous house. Some of these caves have sustaining walls of dry stone works, to confine the sides, and support the flags which form the ceiling. Some of them are excavated into the hard gravel, with the flags resting on no other support; and so low, that you can only *sit* erect in them. That is, from three to four feet from the floor to the ceiling. I have not seen any higher than four feet. If my conjecture be true, they seem to have continued the use of caves, even after they had adopted round forts; for in many of these forts are found similar caves. In one which I opened on my own demesne, I found two, exactly like those I had explored, where no fort at all stood. So similar were they to each other in construction, that no doubt remains upon my mind, that they were executed by the same people, and for the same purpose. I believe them to have been used as dormitories, and depôts for their most valuable effects; as places of shelter from wild beasts; and as permanent residences, particularly for their women and children. The tradition of the country makes them granaries; but for granaries they could never have been intended, as it would have been very difficult to convey grain into them, through long and narrow passages, not more than two feet square; and, for granaries, where was the necessity of separate apartments inside of each other? It is also scarcely credible that corn, at so early a period, could have been at all in use; and still more incredible, that this country could have produced it.

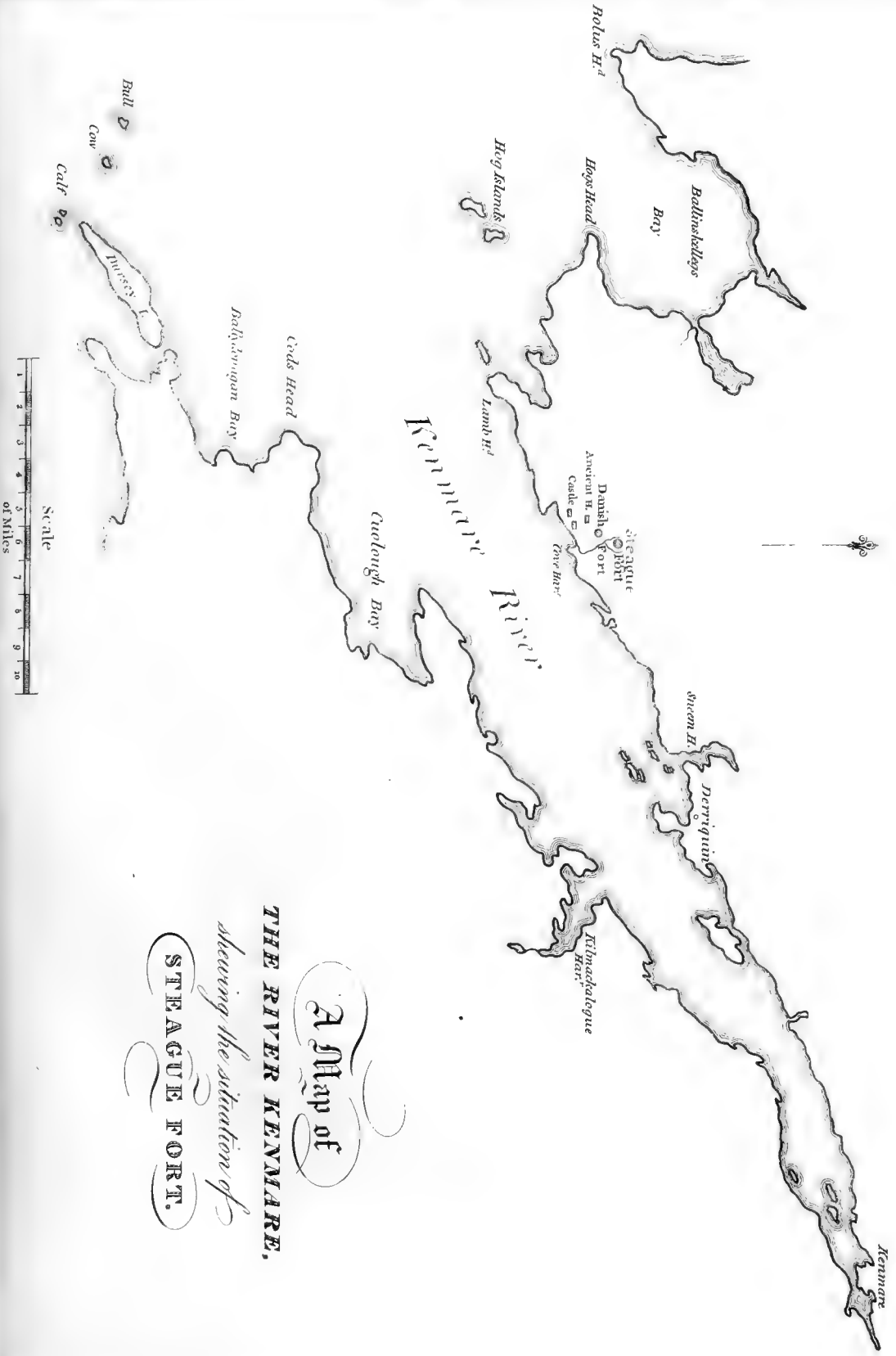
It may not be uninteresting, and not entirely foreign to my subject to mention, that on the adjoining farm to Staigue, within less than

a mile of it, are the remains of an ancient house, of a very uncommon description. It consists of one apartment, of considerable size, with two doors opposite each other, like our modern cabins; and two small windows. It has no fire-place or chimney, and is built without gables. The roof stood on large beams, placed perpendicularly in the wall, the spaces which they occupied still remaining. It is built with lime made from calcined oyster shells. I once thought, that this house was copied from the old church of Code, situated about a mile from it; but, when I consider that it has no gables; and that, in taking the church for a model, they probably would have adopted a framed roof, in preference to the other clumsy contrivance, I am inclined to think it of an older date. The church, besides, is built with stone lime, which gives it a more recent date. This house I preserve with great care; but there is one more in this country, which will soon share the fate of all mundane structures.

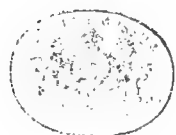
The whole family, cows, pigs, dogs, and horses, we are told, lived promiscuously within the walls of this ample mansion, a custom still remaining amongst the lower orders. A little distance from this house stands an unfinished castle, which tradition tells us (I do not vouch for the fact) was intended, at a more recent period, for the residence of the family which occupied this house; but which, being built through the vanity and ambition of the lady of the soil in the absence of her lord, was by him discontinued at his return home, and never completed. There is also a good modern house on this farm; so that all the changes, from the most rude state of society (if it deserves that name) to its present happy state of improvement, may here be traced.

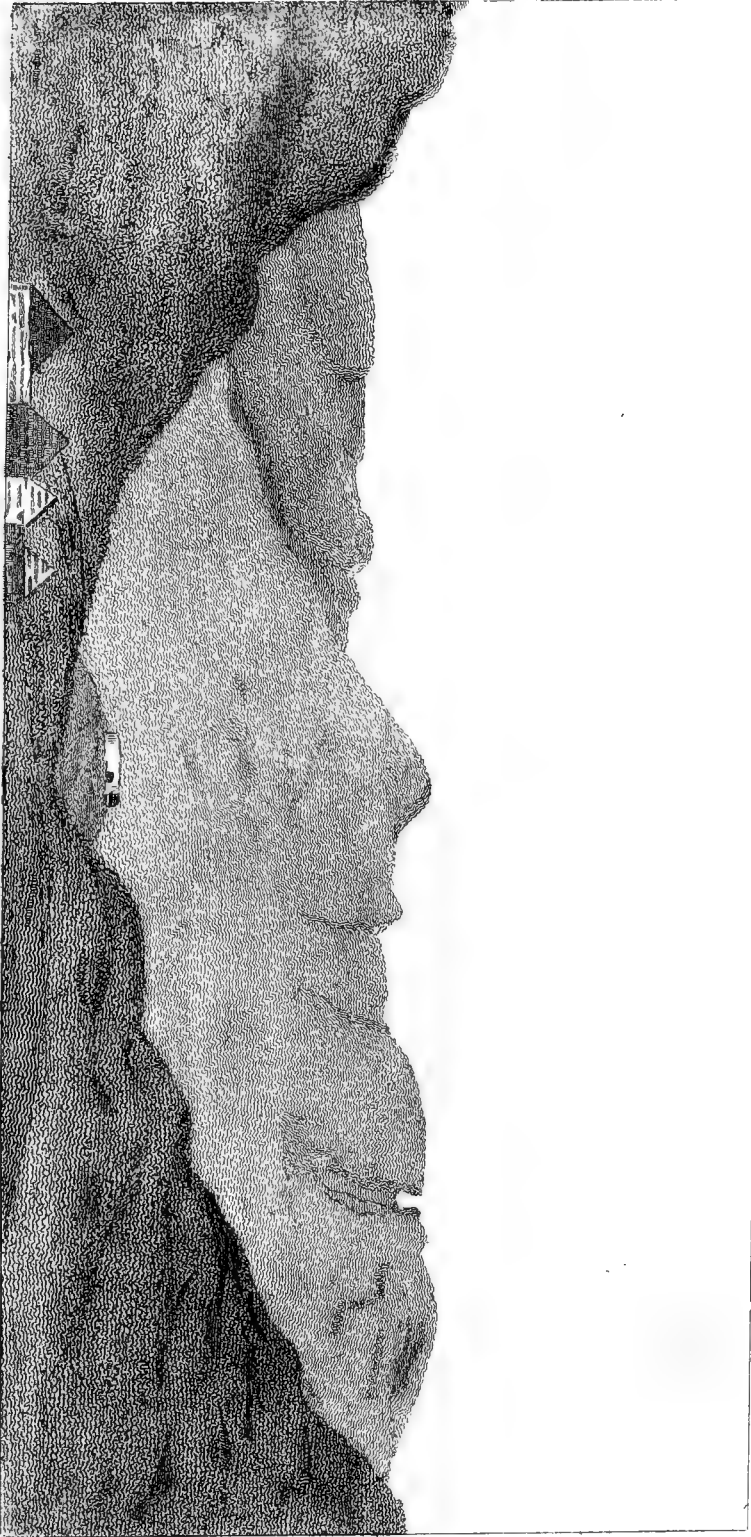
I have only to add, that from the appearance of the land here, it seems to have been formerly more thickly inhabited than at present; and certainly more so than the surrounding country.





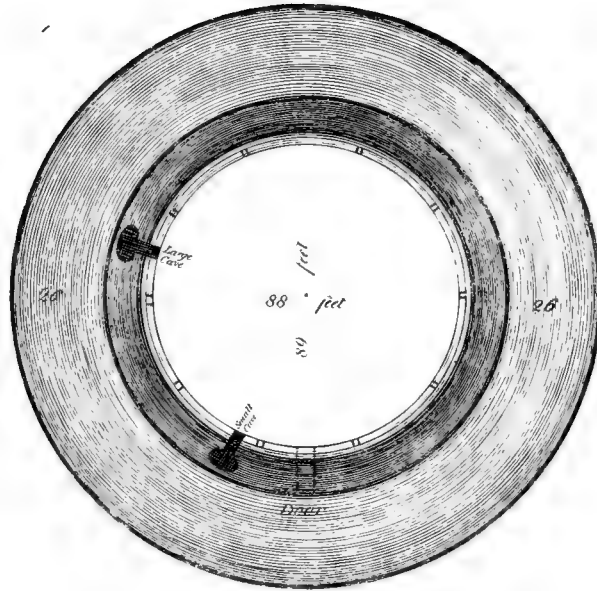
A Map of
THE RIVER KENMARE,
showing the situation of
STEEPLE FORT.



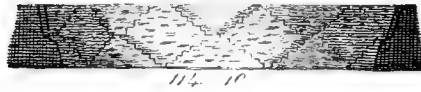


Steagoe Fort from the South.



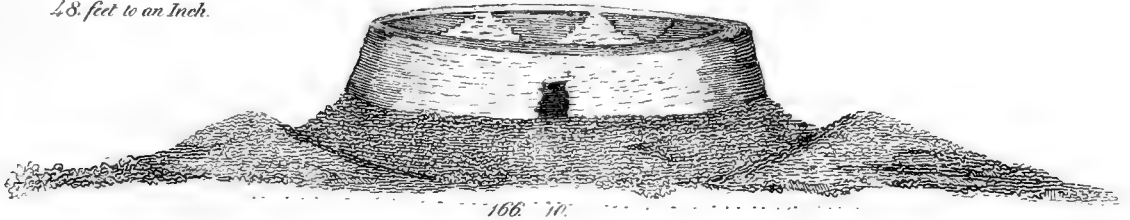


Ground Plan.



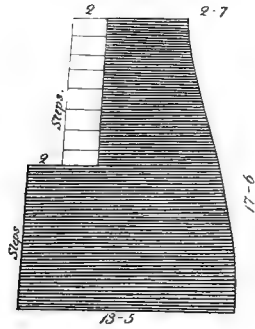
Section 1.

Scale
 48 feet to an Inch.

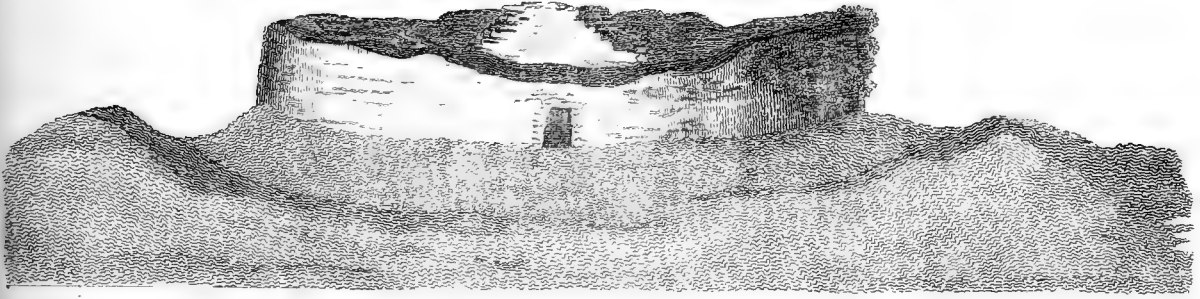


Elevation D
Shewing the Inside.





Section of the Wall
upon a larger Scale
10 feet to an Inch.



Steaque Forte in its present State
from recollection. Scale 32 feet to an Inch.



Description of the Barnaan Cuilawn, and some conjectures upon the original use thereof; together with an account of the superstitious purposes to which it was latterly applied. Also a description of the remains of an ancient Mill, which were recently discovered near the ruins of Glankeen Church, in the county of Tipperary. By Thomas Lalor Cooke, Esq.

Read January 7, 1822.

THE curiosity commonly called the "Barnaan Cuilawn", which is now in the possession of Mr. Cooke of Parsonstown, in the King's county, was found, some centuries since, in a hollow tree, at a place named Killcuilawn, situate in the mountains, and distant about two miles from the village of Burrissileigh, in the parish of Glankeen, and county of Tipperary. This Antique is likewise called, in the Irish Language, "Obair na Snaom", that is, the Saint's "Work."

The Barnaan Cuilawn in shape resembles a mitre, and is made internally of wrought iron; which internal part, although now nearly eaten away by rust, appears to have been originally about three tenths of an inch thick, having in its summit two round holes of about three tenths of an inch in diameter, which do not seem to have been ever intended for receiving any kind of screws or rivets. It is about eleven inches and an half high, and the bottom (in shape a parallelogram) is about eight inches long and four inches broad; whence its length and breadth gradually di-

minish, it being at the top only six inches and one half long, and about two inches broad. Around the bottom is a kind of brass frame, or base, of about one eighth of an inch thick and two inches in height, having at each corner a round brass pedestal, about three inches high and half an inch thick. These pillars extend about three eighths of an inch lower than the brass frame, so as to form a kind of feet. In this brass frame, or base, on the front side of the Barnaan Cuilawn, is a small semicircular opening, about an inch in diameter, and somewhat resembling the aperture of a bee-hive, through which its inmates pass in and out.

The iron, or internal part of the Barnaan Cuilawn, appears to have been originally all covered with brass* and highly ornamented. The top, which is the most curious part now extant, is of cast metal, like brass, of a whitish yellow colour, and exquisite workmanship. It has several apertures, and is beautifully inlaid in Runic knots with gold, silver, copper, and some dark-bluish granulated metal which I at first took to resemble Cobalt, having on each of its sides four representations of an eye, and on the ends two bald antique heads, (much like those of stone, which are frequently to be met with in the walls of ancient monasteries in Ireland,) and two other representations of eyes. In the top are inlaid three pieces of yellow stone, or composition, intersected by other narrow red stones, both in appearance like Jasper. It is however right to remark that those parts of the inlaying, which appeared to me to be Cobalt, are not in reality of that metal; for Cobalt is said not to have been discovered until about the year 1733, although the beautiful colour in some ancient stained windows and

* There is brass still adhering to parts of the iron, and which has the appearance of having been united to it by the effect of fire.

oriental porcelain would seem to argue, that this metal was longer known.* I have consulted W. Higgins, Esq. Professor of Chemistry to the Dublin Society, and he says, that this bluish metal is not Cobalt, although he could not then take upon himself to say what it really was.

The back and one of the sides of the Barnaan Cuilawn are still covered with thin brass plates, on the former of which is visible an engraving of a cross.† Several credible and respectable inhabitants of the parish in which it was found affirm, that, within the last forty years, there was a cross upon the front side of the Barnaan Cuilawn, enriched with various coloured precious stones; but, although much pains have been taken to procure this cross, rewards and enquiries have proved alike ineffectual. The cross just spoken of has been lost in the following manner. After the death of the Rev. Mr. M'Enairy, Roman Catholic Vicar of the Parish of Glan-keen, the Barnaan Cuilawn fell into the hands of his successor, the Rev. Michael Bohun, a man of great learning, but who had not much taste for the antiquities of the country. Upon Mr. Bohun's having been newly come to the parish, the Barnaan Cuilawn was, in the hurry of removing, unfortunately thrown, along with some articles of furniture, into an open stable; and, while it remained there, some person, induced by a wish of possessing part of so re-

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* The late General Vallancey, in the *Collectanea de Rebus Hibernicis*, Numb. 13. vol. 4, treating of the Liath Meisicith of the ancient Irish Druids, says "it is well known that Cobalt, ground up with oil, will lie an hour or more in that unctuous state, and then burst into an amazing blaze;" and considers it as "probable, that the Druids, who were skilful chymists, (for their days) could not be ignorant of so simple an experiment."

† This Cross, (a drawing of which is annexed, fig. 5.) it is very remarkable corresponds in shape and the number of lines of which it is formed with that given in Ledwich's *Antiquities*, plate 18. as engraved on the tomb of O'Toole, who is said to have been interred in Glendaloch in the year 1010.

vered a relic, or more probably by a spirit of avarice, took away the cross before mentioned.

Many fabulous and superstitious stories, relating to this piece of antiquity, have been handed down by tradition, and are still implicitly believed by the illiterate of the neighbourhood in which it was found. As these tales may happen to prove serviceable to the antiquary, or entertaining to the less scientific, I shall here recount a few of them. Thus it is said, that any person, who was fortunate enough to gain possession of the Barnaan Cuilawn, was always attended by good luck superior to that of any of his neighbours; and that one Burke, who inhabited the Castle of Burrissileigh about the commencement of the seventeenth century, having by some misfortune lost the Barnaan Cuilawn, in a few nights after an invisible hand brought it back while he was sleeping, and placed it upon a table near his bed side.*

It is likewise a story among the people, that a noted hurler, named Fitzpatrick, wanting a hurl on the eve of some great match, went to the tree in which "the Saint's work" was found, in order to lop off a branch; but, when in the act of cutting it, happening to look towards his house, which stood at a little distance, he imagined he saw it in flames. Affrighted, he leaped from the tree, and ran to save his burning house. On his approach, however, to his astonishment, the house was in safety, and no appearance whatever

* The following inscription, still legible on a stone, which is in one of the walls adjoining this Castle, and is supposed to have been formerly placed over the principal entrance, gives one a strange idea of the hospitality and ferocity of that age in which it was written:

" Richard Burk—Alicc Hurly—
 " Marmoreum cur surgat opus
 " Facit hospes et hostis: hospes in
 " Amplexus, sed procul hostis eat.
 " 1643."

of fire. He then returned to the tree ; and, again imagining that he saw the house enveloped in flames, ran to save it, but still it was unhurt. A third time he went to the tree, enraged, determined at any risque to cut the hurl, and a third time the house appeared on fire. However, he persisted in cutting, and, on returning home, found his habitation in ashes !

Another story, which is likewise told, although superstitiously accounted for, is certainly fact. It is this. There was, at the foot of the tree just spoken of, one of those holy wells common in Ireland, which actually removed to an opposite hill. The reason assigned by the peasantry for this removal is, that some giddy female had washed clothes in it ; and the water, indignant at the profanation, changed its course to another direction. The truth seems to be, that the water found some more ready canal, by which to discharge itself, in one of those accidental fissures often found in hills like those which encompass that sequestered spot. But to pass by these fables, it is certain that this relic was, and is to this day, held in high veneration amongst the uneducated in the vicinity of the Parish of Glankeen, as having something sacred and supernatural about it. For a long time past, (perhaps some centuries) it has been used in that parish somewhat in the same way as the Anglo-Saxons formerly used the corsned bread, or morsel of execration, which was supposed to cause convulsions when taken by any person asserting a falsehood.*

We are told that the ancient Irish, about the beginning of the Christian æra, made use, in their judicial proceedings, of a kind

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* A remarkable instance of the effect of the latter we have recorded in the person of Godwin, Earl of Kent, who, it is said, abjured the murder of the king's brother by this way of trial ; and, as a judgment for his solemn perjury, the bread stuck in his throat and choked him.

of collar, called *Jadh Morain*. By this miraculous collar, says the historian, they tried the integrity of the witnesses who were to give evidence; for, if it were tied about the neck of a person designing to give false testimony, it would shrink close and extort the truth, or continue contracting itself until it had suffocated him.*

In like manner it was supposed of the Barnaan Cuilawn, that, if any swore falsely by it, his face would change to his back, and the order of nature be distorted. There was living, until within the last three or four years, a man, who was reputed to have fallen a victim to the dreaded supernatural influence of this piece of antiquity. This person, afterwards nicknamed *bujlín*, that is "Loaf," having been accused of stealing some bread, protested upon the Barnaan Cuilawn that he was not guilty; and, immediately, by a contraction of the muscles, his mouth was drawn close to his left ear! Without entering into any enquiry as to the *real*† cause of this poor creature's misfortune, it may gratify curiosity to mention, that, in point of fact, the distortion of his features occurred at an advanced period of life, and continued until his death.

A Mrs. Dunn, to whom the Barnaan Cuilawn descended *as an heirloom* from her ancestors, named Spellane, used until recently to earn a livelihood by hiring it out for people to swear upon. The form observed was this: When any thing was stolen, the Barnaan Cuilawn was sent for to Mrs. Dunn, and on the messenger's paying one shilling,‡ and swearing by itself that he would safely return it, he was permitted to bear it away in a strong leathern case (purposely prepared for it) to those who sent him. On the arrival of the Barnaan

* Keatinge.

† Probably some paralytick affection.

‡ In Mr. Dutton's Statistical Survey of the county Clare, page 352, is an account of a similar superstitious form of oath. There, in giving a description of an image of Saint Monalagh.

Cuilawn, the persons suspected were obliged to purge themselves of the accusation by swearing upon it; while, with all the solemnity of a religious rite, they at the same time touched it with a hazel wand or rod. He who refused to do this was stigmatized as a convicted plunderer. Women would never touch it; and, so great awe was this ordeal held in, that many, who would perjure themselves if the gospels had been presented to them, when sworn upon the Barnaan Cuilawn, almost invariably told the truth, even though it were the acknowledgment of their own guilt. The only instance mentioned to the contrary, is the solitary case already alluded to. In order to check the progress of superstition, it was taken in one of these swearing excursions, about the year 1797, by the before mentioned Roman Catholic Vicar of the parish of Glankeen; from whose successor (who is now dead many years) its present possessor obtained it.

As tradition is equally silent with regard to the original use of the Barnaan Cuilawn and the meaning of its appellation, I take leave (though not without much diffidence) to offer the following, as my own ideas respecting its use and name. Its original use at

near the church of Dysert O'Dea, he says, "The Crozier of this Saint is still preserved with great care. It is called the Boughal (stick), and is of curious workmanship. It is held in such veneration, that oaths are taken on it with great solemnity, and a shilling paid for the use of it to a poor woman, who gives it out to any person who applies for it, and it travels safely cabin to cabin."

In all probability this is the Crozier, which is at present preserved in the museum of Doctor Tuke in Stephen's Green, Dublin.

Mr. Rawson, in his Survey of the county Kildare, speaking of St. Evin, who filled the Abbey of Monasterevin with monks, says, "The consecrated bell which belonged to this Saint, called *Bernan Empin*, was on solemn trials sworn on, and was committed to the care of the M'Egans, hereditary Chief Justices of Munster."

It is worthy of observation, that *Bernan* is a name given also to the bell of Saint Evin, and, Mr. Rawson has spelled it correctly, it may come from the Anglo-saxon *bernan*, to burn.

one time seemed to me to have been as one of those Ciboria, which the primitive Christians were in the habit of making in imitation of the Jewish tabernacle. However, upon more mature consideration, I relinquish that opinion for one that appears to be better founded, and now look upon it to have been a dome or cover of a Thurible. The kind of censer used amongst the Jews, we are informed, was a sort of chaffing-dish,* covered with a canopy, the use of which might have been borrowed from them by the early Christians. By supposing cavities to have been made in this chaffing-dish for admitting the pillars or feet of the Barnaan Cuilawn, so as to keep it firm, the remainder would completely bear out this conjecture. Thus the semicircular aperture at the base would admit air to support combustion; the strong iron lining was calculated to withstand the effects of internal fire; and the holes in the top, to suffer the rarified air and smoke to escape. This conjecture as to the original use of the Barnaan Cuilawn, is rendered still more probable from the accommodating spirit of the early Missioners in Ireland, who, in order to scandalize their new converts as little as possible, turned things connected with the pagan worship to answer the purposes of their own religion. Thus, previous to the erection of churches, the Christian clergy used to assemble with their congregations at the druidical upright stones, and in the druidical temples. In like manner the nuns at Kildare kept up the holy fire, which had been kindled there by Druidesses several ages before. The learned author of the Antiquities of Ireland, speaking of these ancient druidical fires, says, that they were kept from scattering by iron curbs,† for which he gives the following authority, viz. “*Ferro superne investitæ, &c. Woun. Barthol. 273*”. It

* Encyclopædia Britannica.

† Ledwich's Antiq. 76, 7.

is very likely, that the use of this *iron covering* for sacred fires might have been borrowed from the Druids, as well as the use of their temples, &c. and this is rendered the more probable from the circumstance of the druidical fire itself having been afterwards continued by the Christians, at least at Kildare.

The word Barnaan, as it is here applied, appears to be derived from the Irish *βαη*, a top, or head of a thing; and *αν*, fire,* that is *βαη-ηα-αν*, the head or cover of the fire. This derivation seems to me to add considerable support to the foregoing conjecture respecting the original use of the Barnaan Cuilawn; and would, if there existed any tradition of a holy fire having been kept up in that parish, like that of Saint Bridget at Kildare, be conclusive upon the subject.

With regard to the remaining part of its appellation, viz. Cuilawn, (*as it pronounced*,) that I at first took to be a corruption of the Irish word *Cuile-αν*, (a holly) which epithet I then supposed might have been bestowed upon the Barnaan in after times, from the circumstance of its having been found in a tree. The inhabitants of the parish of Glankeen, however, attributed the additional epithet, Cuilawn, to a Saint of that name, who they suppose made it with his own hands.† From him also, they say, (and probably correctly) that Kill-Cuilawn, and the well which formerly sprung there, took an appellation. After much search made for any Irish Saint of that or a similar name, I have succeeded in discovering, that Culanus (in Irish called *Cuilen* or *Cualen*)‡ is the name of the Saint who built the church in the parish of Glankeen, where this curiosity was found. This proves how correct the com-

* αν, fire,—O'Reilly's Dic.

† The other name by which it is known, i. e. *Οβαηη ηα ζ-ηαομ̃*, favours this opinion.

‡ Colgan. Act. SS. Hiber. 369.

mon tradition in this instance is ; and shews, as I conceive, that the word Cuilawn arises from the name of a Saint, as that tradition would have it. In Colgan's *Acta Sanctorum Hiberniæ* fo. 751. in the life of Cormach, King and Archbishop of Cashel, taken from the old M. S. book of Lecan, I find the following account of that Archbishop. Cormach lived in Munster, and was descended in the manner therein mentioned from Oilum Olum.* It then states that he had five brothers by the same father, viz. Becanus, *Culanus*, Eminus, who was also called Euius, Diermitius and Boedanus or Baitanus. Of these the three latter emigrated into the provinces of Connaught, Leinster and Ulster, and the two former remained in their native province, Munster, and of them the book gives the following account :—“ Sanctus manuque Becanus remaneus in Mumoniâ Monasterium de *Killbecani*, alias *Cluinaud* “ *Mobhecoc* erexit et sanctissime et rerit : Sanctus vero *Culanus* in “ valle quâdam regionis de *Hi Luigdheach*, *Glean-chaoín* nuncupata, Ecclesiam extruens, inter suos cognatos et notos remansit ; quos “ beneficiis et piâ devotione erga se propense affectos, divite almæ “ suæ benedictionis tandem locupletavit hæreditate.” Thus we have *Culianus*, or as he was called in Irish, *Cuilen*, clearly ascertained to have been the founder of the parish church of *Glankeen* or *Glean-chaoín*, in the county *Hi Luigdheach*† in Munster, which

* S. Cormacus, filius Eugenii, f. Marchaldii, f. Muredacii, f. Diermitii, f. Eugenii, f. Aildi Flanbeg, f. Fianchi Muillethain, f. Eugenii magni, f. Aildi Olum.—Colgan.

† All the country from *Sliabh Eachtighe* to *Limerick*, belonged originally to the province of *Conach*; till *Luighuidh Mean*, who descended from *Conac Cas*, made a conquest of it by the sword, and added it to the province of *Munster*. This tract was called *Grabh Fhearon Luigheadh*, that is, the lands of *Luigheadh*. Keating's *Tr. Harris' Ed. of Ware's Bishops*, fo. 36. n.—says, that *Hy* signifies the lands possessed by families, so that *Hi Luigdheach* means *Luigheadh's* country also. I do not know whether the tract of land described by Keating be that known at present by the name of *Sleigh*, as I believe *Sleib Eachtighe* to be on the confines

appears to me to be the precise parish in which the Barnaan Cuilawn was found; for this parish was part of the ancient territory of *Sliegh*, as that territory, which is now united with Kilnamana and Kilnalougurty, under the common appellation of the barony of Kilnamana, comprehended the entire parish of Glankeen and of Bamacurra, being part of the adjoining parish of Ballycahill.* As it appears by the cross which still remains in-

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of the counties of Galway and Clare. Whether these tracts of country be the same or not, it is evident that the place mentioned in Colgan is the parish in which the Barnaan Cuilawn was found. Archd. Monas. Hiber. p. 46, which mentions Gleanchoain amongst the Abbies of the county Clare, says, "This valley is in Hi Luigdheach in Munster, at the bounds of the See of Killaloe.—Saint Patrick built an Abbey here." It then adds "This place is now unknown." In the first part of this statement the Monas. Hiber. quotes Acta SS. 207; but, although I have searched there, I have not found any thing to warrant it. As Archdall, placing Gleanchoain in the county Clare, admits that it is unknown, or, in other words, that such a place cannot be found there, it is reasonable to conclude that there is no such place as Gleanchoain in that county, and that it is to Gleanchoain in *Sliegh* in the county Tipperary Archdall alludes. This latter place corresponds with that mentioned in the Monas. Hiber. in every particular except the county. Thus that book describes Gleanchoain as situate *at the bounds of the See of Killaloe* and Glankeen, where the Barnaan Cuilawn was found, is in point of fact one of those parishes in the Archbishoprick of Cashel, which are *next adjoining to the Diocess of Killaloe*. The Monas. Hiber. says, that Saint Patrick built *an Abbey* at Gleanchoain, and Colgan (ubi supra) *giving the same topographical description of the place*, writes that Culanus or Cuilen erected a *church* there. In reality, the remains of two buildings raised in different periods still present themselves in the ruins of Gleanchoain or Glankeen church. Besides, both Colgan and the Monas. Hiber. agree in describing the place as a valley, and Glankeen church lies in a glen near the foot of Knockanura mountain. Add to this the coincidence of the name of Saint Cuilen with that of the place near Glankeen church called Killcuilawn, and also with the Barnaan Cuilawn, which has certainly been for many centuries in that parish. I think I have heard, that there was an old building formerly at Killcuilawn, the stones of which were carried away about 30 or 40 years since by the Rev. Thomas Ryan, who was then R. C. Vicar of the parish. He made use of them, as well as I remember, in building a house. Perhaps, as Killcuilawn is not above a quarter of a mile from Glankeen church, this was the building of which Colgan speaks.

* Beaufort's Map of Ireland. See also an ancient Geography of Ireland, which says *Sliegh*

scribed upon the **Barnaan Cuilawn**, as well as by the set one which was lost, that it was used in the service of the Church since the introduction of Christianity, the conclusion is not far fetched to say, that the words, **Barnaan Cuilawn**, (although now but little understood) originally meant "the cover of Cuilen's fire."

The popular tradition of the country having been proved, as I consider it, to be correct with regard to the name of Saint Cuilen, may perhaps be allowed to have some weight in ascertaining the age of the curiosity under discussion. That tradition (which is further supported by the appellation *Обаянъ наъ-наоѳн*) says, as I have already mentioned, that the **Barnaan Cuilawn** was made by Saint Cuilen's own hands, and, if that be supposed to be true, fixes the time when this relic was formed to the beginning of, or perhaps a little anterior to, the tenth century. I have not met with any account of the time when Saint Cuilen died; but, as he was the brother and contemporary of Cormack, King and Archbishop of Cashel, who was killed in the year 908, we may fairly suppose that he died about the same period. A corroborating proof of the **Barnaan Cuilawn's** antiquity presents itself in the antiquated heads raised upon its sides, and the like of which I am informed are to be found only in buildings prior to the twelfth century. The Runic knots and gyrations, into which the inlaying on it is for the most part convolved, also demonstrate, that it was fabricated about the 9th century; and it is remarkable, that ruins are also to be found in stone on Cormack's chapel on the rock of Cashel, the erection of which building is attributed to Saint Cuilen's brother. A further evidence of the **Barnaan Cuilawn's** having been made about the period already mentioned arises from the comparison of the cross

was a barony in the county Tipperary; also a map of Sleigh in the Record Tower, Dublin Castle, which was copied by General Valancey from the original in Paris, which bears date in 1657.

still remaining engraved upon it with that upon the tomb of O'Toole, who was buried in Glendaloch in the year 1010, an engraving of which is given in Ledwich's Antiq. plate, 18. Both crosses are composed of a similar number of straight and curve lines similarly placed. Additional testimony of its antiquity is borne by the chevron-like inlaying of silver in the bluish metal before described. If the Barnaan Cuilawn be considered as ancient as the year 900, it affords a good specimen of the perfection to which they brought the works in metal in those days, and bears much in favour of the then civilized state of Ireland.

The Barnaan Cuilawn was in all likelihood hidden during some of the troubles, with which Ireland has been continually convulsed; and, the person, who concealed it, having probably soon after met an untimely fate, it remained unseen, until, after some generations, the hand of time, having rotted away the tree in which it lay concealed, exposed to view this relic of antiquity.

Having thus given the best account of the Barnaan Cuilawn, that my slender information enables me to offer, I shall now proceed with a description of the remains of an ancient Mill, which was lately dug up in the same parish, within about 150 or 200 yards of the ruins of Glankeen church.

As a peasant, of the name of Kelly, was digging some time in the month of February 1821, for the purpose of levelling an angle of his garden, situate within a short distance of the ruins of the church so often before mentioned, he discovered, adjoining a little stream, the remains of an ancient mill, buried in clay, a small way under the surface of the ground. He also discovered there several planks of oak from eight to ten feet in length and of considerable thickness, most of them being fitted with tenents and mortices apparently for the frame-work of the mill.

There was no iron met with by him, except a little pick, or hatchet, (now in my possession) about seven or eight inches in length, the edges of which are not very hard. A drawing of it is annexed, fig. 1.

The only piece of wheelwork discovered is the remains of a spir-nut, or more properly of a trundle-head, which is a good deal mutilated. It appears to have been composed of staves rather than of spokes or rungs, and these staves have been carved out of a solid block of oak, as represented in fig. 2. This figure represents the trundle and lower part of its spindle, B, which is also of oak, carved out of the same block with staves, and appears to have been burnt at the extremity in order, as I suppose, to render it hard. The upper and remaining part of the spindle seems to have been inserted into the square hole, A, which is morticed into the upper part of the trundle-head.

The only mill-stone found is that represented in fig. 3, having a conical and plane side, the latter of which is very rude and uneven. This stone must have been used as the under or bed stone, the conical side of which was the working one, as it still has visible upon it the circular marks of the friction occasioned by the running stone, besides that the flat surface is too uneven to have been ever used in that way. In this stone the perpendicular height of the cone is about six inches, although the stone itself is not more than two feet and eight inches, in diameter. As it has no furrows, this fall of six inches to a base of sixteen was very necessary to discharge the corn when ground. The upper or running stone must of course have been concave, to match the shape of the one already described.

Fig. 4. represents what I take to have been the cistern or trough for discharging the water upon the waterwheel. It was carved out

of a solid block of oak, and two holes, *f, f*, in one of its ends, through which the water escaped.

There is not any person at present living who remembers to have heard of this mill. A respectable farmer of the name of Dwyre, aged about 65 years, and who now holds that farm (as he did since his father's death) never knew of such an edifice having been there. He distinctly remembers his father and grandfather, both of whom held this farm, yet he never heard them speak of any mill having been there. Its antiquity may also be well deduced from the fact of the spindle having been made of wood, as well as from the shape of the stone. Doctor Ledwich* says that the mills, mentioned in Cambrensis to have been in Ireland in his time, seem to have been water-mills, erected by the monks, and to which the vicinity resorted. Long before the time of Saint Cuilen, who, according to Colgan, built Glankeen church, there was an Abbey founded here, as appears by the *Monasticum Hibernicum*,† so early as the time of Saint Patrick. It is not improbable but that the one just described might have been used by the clergy belonging to the adjacent church of Glankeen for the purpose of grinding their corn.

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* Antiq. p. 375.

† Fo. 46.

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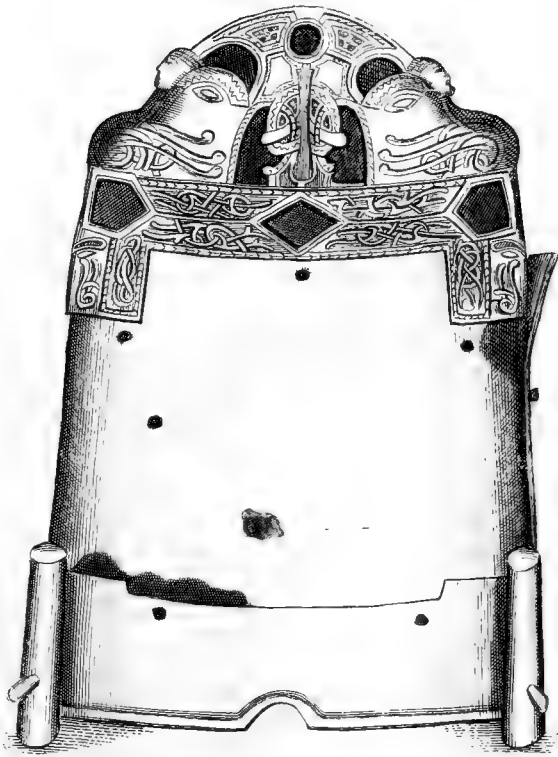
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*Front of the "Barnaan
"Cuilawn."*



Fig. 1.

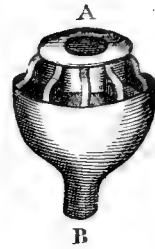


Fig. 2.

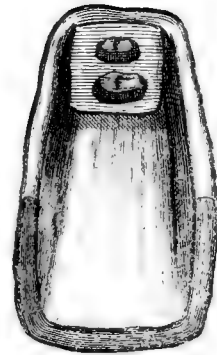


Fig. 4

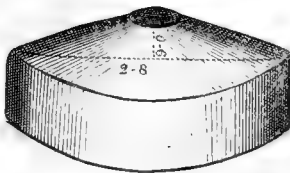


Fig. 3.

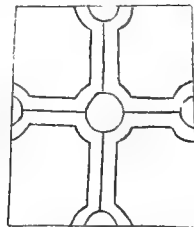


Fig. 5.



*On the Norwegian Settlements on the Eastern Coast of Greenland,
or Osterbygd, and their Situation. By Sir Charles Lewis
Giësecke.*

Read January 26, 1824.

ALTHOUGH the North of our globe is certainly not a region likely to be chosen voluntarily and without compulsion for a habitation, yet history informs us, that these countries were inhabited even at an early period. It might, however, happen, that want of subsistence, dissensions with countrymen, or a spirit of chivalry and piracy, would compel families and whole tribes to leave their native country and to remove farther to the north. This was particularly the case with some northern nations, formerly comprised under the name of Normans, who harassed all countries by their depredations. In this way, in the year 982, on occasion of the banishment of an offender, a new country was discovered. Thorwaldsen, a Norwegian Jarl or Earl, was obliged to fly on account of a murder he had committed, and accordingly went to Iceland, where he settled a considerable part of the Island with a new colony. His son, Eric Raude, or Eric the Red having been persecuted by Egolf Taur on account of murder, his revengeful spirit at last prompted him to kill Egolf likewise. This and other misdemeanors he had been guilty of compelled him to quit Iceland. He knew that a man of the name of Gunbiörn had discovered the rocky islands, called by him Gunbiorn's Skjar, on the western side of Iceland; but likewise still more to the westward a country of

great extent. Being condemned to banishment for three years he determined upon making a voyage of discovery to this country. Soon after he had set sail he saw the point of land called Heriolfssnes; and, after sailing a little more to the south-west, he entered a large inlet, which he called Eric's Fiord, or Eric's Sound, and passed the winter on a pleasant island in the vicinity of it, to which he gave the name of Eric's Ey. In the following year he examined part of the continent of this vast country; and, in the third year, he returned to Iceland, where, with a view that a considerable number of people might be induced to follow him to the new discovered country, which he called Greenland, he made an exaggerated description of its fertility. Accordingly there set out for this place twenty five vessels, with people and cattle for breeding, of which vessels fourteen only arrived safe. These first colonists were soon followed by more, as well from Norway as Iceland; and, in the space of a few years, their number increased so much, that they formed themselves in two bygds, or settlements, on part of the eastern and of the western coast, called Osterbygd and Westerbygd: they increased so much, that they were divided into parishes, and subjected to a bishop. Some of the Danish Chronicles are rather too prolix in their enumeration of parishes, churches, monasteries and villages, particularly as villages are not common either in Iceland or in the western parts of Norway.

This account of the first settlements on the coast of Greenland rests on the authority of Snore Sturleson, a celebrated Icelandic judge and historiographer, who wrote his account in the year 1215. Other Danish chronicles place the discovery and population of Greenland in the year 800.

The Christian religion, which was first embraced by Eric the Red and his son Leif, made extraordinary progress, and was dif-

fused in the course of a century all over the settlements. There were on the eastern coast alone twelve parishes and two monasteries. Arngrim Jonas gives an account of seventeen bishops down to the year 1412. A short time previous to this period, the Esquimaux (Greenlanders) began to shew themselves on the west coast of Greenland. It is very difficult to say with certainty from what country they came. I am quite convinced that they came from the west coast of Davis's Strait, around Baffin's Bay, as the people in Terra Labrador are of the same nation: a nation, which is undoubtedly very extensive, which inhabits Nootka Sound, William's Sound, and probably emigrated from these distant residences by land, over the Copper-mine-river, and the lakes down to Hudson's Bay. Every one who reads Cook's and Clarke's account of these people with attention will be surprised by the resemblance of these two distant families, as to their language and manner of living.

The time of the extirpation of the Icelanders on the coast of Greenland is very uncertain, and there are very different opinions on this subject. I shall quote them briefly, and then submit my own opinion.

Some attribute it to warlike attacks or battles between the Esquimaux and Norwegians. I think it is quite ridiculous and absurd to suppose, that these timid, feeble, wretched creatures, who could not arrive in masses on the spot, who neither use nor know instruments of war, should attack and defeat a robust, valiant, brave set of men known through ages as heroes.

Another opinion is, that the European settlers were exterminated by a kind of plague called the black death, which made dreadful devastations in the north of Europe in the year 1350. But, at that time, all intercourse had already ceased between the settlements and

their mother country. How came the black death to Greenland? And would not the Greenlanders have been more exposed to such a disease on account of their uncleanness? Another opinion is, that they perished of famine by the sudden setting in of the polar ice, which covers the sea from time to time, and which cut off their connection with their native country. Is it forgotten, that the settlers subsisted from their cattle, and from their inland salmon fisheries?

I may now be permitted to deliver my own opinion in a few words. All the houses of the Norwegians were built differently, and on different places from those of the Esquimaux. The Norwegians lived in Fiords, and mostly at their ends; they looked for grass, fresh water, and shelter for their cattle, and for salmon-fishery: the Esquimaux live from the spoils of the sea, and place their houses as near to the rocky shores as possible.

All the ruins of Norwegian houses, and there were more than fifty which I examined, were surrounded by immense masses of rocks, probably precipitated from the summits of the adjacent mountains, and heaped together in the most fantastic groups, the places of fracture being sometimes so fresh, that the points from which they are broken are distinctly observable. Places of desolation of this kind are frequently met with in the mountains, connected with the sea by waterfalls, which are precipitated, with tremendous noise and destructive velocity headlong from the rocks, covered with glaciers. I have no doubt but that such a revolution, caused by bursting glaciers and following inundations, has effected this dreadful chaos; and that perhaps the Norwegian settlers perished, and were buried with their cattle in the ruins. All that I found near the ruins of their churches were scattered fragments of bells. It is singular enough that I could not find any trace of Runic stones, which must have existed in the vicinity of their churches and monas-

teries. The individuals, who escaped this destruction, have mixed with the natives. I could easily recognize and distinguish the European (Caucasian) countenances from the Mongolic, although there have elapsed more than three centuries since their extermination. This difference of countenance is not visible amongst the natives on the western coast, except in those parts of the Danish settlements where Europeans intermarry, or where the natives come in connexion with European vessels for the purpose of trade or whale fishery. It appears further, from different Scandinavian or Icelandic words adopted in the language of the Greenlanders, words used in domestic life, that there existed a friendly intercourse between both nations. Such are Gwanneck, (*Angelica Archangelica*,) the Gwanne of the Icelanders and Norwegians, a favourite vegetable, eaten raw and boiled by both nations. Such is Nisa and Nisarnak, two species of dolphins, called Nisen by the Scandinavians. Such is Kona, Wife, Kona of the Norwegians, and different other words. But the most striking appeared to me to be the words Tornak and Tornarsuk. Thornak or Torngak signifies in their language soul, and spirit, or demon; and Thornarsuk or Torngarsuk, a being similar to a spirit. A spirit-like being, called by the Greenlanders Thornarsuk, is the only supreme being acknowledged by them, without being worshipped. Now it is evident to me, that the word Thornarsuk is to be derived from Thor, the god of Thunder of the northern nations, to which they have added their suffix ak and aruk. They attribute to this being the same propensities attributed to it by the old Scandinavians, namely, to excite thunder, to effect other phenomena in nature, and to reside in cliffs of rocks. I conclude from this, that the Greenlanders were in intimate connection with the old Icelanders, that they adopted some of their religious principles, prior to the introduction of Christianity; and

that the rest of the Icelanders, which escaped the extermination of their countrymen, united themselves with the Greenlanders.

It remains now to point out the situation and the extent of the settlements which existed on the eastern coast, on the authority and nomenclature of the Icelandic historian, Ivar Bardsen, compared with the names given by the Esquimaux. From this it will appear, that the old settlements by no means extended to so high a degree of latitude, as it is generally believed. The difference in some names used by Ivar Bardsen and Biorn Johnsen arises probably from the different periods in which they lived, and from the change of the places of settlements.

According to oral communications, received by such of the natives as live in 65 or 66 degrees of latitude, the soil is so barren and dry, that, a few spots excepted, it does not afford so much straw as they want to put in their boots. This is also confirmed by Captain Scoresby in his Journal, vide p. 177.

The following are the names of the old Norwegian settlements compared with the Greenlandic places on the eastern and southern coasts, where ruins of Icelandic buildings and cultivation of the soil are still to be found.—*See the Map.*

BIORN JOHNSEN'S AND
IVAR BARDSEK'S
NORWEGIAN NAMES.

1. Ollum-lengri.
2. Bergefiord.
3. Skagafiord, Heriolffiord.

NAMES USED BY THE
GREENLANDERS.

- No settlement.
Puisortok.
Kangerluksoeitsiak, ruins on
its northern side.

NORWEGIAN NAMES.

4. Heriøls-næs.
5. Hvarf.
6. Spalsund.
7. Drangei.
8. Haf hvarf.
9. Hellisey.
10. Helliseyarfiordr.
11. Ketilsfiord.
12. Aros-Kirke.
13. Peters-viig Church, (Kirke.)
14. Watns-dal.
15. St. Olufs Kloster, (Augustine order.)
16. Rafns-fiord, with Vogekirke, (of the order of St. Benedict.)
17. Einarsfiord.
18. Hofgards-kirke.
19. Stor Fiskesoe.
20. Thorvalds-viig.
21. Klineng.
22. Graaevig.
23. Dom-kirken i Botnen.
24. Reens-ey.

GREENLANDIC NAMES.

- Southern side of Kangerdluksoefriak with ruins.
- Cape Diskord and Alluk.
- Ikareseksoak, sound between Statenhuk Islands, and the Continent of Greenland 60°.
- Statenhuk's Island.
- Kangek-kyadlek.
- Omenak.
- Tunnua, Sound near Omenak.
- Illua.
- In the firth Illua.
- Ruins in Kaksitsiak.
- In the firth Tessermiut.
- On the Northern side of the firth Tessermiut.
- Narksamiut.
- Tessermiut.
- In the firth Tessermiut.
- Tessersoak, near Koorsoak.
- Tessiursarsuk, four miles to the south-west from Nougarsuk.
- Nougarsuk.
- Akpaitevik.
- Tessermint-Kingoa.
- Nenortelik.

NORWEGIAN NAMES.	GREENLANDIC NAMES.
25. Lang-ey.	Sermesok, or Cape Farewell.
26. Kam-stade Fiord.	Kunnermint, to the south of Ounartok.
27. Hvals-eyar-fiord.	Ounartok.
28. Thiodhildar-stadar.	Narksarsoak.
29. Erics-ey.	Tuktuktuarsuk.
30. Erics fiord.	Agluitsok.
31. Dyrnees Kirkesogn.	Kangerdluluk.
32. Mid-fiord	Kallumiut.
33. Buurfield.	Akulliaraseksoak.
34. Brattahlid.	Sioralik.
35. Fossasund.	Ikarsarsuk.
36. Yttreviig.	Sergvartursok.
37. Lambeyar.	Omenartout, Ikermiut, Omenarsuk, and other islands.
38. Lambeyar-sund.	Karsok.
39. Breede-fiord.	Igalikko.
40. Leidar-kirke.	Itiblik, in Igalikko.
41. Mioefiord.	Kakortok.
42. Eyrar-fiord.	Kangerdluarsuk.
43. Borgar-fiord.	Turnuliarbik.
44. Lodmundar-fiord.	Kingoa ; in Tunnuliarbik.
45. Gardanes.	Valley in Kindgoa.
46. Isafiord.	Sermelik.

Where the Osterbygd terminates.

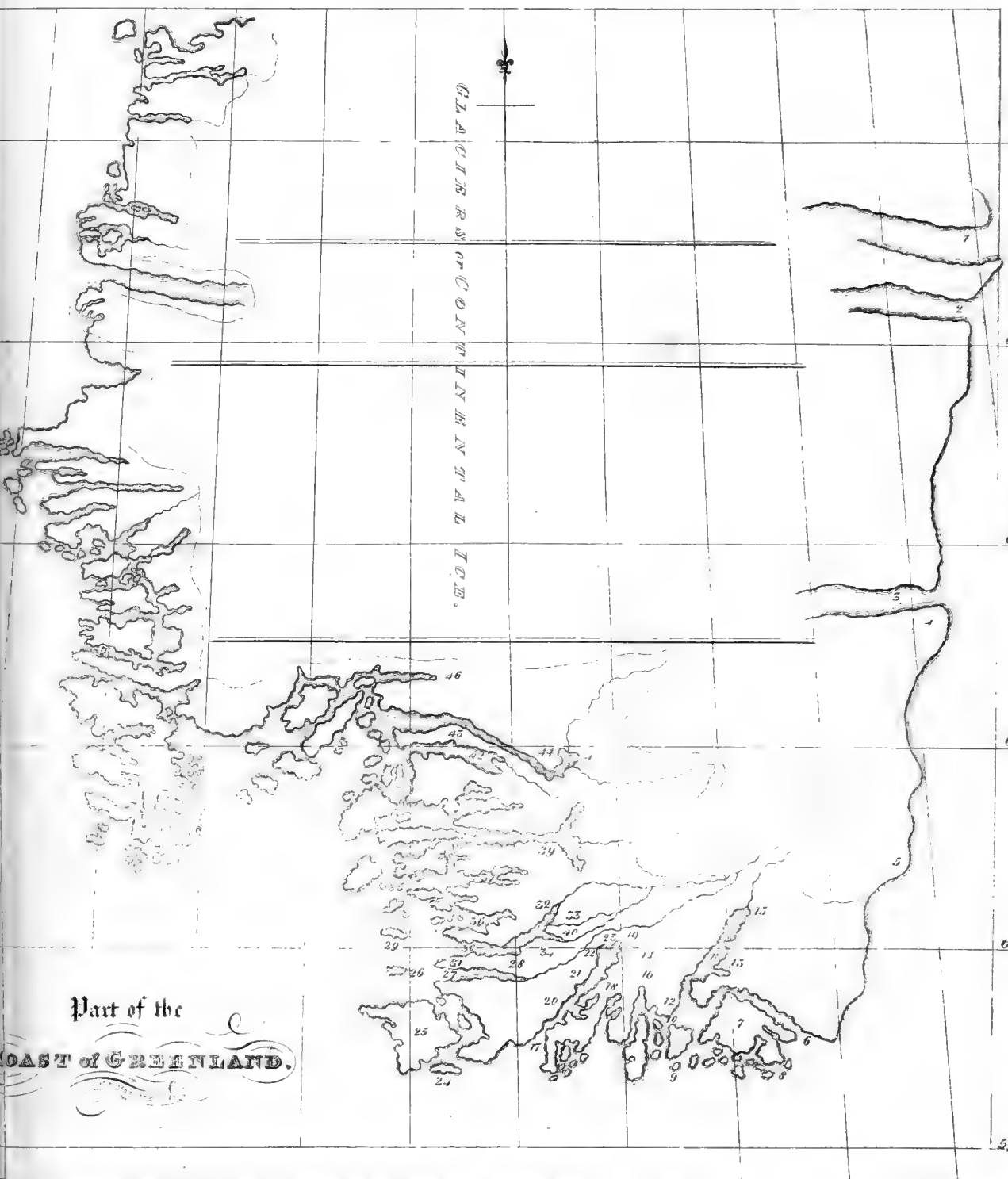
The Firths Tessermiut and Tunnugliarbik appear to have been better inhabited than any of the others, on account of the fertility

of their soil, and the abundance of fish: the ruins of their houses bear testimony to the wealth and comfort of their former inhabitants, in comparison with the remains of other buildings in other Firths. You will find here a very luxuriant vegetation, with several plants foreign to this part of the arctic regions, and probably imported and cultivated by the former settlers; for instance, the *Sorbus Aucuparia*, different species of the *Potentilla*, of *Carex*, the *Pinguicula Vulgaris*, &c. all plants which only are found in the neighbourhood of former Norwegian settlements. *Pinguicula* is used in different parts of the north of Europe, particularly in Norway, Iceland, and Lapland, to prevent the curdling of milk. Both Firths abound in shrubs, particularly in species of *Salix*, *Betula*, and *Juniperus*. Most of the fragments of bells were found in the neighbourhood of the churches of these two Firths; and the ruins of the buildings brave the destroying power of time and climate.

I have followed in this essay such authorities only as appeared to me authentic, supported by my own experience with respect to the undoubted Icelandic ruins, which I found on the coast, and which differ widely from the remnants of old Greenlandic houses, as to their form, structure, and durability. There is no want of historical accounts written by Icelandic and Danish authors, with respect to the old settlements; but these accounts are so contradictory, that it is quite impossible to reconcile them. Thormodus Torfæus, late historiographer to the King of Denmark, published in his *Greenlandia Antiqua* (Havniæ, 1706, 8vo.) four different maps, or *Delineationes Gronlandiæ*, which differ from each other as materially as if maps of different countries. The earliest, of 1570, is of Sigurdus Stephanius; the second, of 1606, is from Gudbrandus Torlacius, an Icelandic bishop; the third is from another Iclander, Jonas Gudmundus; the fourth, of 1668, from Theodorus Torlacius. To these,

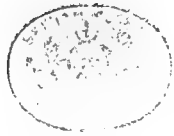
the author (Thormodus Torfæus) adds his own ; but he confesses fairly, that he does not think it to be a correct or a satisfactory one. Be this as it may, his work is the best critical historical account that ever was published on East Greenland. The uncertainty and darkness, in which the earlier history of Greenland is enveloped, may be accounted for, from the circumstance that nobody was formerly allowed to sail thither without a pass, under forfeiture of his life. The eagerness of sailing to Greenland was occasioned by a report, that there was a great abundance of gold and silver, and many precious stones, and that in former ages some ships brought great treasures from thence ; but the loss of many vessels, which sailed thither under the orders and at the cost of Queen Margaret of Denmark, discouraged her from venturing other attempts ; and the queen, being afterwards engaged in a war with Sweden, had more weighty affairs upon her hands than to trouble herself much about Greenland, which at last proved the occasion of the total loss of that country.

GLACIERS OF CONTINENTAL ICE.



64
63
62
61
60
59

Part of the
COAST OF GREENLAND.



A Catalogue of Maps, Charts, and Plans, relating to Ireland, preserved amongst the Manuscripts in the Library of Trinity College, Dublin, with Preliminary Observations. By James Hardiman, Esq. M. R. I. A.

Read, April 12, 1824.

ALTHOUGH Ireland was known to the Greeks and Romans long before the commencement of the Christian era, yet it does not appear, that, until after that time, either of these powerful nations possessed any map or chart of this island. From the testimony of Pliny, it may perhaps be inferred, that such a document was contained among the topographical collections made during the reign of Augustus; but the oldest map of this country, now extant, is that of Ptolemy, with the contents of which every scholar is acquainted. The next, in point of antiquity, is a Roman map of the 5th century. This map, which is not so generally known, was discovered by Richard of Cirencester, who states that he travelled into Italy, and there transcribed an ancient itinerary, in which it was included, “*ex fragmentis quibusdam a Duce quodam Romano consignatis, et posteritati relictis.*” From Richard’s time it lay neglected in a Copenhagen manuscript, until found by Mr. Bertram; who, having ascertained that the transcript was 400 years old, published it, in octavo, Hafniæ, 1758. * The Rev. Charles O’Conor of Stowe,

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* This rare volume is in the Library of Trinity College. Mr. Bertram, in his preface, describes the map as most ancient; and says, “*raritate et antiquitate reliquum Ricardi commentarii longe superat.*”—*Prefat.*

to whose learned labours the ancient literature of Ireland is more indebted than to those of any other writer, observes, that "this map is not so accurate as Ptolemy's, but it is very valuable as an evidence of Roman ideas of Ireland in the 5th century. It also ascertains the fact, that the people called Scots and Attacots * were then known to the Romans as inhabiting the interior regions of that island."† As this interesting piece of antiquity seems to have escaped the observation of modern historians and statistical describers, an accurate copy is herewith given; which, with the assistance of Ptolemy, and the remains of the native writers whenever they shall be rendered accessible to the public, will be found useful in elucidating our ancient topography, and reconciling many apparent inconsistencies in our national history. Another, and no inconsiderable benefit which may be expected to result from these aids, is that of exposing the absurdities of some late system-makers; who, though little acquainted with the annals, and not at all with the language of the country, have obtruded their reveries on the world as genuine facts, thus adding no small degree of additional embarrassment to the investigator of historic truth.

That surveys of Ireland were made under the native Monarchs, before the arrival of the English, appears from some fragments still remaining. A passage in one of these surveys, by Fintan, in the 8th century, seems to indicate a map or pictured representation; but, if such a domestic document ever did exist, it has long since disappeared. Fintan's survey is quoted, as ancient, by the learned O'Duvegan in the time of Edward III. It is also mentioned by Sir James Ware, who says that it differs from the survey of Ireland laid down by Girald. Cambrensis in the reign of Henry II. but

* Properly *Athachtuatha*, Vide Dissert. on the History of Ireland.

† Cat. Bibl. MSS. Stowensis.

the latter, it must be observed, merely detailed the civil division as it stood in his time, founded on that of Fintan, or, as has been supposed, on another survey detailed in the annals of Multifernan ; a record which terminates in the year 1274, and which, on all hands, is admitted to be of unquestionable authority.

From the days of Henry II. to the reign of Elizabeth, the enquirer will seek, in vain, for any general or particular chart or plan of this distracted land. The incessant warfare kept up between the inhabitants of the pale and their surrounding neighbours, and the cruel and unnatural dissensions continually subsisting both among the British settlers and the native princes and chieftains, allowed neither time nor inclination for improvement: so that it was not until after the division of the greater part of Iréland into counties, during the 16th century, that any map or survey of an extensive nature, as far as I can at present ascertain, was made. Several, however, were then formed, many of which are now fortunately preserved in the valuable manuscript library of Trinity College, Dublin. Speed,* Blaeu, Ortelius, and others who published

* Speed, in his general map of Ireland, presents his readers with six portraits. 1st. Of a *wild* Irishman and woman ; 2d of a *civil* Irishman and woman ; and 3d of a gentleman and lady, all in the national costume of the time.—Though the subjoined abstract of a grant of James I. about this period, “to abolish the Irish habit,” be not strictly relevant to the present subject, yet the curious nature of its contents may, perhaps, excuse its introduction.—“The King, having an earnest desire to abolish all the rude and barbarous habits and fashions of the Irish, which had always made a kind of difference betwixt them and the civil English people of Ireland, and by the eye deceived the multitude, and persuaded them that they should be of sundry sorts, or rather of sundry countries, where indeed they were one whole entire body, whereof his Majesty was the only head under God ; and to the end that for ever hereafter, all his true and faithful subjects, Irish and English, might be the sooner induced to live together in sociable union, when the diversity of their apparel and habit should be taken away, and thereby the ruder sort might be drawn to amore civil kind of behaviour and manners ; his Majesty, in consideration of the pains and travails to be taken by Daniel Birne and Charles Hedley, gent. in reducing and compelling

imperfect, though in some particulars, curious maps of Ireland in the 17th century, if they consulted the collection alluded to, do not acknowledge the obligation. The late Doctor Beauford, whose exertions in this way are highly valuable, makes no mention whatever of these documents, which induces a supposition that he was not aware of their existence.* The same observation applies to Mr. Hyde Hall's elaborate treatise on the Down Survey, prefixed to the 2d vol. of Shaw Mason's Parochial Survey of Ireland; and it is to be regretted, that Mr. Arrowsmith had not the advantage of their perusal, before his splendid map made its appearance. Gratitude for facilities afforded in my literary enquiries by the Provost and Board of Trinity College, and a wish to extend a knowledge of these hitherto neglected or unknown muniments, led to the formation of the following catalogue, which has been favourably received by that learned and distinguished body. It is now respectfully submitted to the Academy, and should its publication prove useful to the historian, the statist, or local investigator, I shall feel abundantly

such as had used and did use to wear Irish mantles and bendles, to conform themselves in civil habit and apparel according to the gracious intention of King Henry VIII. and the good purpose of the founders of the Act of Parliament, 28^o Henry VIII. "intituled an act for the English order, habit and language," authorised and appointed them and either of them, their deputies and assigns, to take and seize to their own use, all such mantles and bendles as they should find or prove to be worn by any person, contrary to said act, within the provinces of Leinster and Munster, and the counties of Meath, Westmeath, and Longford, together with two whole third parts of all forfeitures, penalties and sums of money, imposed by the said act for using and wearing the same, reserving the other third part to the Crown. Term 7 years, April 19, 1613. (Patent roll, 11^o Jac. 1. 1^a. p. d. R. 24.)

* Though unwilling to deal in censure, I cannot avoid observing, that "The ancient topography of Ireland," and "A map during the middle ages," by William Beauford, A. M. printed No. 11. 3d vol. of Vallancey's Collectanea, are utterly unworthy of attention; being mere fanciful compilations, without any authority or foundation whatever. Beauford was an ingenious man, and, under judicious management, might have proved a useful one; but, in the present instance, he went, to use the mildest language, far beyond his depth.

required. At the present period, when a general survey of Ireland is spoken of, it may not be unimportant to direct the attention of those, who may be entrusted with the execution of this project, to every source of information which may tend to facilitate their labours, or lead to that accuracy which is so desirable in such a great national undertaking.*

* Several detached maps and plans, relating to Ireland, lie dispersed throughout the great repositories and libraries in England; particularly in the State Paper office, the Lambeth, MSS. and the Harleian and Bodleian collections. It would be desirable to ascertain whether any of these be anterior to the 16th century.



CATALOGUE

OF

MAPS, PLANS, &c.

RELATING TO IRELAND.



GENERAL MAPS, &c. OF IRELAND.

1. A manuscript map of Ireland, in colours, on vellum and illuminated, in the reign of Queen Elizabeth.
2. A MS. map of Ireland, on vellum, without date, but inscribed "To the moste honorable myne especiall goode Lord, the Earle of Salisburie, Lord High Treasurer of

Englande.”—Norden.—This map must have been made between the years 1608 and 1612. It contains the names, &c. of the principal proprietors or families then residing in the various districts of Ireland.

3. A M.S. outline of a map of Ireland, in an unfinished state.
4. A printed map of Ireland by Overden and Morden, London, inscribed to James Duke of Ormond, with descriptions taken from Speed.
5. Another map of Ireland, on a larger scale, printed in London, by Senex and others in 1711.
6. “ A sea chart of the coast of Munster, Leynster and Ulster, Irelande.” MS. in colours, on vellum, on a large scale. This chart appears to have been formed in the reign of Elizabeth.*

* An idea of the great improvement of Ireland, since the days of Elizabeth, may be formed from an inspection of these maps. The following extract of letters of James I. is made with the same view. “ The King being given to understand the great loss and hindrance which arose in Ireland by the multitude of wolves in all parts of the kingdom, did, by letters from Newmarket 26th November 1614, direct a grant to be made by patent, to Henrie Tuttesham, who, by petition had made offer to repair into Ireland, and there use his best skill and endeavour to destroy the said wolves, providing at his own charge men, dogs, traps, and engines, and requiring no other allowance, save only four nobles sterling for the head of every wolf, young or old, out of every county, and to be authorised to keep four men and twelve couple of hounds in every county, for seven years next after the date of these letters.” (Patent roll 12^o Jac. 1. d. R. 27.)

Ireland teems with mines, but the present maps do not, to my recollection, afford any information on this interesting subject. As it is one however of great importance, at present happily engaging much of the public attention, it is hoped that the following extracts from ancient documents, known but to very few, may be found to possess some interest.

In 1605 John Cutter and William Phillips, gent. petitioned James I. stating, that by their industry and expences they had found a mine of sea coals, in a certain ground near the river Shannon in Munster, (the particular spot not mentioned) and the king, “ minding the good of his realm of Ireland, that it might be stored with commodities of that nature, which now the inhabitants were fain to try and bring from other countries and parts to supply their wants, and also

PROVINCIAL MAPS, &c.

LEINSTER.

1. A map of the province of Leinster, with the city of Dublin described by Speed, 1610.

that his native subjects of Ireland, being much inclined to idleness, might be employed in labour," &c.—granted to said Cutter and Phillips, and their assigns, for seven years, sole license and authority, to dig for, find, and sell, said coals in any part of Ireland, or elsewhere beyond the sea. *Letters patent inrolled 3. Ja. I. 1. p. d.*—I pass over several grants from the crown, of mines of gold, silver, copper, lead, iron, tin, &c. at various periods of time, as the places are not, in general, mentioned. The following are more particular—13. Nov. 1627, the king directed the Lo. deputy to make a composition with Sir William Fenton and others, for all iron mines and iron oar, in, upon, and near, the mountains in the territory or country called Clangibbon, lying on the N. side of the river of Ardglin, in the counties of Cork and Waterford, and upon Roche's land near Bandon.—*Patent Roll 3. Car. I.* On 10 Nov. 1629, Sir William Fenton demised to the king, "all the iron mines now opened or to be opened, upon his part of the mountain of Glancounagh, in the territory of Clangibbon," *Pat. Roll, 5 Car. I.* 25 May 1672, the king granted to James Hamilton, Esq. the silver mines, smelting houses, &c. at Cnock-anderrig, Ballagowne, Clummagh or Downalty, within the barony of Upper Ormond, Co. Tipperary.—*Pat. Roll, 24 Car. II.*

The following is an extract from a paper of the reign of James I. preserved among the Harleian MS. British Museum, (4793)—Silver and copper mines of Ireland. There is a myne of allome in *Mac Morris's* country, 40 myles W. from Limerick; a silver myne in the isle of *Dorsay*; another in *Glennarach*, within the haven of *Ardech*, in *Mac Carthy More's* countrie; a copper myne at *Bantrie*, within Bear Haven; a led myne in Ulster, near *Ardglass*; led and copper mynes at *Mary*, three myles from Galway; at the *Fuire* of Irelands, a myne of ledd; in *Donald O'Flahertie's* countrie; 7 myles from Galway, led mynes; in the countie of Kildare, between Thomelin and the bridge of Leighlin, diverse unknown; in *Mac Loughlin's* countrie, by his castle, in *Borrein*, a silver myne, 16 myles from Galway; at *Clontarfe* a myne of led; at *Cloghrane*, beside *Malahidert*, a myne of led; at *Killenboy*, in *O'Brine's* country, diverse mynes of led and copper; at an island, called *Lindicke*, 60 myles N. W. of Galway, led mynes: at *Clonemena*, in the county of Wexford; at *Killegheag*, in the county of Kilkenny, at.....ne, against Waterford, at the..... a silver myne; same countie, a silver myne at *Cnock Dry*. Ibidem, in *Power's* countrie led. In Kerry two mines of silver, &c.

2. A manuscript plan of an encampment, without name or date. It appears, however, to have been in the neighbourhood of Dublin, from the outlet marks, as follow :—St. Steven's street waye—Colledge green waye—Baggatrough waye—Dunna-broke waye—St. Kevan's street waye ; and may have reference to the situation of the Marquis of Ormond's camp before the fatal battle with Col. Michael Jones, near Dublin, in 1649.
3. "A map of the King and Queen's County, Leax and Ophalye," in colours, on paper. No date, but evidently in the reign of Queen Eliz.
4. "The plot of the forte of Maribroughe," in colours, on paper, in the reign of Elizabeth, with the following note.—"The Queen's County consists of Leax, ancyehtlye O'More's lands, Slewmarge, inhabited alsoe by the O'Mores, Glanmalirie O'Demsie's country, part whereof is in the King's county, Iregan and O'Doyne's countrye."
- 5 "The Fort of Duncanon in the county of Wexford," in colours, on paper. No date, but apparently in the reign of Elizabeth. It contains a reference to the different parts of the fortification.
6. Sir Henry Harrington's defeate in the Berne's countrie, (neere unto Wickloe,) an^o 1599. This is handsomely painted on vellum, and contains a description of the progress of the engagement. It would form a very appropriate engraving for a general history of Ireland, or local description of the county of Wicklow.
7. "The taking of the Earl of Ormond in an^o 1600."—This is painted on vellum, and appears to have been done soon

after the transaction took place.—It is engraved in Ledwich's "Antiquities of Ireland."

8. An ancient draft of a fortification or encampment, without name or date. The following words occur "Curra first incampment."

ULSTER.

1. A MS. map of the province of Ulster, in the reign of Queen Elizabeth, in colours, on paper, with this inscription.—"A true description of the North part of Irelande, to weete from Dordagh, northwarde, comminge to the Deere or Iland of Ackel, with all the havens, bares, harbors and island rocks, sand, well set in their course, height and distance. The principal rivers, loughs, cities, fortes and abbies, compiled and done by Mr. Griffin, cocket master of the Queen's ship called the Tryemontayne, whereof is Capten, Capten Plasington, whoe have bene in all harbors, and have founde the depth, to see where any good road is. All the castles and fortes, wherein the garrison of Loughfoyle doth lye, are guilded; and where good roade is for shippes, the same is marked with an ancker, coated and done in their coullers and forme."
2. A large MS. map of "The province of Ulster," by Francis Jobson, with the following description, "The description and cemetrie of the province of Ulster, described and ploated for her Mat^e in anno 1590, by Francis Jobson, with such perfitt observacons, as the like before this tyme was never performed of that province. In the which ploat you

shall finde everie countie therein containd circumferenced with lynes of mettle couller, with their names in redd Roman letters, and everie countie in the saide counties containd is circumferenced and distinguished, thone from thother, and their name written in black Roman letters. Note that where you find this letter. C. It signifieth Castell. M. Abbie or monasterie. T. Tempell or church. B. Balle or towne. Note that the whole province is circumferenced with the lyne of mettle couller."

3. A map of "Ulster per Jobson," in colours, on paper; in the reign of Elizabeth, with the names of the principal proprietors of the province.
4. A map, in colours, of the province of Ulster, on vellum, in the reign of Queen Elizabeth, by Francis Jobson. This is a curious and apparently correct map of this province, and contains in the margin some references and descriptions of an interesting nature.
5. A small map endorsed, "A sea card of Ulster," on paper, reign of Elizabeth.
6. A printed map of the province of Ulster, and Eniskelling fort, by Speed, London 1610.
7. "A plott of the city of Londonderry," in colours, on paper, in the reign of James I, with a particular description of the fortifications, and a note, "That the whole number of houses within the cittie are 92, and in them is 102 families."
8. A large ground plan, on paper, of the city of Londonderry, intituled "The plott of the Derrie, 1611."
9. "The river of Loughfoyle with the city of Londonderry," drawn on paper, in 1625, by Thomas Raven."

10. The fort of Culmore.—This is handsomely painted on paper, but is without either name, date or reference.
11. “ The plot of Colerane,” in colours, on paper ; with a reference, in the reign of James I.
12. “ The plot of Dungiven in the countie of Colerane,” in colours, on paper ; in the reign of James I. This is but a fragment of a greater map, for a plan of the house and castle only remains, with this description, “ The house and castle of Dungiven, re-edified and built by Captain Dodington.”
13. A plan of the town of “ Cragfergus” or “ Knockfergus,” on a scale of 160 feet to the inch, in colours, on vellum.—This curious map is evidently of the reign of Q. Eliz. The names of several individuals appear over the houses and castles, of which, it is probable, they were the respective owners.—Vide M'Skimin's history of Carrickfergus.
14. A plan of the towne of Carigfergus, in colours, on paper ; about the reign of James I.—This is somewhat similar to the last map, but more copious ; the walls, ramparts, and other fortifications, being more perfectly described and delineated.
15. A map of “ the county of Fermanaghe,” in colours, on paper ; about the reign of James I. The following memorandum occurs on the back : “ This mappe, except M'Guire's country, called Fermanagh, is altogether false.”
16. “ The fort of Enishkillin in the county of Fermanagh,” painted on paper, in the time of James I. without either scale of dimensions or reference.
17. “ The King's plott at Lifford,” painted on paper, in the time of James I. with the following reference.—“ A. The Ramportt,

- B. The wall.—C. The ditche.—D. The counterscarpe.
—E. The wall of the counterscarpe.
18. "The plot of the countie of Monahan," in colours, on paper, in the reign of Eliz.
 19. "A plot of the fort of Balle-Loergan, Sir Edw. Blayne his undertaking, and the towne and castell of Monaghan," with references; both laid down on paper. They appear to be about the reign of James I.
 20. A large map of "The fort of Omaye in Ulster," in colours, on vellum.—No date, but appears to have been done in the reign of Elizabeth, or early in the 17th century.
 21. "A plott of the forte at Blackwater, as it was when the Lo. Burgh Lo. Dep. did wyn it from the traytor the Erle of Tyrone," painted on paper, with a note that "this fort is 200 paces long and 40 paces within the bawne," and a memorandum concerning the O'Neils.
 22. "The defeate of the Marshall, Sir Henry Bagnall, in anno 1598, at the Blackwater," painted on paper with 22 references, and the following heading, "The description of the army which was defeated by the Erle of Tirone the [] of August 1598."—Part of this document appears to have been cut away, which was, probably, a description of the battle.

MUNSTER.

1. A MS. map of the province of Munster, in colours, on paper, dated 30th May 1589; and inscribed to Lord Burleigh, by Francis Jobson, with a very curious description of the map and country.

2. "The province of Munster in Ireland," in colours, on paper, without name or date; but is, to all appearance, of the reign of Elizabeth.
3. A printed map of the province of Munster, with the city of Cork, painted, and laid down on canvas, by Speed, London 1610.
4. "The plot of the town of Bandon Bridge in the countie of Corke, as it is intended to be buylte, beinge seated in the baronie of Kinalmekie, within countrie," in colours, on vellum, and drawn by Christopher Jefford. The year 1613 is inscribed on military colours displayed over one of the west tower gates, and the initials R. B. underneath, denoting Sir Richard Boyle, afterwards called "the great Earl of Cork," the founder of the town.
5. "The plot of the gate already neere fynished at Bandon Bridge, and of the other two gates or castles; all, saving the uppermost rooms with three castles, will cost me £2500 or upwards."—These are contained in three small leaves, attached together. No date, but the foregoing inscription, it is probable, is in the handwriting of Richard Boyle, the first Earl of Cork.
6. A curious map, or "Plott of the towne of Bandon Bridge for my Lo. Carew, before it was finished."
7. "The towne of Bandon bridge, as it is now built," laid down on paper, on a large scale.—This map was formed soon after the last.
8. A large MS. map, in colours, on vellum, of the county of Cork.—No date, but appears to have been made about the reign of Elizabeth.
9. A map of the barony of Imokilly in the county of Cork, in

colours, on vellum, in the reign of James I, with the names of the principal freeholders of the barony.

10. A MS. map, in colours, on paper, laid down on canvas but much worn; with the following heading, "A description of the cittie of Cork with the places next adjacent, 1602."—This map contains the following references.—"A. Christe's church—B. St. Peter's—C. Our ladie's church—D. St. Franciss, an abbey—E. The pidgeon house—F. Shandon castle—G. Thabbey of the Isle—H. St. Barry's church—I. The spire—K. St. Stephen's church—L. St. Augustine's, an abbey—M. Hollyroode church—N. The bishop's house—O. Gally abbey—P. The new forte.—Q. The forte in the entrance of the marsh—R. The marsh.—S. The walk about the marsh—T. The high way to Youghall—V. The high way to Mallo—W. The high way to Kinsale—X. The high way to the Passage and the Black rock—Y. The high way to Goggin's towne—Z. The high way to Muskery."
11. The towne of Corke in Ireland, in colours, on paper.—This seems to be about the reign of Elizabeth.
12. The "new forte at the south end of Corke," painted on paper, and drawn on canvas.—Neither name nor date.
13. Plan of "The forte intended at Corck, on the north side."
14. "A fort at Corke, now destroyed, erected by Sir George Carew Lo. president of Munster," painted on paper, on a scale of 16 yards to an inch, with references.
15. "The new forte at Corke, erected by Captain Nicholas Pynnar, in 1626."—Painted on vellum, with part of the city and walls of Cork, and a description of the fortification annexed.

16. Plan, painted on paper laid down on canvas, of "the forte of Hale-Boulinge, in the island of Ennis Shenagh, (Fox Island,) near Corke."—No date, but has every appearance of being of the reign of Elizabeth.
17. "The fort at Halboulyn by Paull Ivey," drawn on paper, with a description of the fortifications, in the reign of James I.
18. "The forte of Castle parke near Kinsale," painted on paper.—This and the plans of the forts at Waterford and Cork, appear to have been done at the same time.
19. "The haven and river of Kinsale," painted on vellum, in the reign of Queen Elizabeth.
20. A draught of the fort at Castle park near Kinsale, by Paul Ivey, on paper.—This appears to be about the reign of James I.
21. A large map, in colours, on vellum, indorsed "A Survey and description of the county of Limerick," with the following note, "The plott of the great county of Limerick, conteyning therein the county of Cowlo-Kenry, Cosmoy, Publybrian, Clanwilliam, Slewiliam and the small county of Limerick. Every particular part is distinguished with a pricked lyne, whose several names ye shall finde within the said lynes in Romaine letters. Also you shall finde the plott formes, with the just proportion, and simitre of all the perticuler percells of grounde, as I have surveyed and measured, of her Mat^{ies} lands escheated within the saide county. All which perticulers is severally circumferenced with redde colours, and all such freholds adjacent circumferenst with yellow, and the Queen's demaynes in lease circumferenst with greene; all the rest of the Queen's lands, escheated within

the said county, in this plott is not as yet placed.”—Neither name nor date, but appears to have been done by Jobson.—
Vide No. 2. Ulster.

22. “The citie of Limrick,” A MS. map, in colours, on vellum. No name or date, but it appears to be of the reign of Queen Eliz. and being very similar in its appearance to the Map of Cork, No. 10. already described, was very probably made at the same time. It contains the following references.—“A. St. Marie’s church—B. The Queen’s castel—C. The Kaye—D. Thomond Bridge—E. St. Moghin—F. Tide Bridge—G. St. Nicholas—H. St. Dominick—I. St. Mary house—K. St. Francis—L. The high street—M. The kaye lane—N. Thomond gate—O. The Island gate—P. Newgate—Q. The bishop’s house—R. Thomas Arthur’s mil—S. The Queen’s mil—T. Nichola’s Arthur’s mil—V. The common mil—W. St. Michael’s church—X. St. Peter’s, a nunnerye—Y. The old College—Z. The Beadle’s house—AA. Mungret street—BB. St. John’s church—CC. Creagh lane—DD. Tenkin’s lane—EE. Tolsel lane—FF. Hemlin’s lane—GG. Bonfield’s lane—HH. Monke’s lane—II. The abbeye lane—KK. St. John’s port—LL. St. Michael’s port—MM. Mungret port—NN. The way to Kilmallock—OO. The way to Thomond.”
23. “A rough plott of Limerick, per Sir Ri. Greenville,” with “his opinion for the fortifeinge of it,” drawn on paper in the reign of Elizabeth, or James I.
24. “The castle at Limbrick.”—A rude sketch of King John’s castle at Limerick, with Thomond bridge over the Shan-

non; painted on paper, in the reign of Elizabeth, with a reference.

25. "The castle of Glynn in the county of Lymerick, taken by Sir George Carew, Lord presind. of Munster."—A large map in colours on vellum.—It is further intitled, "A description of the Glin taken by her Mat^{ies} forces, the 7 and 8 of July 1600."
26. "The castle of the Glin," painted on paper, laid down on canvas, with this note, "A description of the plot of the Glin taken by her Mat^{ies} forces under the command of the Right hon. Sir. George Carew knt. Lord president of Munster, the 7 and 8 of July 1600."
27. The towne of Kilmallock in the county of Limerick, per Joanes, in colours, on paper, laid down on canvas.—The towne is surrounded by walls.—The following are the references.—
 "A. St. John's gate—B. The Q. castle—C. The Friar's gate—D. St. Dominick's—E. St. Peter and Paul's church—
 F. The water porte—G. Ivy port—H. Bla porte—I. The high way to Malo—K. The high way to the White knight his country—M. The high way to Limerick.—N. The high way to Botevant."—This map appears to have been formed about the same time as those of Limerick and Cork.
28. A plan of "The River of Shenon," in colours, on paper, about the reign of Elizabeth.*—This plan embraces from the

*And probably at the time Sir Edward Waterhouse was appointed "Supervisor of the Shannon," an office once of great trust and emolument, but now forgotten.—The following curious extract from his appointment is the best comment on this map.—On 7 July 1588, Q. Eliz. by her letters patent, (in consideration of the good services performed by Sir Edw. Waterhouse knt. and that at his own expence he should keep and maintain, yearly, four great boats, skips, or

mouth of the Shannon to Castle Connell, and ends “ wher the leape is that hinders the bootes to pass up to Olone,” (Athlone.)

29. “ The new description of the cittie of Waterford with the new fortification there. Also the fort of the Rock, the true course of the river, the new work at the Passage, and of the fortification at Duncannon, erected in 1591 ;” in colours, on paper, by Francis Jobson, in 1591
30. Plan of the fort at Waterford, on paper, apparently in the reign of James I. with this title, “ The forte as it is to be made at Waterford.”
31. “ The new fort at Waterford erected by Captain Nich. Pynnar in 1626,” painted on vellum ; with part of the town

Gallies, well built and fitted out, and under his custody, continually to be employed in the Queen's service upon the said river, for the transporting of men, Soldiers, Munition and provisions, as well from the West as from the East side of the river, to the countries or several territories following, viz. Orwarke (O'Rorke,) O'Farrole Boy, O'Ferrall Bane, O'Melaghlin, M^cCochlane, the M^cEgans, O'Carrols, Ormond, the three branches of the O'Kenides, M^cIbrien Arra, the O'Mulrians, M^cIbreine O'Gownagh, and Ricard-more of Glanwilliam on the E. part; and the countries and lands of M^cDermott, O'Breine, O'Connor-Roe, O'Connor-Doyne, the O'Kellies on the E. side of the River Suck; the O'Kellies on the W. side of said river, O'Madden, Ricard-more, the O'Gradies, M^cNamara, and the Brines on the W. side of the Shenin; or any other parts, territories, places or countries on each side of said river, where navigable,) granted to him the said office of Supervisor, Guardian, Water-bailiff and Keeper of the entire river of the Shenin: TO HOLD, with the boats, from 30th June last, during his life, with the fee of 2s. English a day for the support and maintenance of two Masters or Commanders of the said four vessels or boats, and 8d. a day, a peece, for thirty other servants to attend upon him about the same service. And because the Wears erected on the said river might very greatly hinder the Water-course thereof, and the passage of her Majesty's subjects, in hazard of their lives, she granted him a power, from time to time, to break and destroy all the said Wears, (those belonging to her Manor of Athlone and the Abbies there excepted,) if they were made contrary to the Statute in that case provided; and power to hinder all boats from plying, which should be carrying provisions, &c. to her enemies, and to seize the same.—*Inrolled 30th Eliz. f.*

and walls of Waterford, and a description of the fortification annexed.

32. A plan of the town and port of Youghall, in colours, on paper, laid down on canvas.—This is in the same stile, and most probably was done at the same time with those of Limerick and Cork, before described. It contains the following references.—A. The Church—B. The College—C. The north gate—D. The south gate—E. The kaye—F. The abbey on the No. West side of the town—G. The abbey on the So. West side of the town—H. The highway towards Cork—I. The Harbòrough—K. The Passage—L. The Base Town—M. New Kinsale—N. Pil Town—O. The highway to Dungarvin.
33. A square plan of a fortified town, surrounded by trees and water, with a number of houses near the right angle. This plan has neither name nor date, but is very likely one of the towns planned out by the Earl of Cork, in the south of Ireland.
34. Another plan of a fortified place without name or date. The following inscription beneath. “ A profile of the largence of the rampart, and moat or entrenchment of the Campe in feete.”
35. A draught of a fortification.*

* At Lambeth there are several maps relating to Munster, particularly the counties of Desmond and Kerry. There are many others in the office of his Majesty's papers, (formerly at Whitehall, now in Great George's street, Westminster,) including “ soundings of the Havens in the west of Munster,” &c.

CONNAUGHT.

1. A. large MS. map of the province of Connaught, in colours, on paper laid down on canvas, and made "from a view of the countrie," divided into counties and baronies, and noting the principal towns, rivers, woods, mountains and other noted places.—This map is not dated, but it appears to have been made about the end of the reign of Queen Eliz. (after the division of this province into counties in 1585 by Sir John Perrott,) or beginning of that of James I.
2. A. MS. map of the province of Connaught, laid down on canvas. The counties, baronies and parishes are marked. No date.
3. A printed map of "The province of Connaught with the citie of Galway described," by Speed, London 1610.
4. "The fort neere Galway," handsomely painted on paper, about the year 1603, with a reference.
5. "The plott of Gallway with the layinge out of the new fort." This was done about the year 1625, and is painted on paper on a large scale.
6. A large engraved map of Galway, about the time of the Restoration of Charles II, in a case.—For a particular description of this curious map see the History of Galway.

The following MS. maps and plans, relating to Ireland, are mentioned to have been amongst the foregoing, but I could not find them when forming the catalogue. viz.—1. The fountains and

outlet of the rivers of Shower, the Newer and the Barrow—2. The counties of Kerry and Desmond—3. A map of Muskerry in the county of Cork—4. Berehaven and Bantry—5. A map of Baltimore in the province of Munster—6. A plott of the siege of Kinsale in Ireland—7. Part of the counties of Armagh, Down, Tyrone and Antrim in Ulster—8. The county of Londonderry—9. The haven of Loughfoile in Ireland—10. A plott of the fort of Balleleorgan.*

* The printed maps of Ireland are numerous. Of these we are informed, *Cat. MSS. Stow. Vol 1. p. 216.* that the most curious is Mr. O'Connor's, containing the names of the ancient proprietors. The original copper-plate of this popular map is in the collection of the writer of this article, in perfect preservation.—On the subject of our printed charts and maps, much valuable information may be anticipated from the learned Bibliographical researches of the Rev. Edward Groves, the result of which will shortly appear before the public, in his "Irish Historical Library," now at Press.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in financial reporting.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the tools used for data collection.

3. The third part of the document presents the results of the study, including a comparison of the different methods and techniques used. It discusses the strengths and weaknesses of each approach and provides a summary of the findings.

A Sketch of the History and Antiquities of the Southern Islands of Aran, lying off the West Coast of Ireland; with Observations on the Religion of the Celtic Nations, Pagan Monuments of the early Irish, Druidic Rites, &c. by JOHN T. O'FLAHERTY, A. B.

Read January 26, 1824.

SECTION FIRST.

PRELIMINARY THOUGHTS.

IF the Islands of Aran had formed a portion of the Hebrides or Orkneys, or stood in view of any part of the British coast, they would, long since, have been made the theme of the statistic and sentimental tourist; but, though abounding with many particulars, valuable to the Antiquary, Historian and Philosopher, they have been hitherto neglected, in common with other interesting districts of Ireland. The reader will, however, see that the topography of these Islands deserved far better attention.

To this species of inquiry the Scots have been particularly attentive. What minute descriptions have we not had of all their isles, even to the naked rock? The dreary and almost inaccessible St. Kilda, scarce three miles long, has been twice described in print; first by Martin; next by Macaulay. In a word, the most insignificant spot has been carefully surveyed. We learn from regular statistic returns,

that, on the west coast of Scotland, there are sixty-eight islands, comprising a population of one hundred thousand, equal to one third of the population of the Highlands.

Of the numerous islands, surrounding a country such as Ireland, 800 miles in circumference, we know nothing in the way of distinct and useful detail. This important expanse of territory has been consigned to the meagre lines of a general map, or to the imperfect notice of our few county historians, or perchance to the telescopic glance and empty pleasantry of some fashionable and superficial tourist.

When one considers the vast extent of our line of coast in all its windings, the importance of an inquiry into the number, population, and actual state of the surrounding islands strikes the mind with augmented interest. 'The sinuous line of its sea coast,' says Mr. Newenham, 'exclusive of such parts as lie within estuaries, or above the first good anchorage in every harbour, but inclusive of the river Shannon, as far as the tide reaches, and the shores of Bantry Bay, Dunmanus Bay, and Kenmare River, will, if accurately followed through all its windings, be found to measure 1737 miles. In this line there are not fewer than one hundred and thirty harbours, and places where ships may anchor for a tide, or find shelter.* Exclusive of those which lie within great bays, there are nearly one hundred inhabited islands.† 'Most of these,' observes Mr. Anderson, 'are said to be fertile; some of them, as the *Isles of Aran* off the coast of Galway, the Island of Valentia, and the Maghera Islands off the coast of Kerry, surprisingly so. The number of inhabitants, throughout these islands, is unknown; but it must be very considerable. The population of one only of

* View of Ireland, 4to. London, 1809, p. 6.

† To. p. 11.

them is said to be greater than that of the largest of the Hebrides.* Such are the opinions of an intelligent Scotsman. They shew the interest strangers can take, even to minuteness, in our neglected topography—and they ought to excite, one would suppose, an active spirit of inquiry among ourselves. The present account of the Isles of Aran is an humble commencement—calculated, it is hoped, to manifest to our learned Societies, and to the State, the utility of publishing accurate Surveys of the islands situated on the Irish coasts. I believe Government contemplates a general Survey of Ireland, including all the islands; and, I trust, that this national project will be thoroughly and speedily executed.

We may, on a broader view, be allowed to observe, that islands, generally, supply the most satisfactory means of archaiological acquirement. They have been the early retreats of the peaceful, the contemplative, and the learned; sequestered and undisturbed, they have preserved much of the moral and physical remains of the ancient world. In these retired abodes, almost cut off from social innovations, we frequently meet the most genuine monuments of antiquity, including whatever is primitive and unmixed in the existing dialects, manners, and institutions of the continental nations. Crete was the famed nursery and school of the Titan Kings—and Mona the distinguished seat of Druidic learning. In antiquity and respectability of name, colonization, and character, these celebrated Isles are not superior to Ireland—the *Ierne* of Aristotle—the *Ogygia* of Plutarch—the *Sacra Insula* of Avienus. Gaul, Spain, Britain, and the other Celtic states, have lost all their records of remote antiquity; Ireland has lost some; but she has also preserved some, unquestionable in historic evidence, and illustrative not only

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* Memorial, &c. p. 33.

of her own antiquities, but, in a great measure, of those of Europe. Yet this rich mine has never been worked with skill or effect; and Ireland is, to this day, without what may, with propriety, be called a **HISTORY**. Every attempt, in that way, seems to be in the extremes of partiality and praise, or of prejudice and vituperation. In the former case, the native writer cared not to separate fable from fact; in the latter, the purpose of the colonist was misrepresentation. It was with Ireland, as with Carthage—the far greater part of her self-called historians, since the days of the first Plantagenet, were her determined foes.

The subject of these sheets is too limited to give extensive scope to the historian's labours; it presents, however, a sort of miniature of a general history, which may not prove quite unimportant. Like Ireland, Aran had been called "the Isle of Saints," so celebrated had it been for sanctity and learning. The Isles of Aran still exhibit abundant evidence that they had been successively selected as a favourite residence of the Pagan and Christian priesthood; here too the original manners, customs, and language are peculiarly preserved.

SECTION SECOND.

NAME, SITUATION, AND EXTENT OF THE ISLES OF ARAN.

In primitive languages, proper names are always descriptive of some moral or physical characteristic in the person, and of some peculiarity in the place, designated. Hence the essential aids, which etymology and history mutually confer. In conducting this operation, however, arbitrary and far-fetched etyma must be cautiously avoided.

The cluster of islands, generally called Aran, are thus particularly enumerated:—Aran *Mor*, or the Great Aran—*Inismeane*, or the Middle Island—*Inisur*, or the *Eastern Island*—*Straw Island*—*Branach Island*—and *Illane Eachach*, or the *Western Isle*.

Aran, so far as I can collect, means lofty or mountainous in the Gaelic. Several mountains in Ireland, Scotland, and Wales, are so called. This name is not peculiar to the place now under consideration. There is an Island, so called, on the north coast of Ireland, near the county of Donegal; it is termed, for distinction, “North Aran.” There is also the Isle of Aran on the west coast of Scotland. It is reasonable to suppose, that, in each case, the appellation had been given by early settlers, holding a community of language and origin. With respect to the Western Isles, or Hebrides, it is no longer denied, since the dreams of the Macphersons and their few associates have passed by, that they and the Highlands were colonised in the third century, and re-colonised early in the sixth, by the Scots of Ireland, to whom history traces the name of *Scotia*, together with her long and illustrious line of Kings, of the Dalriadic stock. Of that ancient line our present Sovereign is the representative and descendant, by SOPHIA of Hanover, the daughter of ELIZABETH of Bohemia, the daughter of JAMES the First of England and Sixth of Scotland.

The Islands of Aran lie on the west coast of Ireland, at the mouth of the Bay of Galway, about ten leagues to the west of that port, stretching south-east and north-west—*Lat.* 52 to 53 :—*Long.* 9 : 30 to 9 : 42.* These islands constitute a half barony,

* A modern historian, whom I shall have occasion to name presently, is minute in describing the situation of Aran Mor. ‘It bears,’ he says, ‘by compass, from Hog’s-Head, N. by W. $\frac{1}{2}$ W. 16 miles; from Guilen-Head, S. $\frac{1}{2}$ W. about 8 miles; from Black-Head, within the bay of Galway, W. by N. $\frac{1}{2}$ N. 18 miles; and from Mutton Island, near the town, W. $\frac{1}{2}$ N. distance 29 miles.’

Moycullen in the county of Galway being the other half, and belong to the Rectory of Tuam. They are computed to be about 12 miles long, and between 2 and $2\frac{1}{2}$ miles in main breadth, intersected by straits, two or three miles broad; their appearance is irregular, the Isles being indented by a number of small bays, some of which are considered safe harbours, even for vessels of burden.

SECTION THIRD.

ANCIENT CIVIL HISTORY.

These Isles, according to the Irish annals, were successively tributary to the Belgian and Damnonian Kings of Connaught long before, and for many centuries after, the arrival of the Scottic colony from Spain. According to the Book of Conquests, an Irish record so called, (*Leabhar Gabhala*) on the invasion of Ireland by the Damnonians, named in our annals *Tutha de Danan*, and after their victory at Muireadh over the Belgians, or Firbolg, a part of the latter colonists fled to the Isles of Aran and other isles on the western coast; where they remained undisturbed, until the period of their expulsion by the *Cruithnigh*, or Picts of Ireland, not long after the provincial division of the entire country. How long these Picts were in possession of Aran, does not appear to be clearly ascertained. It is certain, however, that they were succeeded in that territory by a Damnonian tribe, patronimically called *Clan-Huamoir*, whom we find in possession of it down to the middle of the third Christian century. At that time, the Irish Picts, assisted by their brethren of North Britain, and by the Damnonians, were engaged in a formidable rebellion against the Irish Monarch,

Cormac ; who, after experiencing much adverse fortune, finally succeeded in subduing his rebellious subjects. The Damnonians lost all their power and possessions in Connaught and the neighbouring isles ; the Irish Picts were banished ; and the victorious king carried the war into the country of the British Picts, where he planted an Irish colony, led by his relation, *Carbre Riada*, the *Reuda* mentioned by Bede. To this martial Prince the royal Dalriadic dynasty of Scotland traces its parentage and its name.

After the irretrievable defeat of the Damnonians, in the battle *Moy-ai*, in the present county of Roscommon, *Cormac* transferred the Sovereignty of Connaught on his half-brother, *Niamor*, who being slain by *Aodh*, the deposed prince, the principality, by a decree of the monarch, became subject to *Lugad*, the brother of *Niamor*. It further appears from our annals, that two chiefs, *Aengus* and *Concovar* of the *Huamor* Sept, possessed the Isles of Aran, in the time of *Maud*, queen of Connaught, whose reign was not long anterior to the Christian era. Of these chiefs there are still unequivocal memorials ; one in the Great Isle of Aran called *Dun Aenguis*, “ the fortification of Angus ;” the other in the Middle Isle, traditionally called *Dun Concovair*, “ the fortification of Concovar.” These extraordinary remains of ancient military architecture shall be described hereafter.

Among the early tribes, who had fixed in Aran, we meet mention of *Siol Gangain* ; and Ptolemy clearly places his *Gangani* in or about these isles. It is more than presumable, that these are the *Conceni* whom Orosius traces in Cantabria,* calling them, as Camden remarks, *Scyths*, or *Scots*. Silius † and Mela ‡ agree with Orosius. The three were natives of Spain ; and one of them

* L. 1. c. 15. † L. 3. ‡ De situ Orbis l. 2. c. 6.

wrote before Ptolemy, who makes no mention of the Concani or Gangani, as settlers in Britain. Whitaker, * and Pinkerton † deny that such a tribe inhabited Spain; but are we to prefer their unsupported negative to the authority of ancient Spanish writers of high repute? This may be digression; but, so far as it goes, it strengthens the invariable evidence of our annals, on the subject of a Scottish migration from Spain to Ireland. In the whole range of remote antiquity, no historical affirmation appears better attested; as I shall soon shew in another work, now in preparation for the press. The early inhabitants of Aran were, it is true, of the Belgic and Damnonian stock; but, so late as the middle of the second century, Ptolemy's time, it is by no means improbable, that a Scottish clan had also settled there. The Scots had possession of Ireland many centuries before that period.

Archbishop Usher affirms, that *Æengus*, the first Christian King of Desmond, or South Munster (comprising the county of Cork and certain adjacent parts of the counties of Kerry, Tipperary, and Waterford) had bestowed, at the request of *St. Ailbe*, the Isles of Aran on *St. Einea*, called also *Endeus*; and it does not appear that the learned Primate's opinion has been contradicted. One would, however, incline to think, that, on the expulsion of the old inheritors, in the third century, these islands had got into the possession of the Princes of Thomond, or North Munster, (anciently comprehending the counties of Clare and Limerick, with a considerable part of the county of Tipperary) rather than into that of the princes of South Munster. Locality, at least, would favour this conjecture. Both these princely stocks of South and North Munster (Mac Carthy and O'Brien) were of one lineage, their

* History of the Britons, Dublin, 1773, p. 142.

† Inquiry into the Hist. of Scotland, v. 2. p. 5 and 212.

common progenitor, *Oliol Olum*, having died in the supreme sovereignty of all Munster, about A. D. 260. From his eldest son, *Eoghan*, were descended the great families of Desmond, called after him *Eugenians*; from his second son, *Cormac Cas*, came the great families of Thomond, called after this progenitor, *Dalcassians*. Moreover, we find, that these isles were possessed by the O'Briens, from time immemorial, and down to the reign of Elizabeth. These occupiers were known by the name of *Clan Teige Aran*, yet, as there is no positive evidence against the pious grant, ascribed to King Aengus, we may perhaps safely admit it as an historical fact. Certainly, there are two considerations in its favour. First, the Kings of South Munster were far more powerful than those of North Munster, until the time of the great *Brian Boroimhe*, the Alfred of Ireland; that is, until the tenth century. In the next place, Aengus and St. Einea were cotemporaneous. The latter founded in 480 * the famous abbey called after him, the remains of which are still to be seen in the larger Isle of Aran. Aengus died in 489 according to the annals of the four masters of Donegal—in 492 according to the annals of Inisfallen—in 490 according to O'Flaherty. He was the son of *Nadfríoch*, the son of *Corc*, the son of *Oliol Flanbeg*, the son of *Fiacha Muillechan*, the son of *Eoghan*. These latter particulars are given, in order to show how careful the Irish were in preserving the pedigrees not only of their supreme Kings, but also of their tributary Princes: a practice which powerfully contributed to sustain a faithful system of Chronology.

In 546, it was agreed between the Kings of Munster and Connaught, that the islands of Aran were to acknowledge no superior or pay chief rent to any but their native Princes.

In 1081, the great island was destroyed by the Danes, as the an-

nalists of Inisfallen record. *Arain na Naoimh do lusgadh le Lochlanmaibh.*

For the civil history of these isles from the sixteenth century to the present time, and other valuable information, I am indebted to the indefatigable researches of the historian of Galway, James Hardiman of Dublin Esq. whose zeal in restoring the ancient records and literature of his country, is deserving of the highest praise.

The old records of Galway attest, that the inhabitants of that town, were, from a remote period, on terms of close friendship and alliance with the Sept of *Mac Teige O'Brien*, hereditary lords of Aran; both parties being bound to give mutual aid, in all cases of emergency. This league, however, did not save the islanders from the violence of the Lord Justice, Sir John D'Arcy, by plunder, fire, and sword, when sailing round the western coast of Ireland, in 1334, with a fleet of fifty-six sail.*

Not long before the year 1575, James Lynch Fitz Ambrose of Galway, merchant, obtained a Mortgage of the islands of Aran from *Morchowe Mac Tirriligh Mac Donill*, chief of the *Clanteige of Aran*. In June 1575, it was agreed among them, "that, in case the said Sept of Clanteige had deceased and perished, the said mortgagee should be their sole heir, and possess Aran and their whole lands." It appears, however, that "*Teige Etrugh, Morchowe Morowe, Conchor Mac Morchowe, Terrilagh Meeagh, Teige Mac Terrilagh, Dermod Mac Morchowe, Teige Mac Terrilagh Oge, and Chonchor Mac Moriortagh Brene*, gentlemen, all of Aran, and *Dermod Mac Cormack Mac Concher*, of the Castle of Trowmore, on 14th of July 1575, appointed Captain Morchowe

* Clynne's Annals.

Mac Terrilagh Mac Donill their attorney, for ransoming the Isles of Aran from James Lynch; and agreed, that all such parts, as he should so ransom, should belong to him and his heirs for ever.”—*Corp. Book of Galway. A.* Late in the sixteenth century, the O'Briens were expelled from the islands by the O'Flaherties of Iar-Connaught. Upon information of this transaction having been received by Queen Elizabeth, a commission issued, which declared, that the islands belonged to her Majesty in right of her crown. She accordingly, by Letters patent, dated 13th January 1587, granted the entire to John Rawson, of Athlone, gentleman, and his heirs, on condition of his retaining constantly on the islands, twenty foot Soldiers of the English nation,* On this occasion, the Corporation of Galway addressed the Queen on behalf of the O'Briens, but without effect. The address was signed, on the 30th of March 1588, by John Blake, the Mayor, and Walter Martin and Anthony Kirrivan, bailiffs, and countersigned by Anthony Dermot, Notary; whereby they testify to Queen Elizabeth in favor of Murrogh Mac Turlagh O'Brien, there living,—that the Mac Teiges of Aran, his ancestors, were, under her Majesty and her predecessors, the temporal captains or lords of the islands of Aran and their territories and hereditaments elsewhere,† under the name of Mac Teige O'Brien of Aran, time out of man's memory; and that they had seen the said Murrogh Mac Turlagh authorised by all his Sept, as chief of that name, and in possession of the premises as his own lawful inheritance, as more at large, say they, doth appear in our books of record, wherein he continued, until of late he was, by the usurping power of the O'Flaherties, expelled, from whom it is taken

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* Rot. Pat. 31 Eliz.

† They were also Lords of the territory of Tromra, in Thomond.

by some inquest found in her Majesty's favour. They add—"we say moreover, that the Sept of Mac Teige O'Brien of Aran, since the foundation of this city and town, were aiding and assisting to ourselves and our predecessors against her Majesty's and her predecessor's enemies, in all times and places whereunto they were called, as true, faithful, and liege people to the crown of England, to maintain, succour, and assist the town."

All was in vain: Elizabeth continued inexorable. It is more than probable, that the O'Briens had to ascribe, at least remotely, this alienation of their inheritance to their own domestic feuds. At the north extremity of the larger Aran, not far from port Murvey, the islanders shew a field, where human bones and skulls are frequently dug up, and for which reason it is called *Faran-na-ccan*, "the field of skulls." Here the O'Briens are said to have, at some remote period, slaughtered each other almost to extermination. This sort of self-destruction is the largest and impurest blot on the page of Irish history: it always has been, and alas! continues to be, Ireland's sad and inalienable inheritance.

Not long after this transfer made by the Queen, Sir Robuck Lynch of Galway became proprietor of the Islands. The following instrument is dated the 20th June, 1618. "Indenture between Henry Lynch of Galway Esq. and William Anderson of Aran, county of Galway, Gent.—Whereas Queen Elizabeth, 21st Nov. 1586 (29th) demised to Sir Thomas Lestrangle Knt. in reversion after the determination of a lease made to Robert Harrison for 50 years, all those 3 Islands late parcel of the possessions of the late religious houses of Finbour, Anaghcoyne, Kyleseanye, and Corcomore, whereof the 1st is called Aranmore, containing by estimation 16 acres, the 2d called Innyshmany alias Inishmain, and the 3d called Inisharye alias Inisserre or Inisharry, the one moiety

whereof was come by some assignment to the said William Anderson during the residue of Sir Thomas Lestrangle's 50 years lease, being 36 years from the 13th August last, said Henry Lynch by this Indenture, for the sum of £50 English, and for the better assuring and confirming the said moiety to the said William Anderson, demised and assigned all the said moiety of the said three Islands to him, excepting great trees, mines, minerals, and great hawks, at the rent of £3 Irish, or a proportion of port corn, as therein mentioned."*

The Clan Teiges still claimed the islands, as their legitimate inheritance. Taking advantage of the troubles in 1641, they prepared to attack the people of Aran, with the aid of a Gentleman of considerable property and influence in the county of Clare, Boetius Clancy, the younger. Their project, however, was frustrated by the opposition of the Marquis of Clanricarde and the Earl of Thomond.†

In 1651, when the royal authority was fast declining, the Marquis of Clanricarde resolved to fortify these islands; where he placed 200 musketeers, with officers and a gunner, under the command of Sir Robert Lynch. The fort of Ard kyn, in the great island, was soon after repaired and furnished with cannon; and, by this means, held out against the parliamentary forces near a year after the surrender of Galway. In December 1650, the Irish, routed in every other quarter, landed 700 men here, in boats from Iar-Connaught and Inis-Bophin. On the 9th of the following January, 1300 foot, with a battering piece, were shipped from the bay of Galway to attack them; and 600 foot more marched from the town to Iar-Connaught, to be thence sent, if necessary, to the assistance of the as-

* Patent Roll.

† Clanricarde's Mem. p. 71.

sailants. On the 13th the islands surrendered, on the following “ Articles, concluded between Major James Harrison and Captain William Draper, on behalf of Commissary General Reynolds, Commander in chief of the parliamentary forces in the isles of Aran, and Captain John Blackwall and Captain Brien Kelly, Commissioners appointed by Colonel Oliver Synnot Commander of the fort of Ardkyn, for the surrender of the said fort.—1. It is concluded and agreed, that all the officers and soldiers, both belonging to sea and land, shall have quarters, as also all others, the clergymen and other persons within the fort.—That they shall have six weeks for their transportation into Spain, or any other place in amity with the state of England; and that hostages be given by Colonel Synnot for the punctual performance of these articles.—3. That Colonel Synnot shall deliver up the fort with all necessaries of war, by 3 o’clock this instant 15th January, 1652, before which time all officers and soldiers belonging to the said fort shall march, with drums beating, to the church near Ardkyne, and there lay down their arms.—4. That Colonel Synnot and the Captains, eight in number, shall have liberty to carry their swords; the other officers and soldiers to lay down their arms; that Commissary Reynolds shall nominate four officers of the fort hostages.—5. That Colonel Synnot, with the rest of the officers and soldiers, and all other persons in the fort, shall, upon delivering their arms and delivering their hostages, be protected from the violence of the soldiers, and with the first conveniency be sent to the county of Galway, there to remain in quarters for six weeks, in which time they are to be transported as aforesaid: provided that no person whatsoever, belonging to the fort of Ardkyn, and found guilty of mur-

der, be included or comprised in these Articles, or have any benefit thereby.”*

The parliamentary forces, on taking possession of the fortifications, found seven large pieces of cannon, with a considerable quantity of arms and ammunition: they seized also a French Shallop of 28 oars, and several large boats. The garrison was soon after newly repaired, and strongly reinforced. The late proprietor of the islands, Sir Robert Lynch, was declared a forfeiting traitor, and his right made over to Erasmus Smith Esq. one of the most considerable of the London adventures. This gentleman's interest having been purchased by Richard Butler,† created Earl of Aran in 1662, the title of the latter was confirmed by the act of Settlement, as appears by the following document. On 9th September, 21st Charles II, the King, by patent under the act of Settlement, granted unto Richard Earl of Aran the great island, containing as followeth—viz. the 6 quarters of Killeny 153 acres profitable, 211^a 2^r unprofitable. Oghill 6 quarters, 227 acres profitable, 620 acres unprofitable. Killmoacre alias Kilmurry 6 quarters, 308 acres profitable, 504^a 2^r unprofitable. Ogheught 6 quarters, 214 acres profitable, 512 acres unprofitable. The island of Inishmaine containing the 4 quarters of Kilcannon 258^a 2^r 20^p. Lorke 4 quarters 177^a 2^r profitable, 257^a 3^r unprofitable. In the small island 4 quarters 123 acres profitable. Total 2376^a 1^r 7^p statute measure, all situate in the half barony of Aran and county of Galway, at the annual rent of £14. 7s. 0½*d.* payable to the King, his heirs and successors.

On the surrender of Galway to King William's forces, in 1691,

* History of Galway, p. 319, &c. † Lodge's Peerage, V. iv. p. 55.

Aran was garrisoned, and a barrack built, in which soldiers had been quartered for many years after.

In 1762, Arthur Gore was created Earl of Aran. At this time the ownership of the islands is in the Digby family, to a member of which they are said to have been mortgaged by a Mr. Fitzpatrick of Galway for £4000. On failure of payment, the mortgage was foreclosed. The present proprietor is John William Digby of Landestown in the county of Kildare Esq. a Gentleman of popular character, and much esteemed by his tenantry of Aran.

SECTION FOURTH.

PAGAN MONUMENTS—DRUIDISM.

This subject is extensive. What applies to the learning, religion, and national institutions of the pagan Irish, applies also to the ancient condition of Europe. On this important portion of Celtic history, the best means of information, now extant, is to be found in the ancient MS. records of Ireland; indeed little or no such information can be found elsewhere; scarcely a vestige of Celtic learning, in the way of original written documents, can, at this time, be traced throughout the other nations of the west. The Romans, whose polytheism could tolerate foreign creeds the most absurd, actively persecuted Druidism, the religion of the Celts, and the fountain of all their knowledge. Of this fact we have sufficient evidence in the religious warfare, so unrelentingly prosecuted by Paulinus Suetorius and Agricola; and what the Romans left undone in Britain, Gaul, and elsewhere, their Gothic conquerors took care to accomplish, in their desolating rage against every monument

of literature. Ireland never experienced Roman subjugation; and the northern barbarians assailed her not, until the period of her highest advancement in Christianity. Thus her pagan records escaped, in a great measure, the military ravages, which had proved so ruinous to the other nations of Europe. They did not, however, entirely escape the warm zeal of our first Christian missionaries and converts; neither could they have altogether resisted the consuming inroads of a long series of centuries, more especially as they had been singularly and unfortunately denied the powerful restoratives of the printer's art and critic's labour. Yet, among all the western nations, Ireland is without parallel in the preservation of authentic records of remote antiquity. This preeminence may be ascribed to her sequestered situation; her long exemption from foreign subjugation; and, above all, her incomparable institutions and legal provisions in favour of literature and its professors. "Perhaps Ireland," says Dr. Warner, "is the only country, which ever made history and the learned professions a national cause of the utmost importance to the state."*

It is therefore not surprising, that learned men, while treating on British and Celtic antiquities, without any knowledge of those of Ireland, have dealt in vague and groundless conjectures, instead of instructive facts of history—in strained and unedifying deductions from a few Greek and Roman fragments, instead of primitive and substantial domestic documents. "Without the knowledge of the Irish language and books," says Toland, "the Gallic antiquities, not meaning the Francic, can never be set in any tolerable light, with regard either to words or to things."† The philosophic Leibnitz

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* *Introductio ad Hist. of Ireland*, p. 50.† *Hist. of the Druids*, oct. Edinburgh, 1815, p. 70.

goes farther :—“ As the languages,” he says, “ of the old Saxons and Gauls are elucidated by those of England and Wales, *so are the antiquities of the still more ancient Celts, Germans, and, in short, of all the tribes, at this side of the Britannic ocean, illustrated by the language of Ireland.*”* To the British antiquary our ancient learning would be of special value; because it embraces the profoundest antiquities of the British Isles, and because some of the primitive Irish colonies inhabited a great part of Britain, where they left much of their language, religion, and laws. So our annals relate; and so the elder Leland, Lhuyd, Rowlands, Evans, Roberts, and all the best Welsh antiquaries positively affirm. In our old annals, Britain, besides other primitive appellations, is called *Laogair*, and the inhabitants *Laogaire*; who, say the annalists, passed from the larger Isle into Ireland, where they permanently settled. Mr. Roberts, without any knowledge of our history, confirms this account, in his translation of the *Welsh Records*. “ There can be no doubt,” he says, “ but that the language of the Lloegrians was the Gaelic, or Irish. It is to this colony we are to attribute the Irish names of mountains and rivers in Britain.”† That the old Britons lost every vestige of their civil and theological literature, is the complaint of all their historians from Gildas to Milton. Their priests, called *Drudion* (Druids) taught their doctrines by memory, as did the Druids of Gaul. Of these *Drudion* Mr. Jones, an able British antiquary, thus speaks :—“ All the arts, sciences, learning, philosophy, and divinity, that was taught in the land, was taught by them; and they taught by memory, and never would allow their knowledge and learning to be put in writing. Whereby, when they were suppress by the Emperor of Rome

* Coll. Etymol. v. 1. p. 153.

† Sketch of the History of the Cymri, p. 52.

in the beginning of Christianity, their language, arts, laws, and government, were lost and extinguished here in this land.”* In Ireland the case appears to have been otherwise. Our *Draoi*, or Druids, at least in latter times, taught by writing; but in secret characters, and in a style of mysticism and allegory. Some fragments of their theology and ritual are still to be found in our ancient MSS. the originals of many of which were drawn up at different periods of paganism. For instance, in the Book of Lecan, now in the possession of the Royal Irish Academy, the Pythagorean doctrine of the metempsychosis, which was the doctrine of all the Celts, is clearly given in an allégorical fragment.

Doctor Parsons, urging the great antiquity of our records, observes, that “several of them were *written* long before revealed religion was received in Europe, and others composed and handed down, by the fileas and bards, many centuries before the birth of Christ.”† The Doctor, if referring to *existing* documents, must mean copies, not autographs, of the pagan records to which he alludes. “The Druids of the continent,” he says, “never committed their mysteries to writing, but taught their pupils *memoriter*; whereas those of Ireland and Scotland wrote them, but in characters different from the common mode of writing.”‡ Indeed, there are many reasons for concluding, that this universal religion was practised on a far more liberal system in Ireland than in other countries.

The Isles of Aran abound with the remains of Druidism—open temples, altars, stone pillars, sacred mounts of fire worship, miraculous fountains, and evident vestiges of oak groves. “They

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* MS. in the Cotton Library, Vitel. E. v. 6.

† Remains of Japhet, p. 162.

‡ Ibid, p. 144.

were," says Mr. Hardiman, "anciently overshadowed with wood, of which there are still very evident remains. This circumstance, combined with their retired situation and wild appearance, rendered them peculiarly well adapted for the celebration of the pagan rites of the early Irish. The immense cairns, stone monuments or altars, circles, and other Druidic remains, yet to be seen here, show that these Islands were formerly the resort of that famous order of heathen priests."*

These interesting monuments can receive little or no philosophic attention from a tourist, happening to be unacquainted with the Druidic doctrines and ceremonials: a species of knowledge, of the want of which many of the most learned have candidly complained. To be obtained practically, recourse must be had to the physical remains of the ancient and celebrated worship of the Celts. The Aranites, in their simplicity, consider these remains of Druidism still sacred and inviolable; being, they imagine, the enchanted haunts and property of aerial beings, whose power of doing mischief they greatly dread and studiously propitiate. For entertaining this kind of religious respect, they have another powerful motive: they believe that the cairns, or circular mounts, are the sepulchres, as some of them really are, of native chiefs and warriors of antiquity, of whose military fame and wondrous achievements they have abundance of legendary stories. The well attended winter-evening tales of the *Scealuidhe*, or story-tellers, are the only *historical* entertainments of this primitive, simple, and sequestered people. In this credulous and superstitious propensity, they exactly resemble their brethren, the Scots of the Highlands and Isles. Indeed, the solitude and romantic wildness of their "seagirt" abode, and the ve-

* Hist. of Galway, p. 319.

nerable memorials of Christian piety and Celtic worship, so numerous scattered over the surface of the Aran Isles, fairly account for the enthusiasm, credulity, and second-sight of these islanders. The scene reminds one of Major Rennell's observations on Cashmere and its people:—"The pardonable superstition of the sequestered inhabitants has multiplied the places of worship of Mahado, of Besahan, and of Brama. All Cashmere is holy land, and miraculous fountains abound."*

These Isles must be viewed by the antiquary with profound attention. Here he meets, in multiplied variety, the *Cairn*, or sacred mount, on which the fire of *Bel*, or *Beal*, "the Lord," was eternally kept up. The sun was called *Bel*, being considered the *Shechinah* of the divine presence, the type of the Divinity, and the noblest object of the material creation: it was the *Mihir* of the Persian magi. Here he meets the immense flat stone, the *Crom-leach*, or altar of consecration and sacrifices, supported on erect stones; the circle, or circles, of stone pillars, which generally surround these altars, and which formed the outwork of the pyreum or fire-temple; the lofty obelisks, some with, and some without, inscriptions; and the lesser obelisks and tumuli, marking the habitations of "the mighty dead." In these evidences of a worship, so celebrated and universal as the Druidic, there is nothing gorgeous, nothing splendid in the way of art: if measured by modern conceptions, they must appear mean and derogatory. We shall see, however, that such edifices, though rude and simple in the extreme, had been erected for divine worship by God's own people, and by his express commandment. We shall see, that in this instance, and in many more, the patriarchal example had been followed by the ma-

* Memoirs of a Map of Hindostan.

jority of the nations of the east ; where the Magian priests, abhorring idolatry, erecting altars in high places, and, under the symbol of fire, worshipping one supreme God, self-existing and eternal, had been opposed to Labinanism, polytheism, and image-worship. This was the reformed religion of Zerdust, or Zoroaster,* the great Persian prophet, and cotemporary of Darius Hystaspes ; and it is still preserved by his disciples, the Parsees or Guebres, who “ generally,” says Richardson, “ build their temples over subterraneous fires.” † “ At the city of Yezd in Persia, which is distinguished by the appellation of *Darub Abadat*, or seat of religion, the Guebres are permitted to have an *Atush Kidi*, or Fire temple, (which, they assert, had the sacred fire in it since the days of Zoroaster) in their own compartment of the city.” ‡ The Greeks and Romans had their inconsumable fire, as had all the Celtic tribes through their widely spread nations. The ceremony was of divine original, as I shall presently make manifest. To this day in Ireland, beyond any European nation, is this most ancient and universal rite regularly observed. The symbolic fire still gives name to the first of May, called in Irish *La Bail-teine*, “ the day of Bel’s fire,” which periodically blazes throughout the island, particularly at midsummer ; and for its imagined purifications the peasantry still entertain enthusiastic respect, although quite unconscious of the source of their immemorial superstition. The word, year, is in Irish “ *bel-ain*,” the circle of the sun, from *bel* sun, and *ain* a ring or circle.

As these monuments of heathenism, in the Isles of Aran ; present no peculiarity distinguishing them from similar objects, so numerous throughout the British Isles, and so familiar to all, I will strive to substitute, for a minute detail of them, a brief analytical expo-

* In Persic, this word means “ an observer of the heavens.”

† Asiatic Researches.

‡ Pottinger’s Beloochistan.

sition of the far famed religion they commemorate, and of the offices and character of its ministers. All are aware, that the priests of Druidism were the great depositories of every branch of civil and ecclesiastical learning, such as had been cultivated in their times. Their history is intimately interwoven with the universal history of ancient Europe ; and, as such, it founds the grand basis of national history, in its most comprehensive view. It is not the detail of these human butcheries, called “ the conquests of empires ;” it is the pleasing and instructive narrative of the noblest progress of the human mind—of the arts, institutions, and useful discoveries of mankind. The prejudices of modern education may be opposed to this inquiry ; but for many it will have attractions, as powerful, at least, as the unedifying and absurd mythology of Greece and Rome.

There is another motive for introducing this interesting inquiry. Some have thought proper to deny the validity of the pagan history of Ireland, on the assumption, that the Irish were unacquainted with the use of letters, down to the period of their conversion to Christianity. A knowledge of the constitution of our pagan priesthood is, in itself, abundantly adequate to remove the strange deception, which some of our learned Druids of the present day, the Rev. Mr. Innes and Dr. Ledwich for instance, have happened to entertain, even to a degree of dogmatism. One doubt produces many : the Doctor has denied not only the learning of his Druidic predecessors, but he also denied the existence of St. Patrick ! I am not disposed to impute wilful infidelity : indeed I feel bound to ascribe this sceptic spirit to a total ignorance of the early and genuine annals of the country, and of the language in which they are conveyed. This prime defect, in the qualifications of a national historian, has been universally acknowledged by the unbelievers

themselves. It is not difficult, however, to disprove their negatives : positive arguments they do not, and cannot advance. Aran may be considered the Mona of Ireland, and distinguished seat of Druidism. If my description of that primitive worship be rather detailed, I hope it will not, at least, be considered irrelevant. If I succeed in vindicating our venerable memorials of antiquity, the candid and learned reader will not, I think, much care, whether I take occasion to do so, by setting out with our local, rather than with our general history. No portion of the Irish population has preserved the primitive manners, language, and recollections, with more fidelity than the secluded inhabitants of Aran.

Pliny derives the word, *Druid*, from $\Delta\rho\upsilon\varsigma$, oak, I suppose, because in the Druidic tenets the oak and misleto were held sacred. Several have injudiciously adopted this notion, unmindful of the absurdity of attempting to trace Celtic words to Greek derivations. Strabo ridicules the practice ; and Plato, in his *Cratylus*, is expressly of opinion, that the Greeks had borrowed many words from the barbarians.* Hence he concludes, that “ whoever endeavours to adjust the etymologies of those words with the Greek language, and not rather seek for them in that to which they originally belong, must necessarily be disappointed.”† Quintilian informs us, that, before the time of the consuls, the Latin was rude and barbarous in expression, having many words from other languages, especially Gallic (Celtic) words. In fact, the *Lingua Prisca* of Italy was the language of the Umbrians and Sabines, who were Celts. Italy was called *Gallia Cisalpina*, as being colonized from Gaul.‡ There is such a thing as philological bigotry. *Omnia Græce* is no

* Paris Edit. fol. 1. p. 409.

† Ibid.

‡ Polyb. l. 2. Leibnitz. collect. Etymol. vol. 1.

unfit motto for certain scholars of the present day, who would persuade us, that all Irish, or Puno-celtic words, holding affinity in sence and sound with the Greek, must necessarily be of Greek origin! The very schoolboy ought to know, that the early Gauls and Greeks were colonially commixed; that, six centuries before Christianity, the Phocians had settled at Marseilles, as had several of the conquering tribes of Gaul settled in Italy, Greece, and Asia Minor; and that this commixture had produced, to a certain degree, an interchange of language, laws, and religion: besides, the Gauls, as well as the Greeks, had their Phœnician masters.

Were Pliny's interpretation at all allowable, the word ought to be traced to the Celtic *Dair*, oak; but it cannot be so traced. Even analogy is against the Greek derivative. In the English language, the Greek *ν* is invariably changed into *y*, as in tyranny, physiology, hydrophobia, &c. so that, according to this unexceptionable rule, we should read, were Pliny right, *DRYADS*, *silvan nymphs*, for *DRUIDS*, *Celtic priests*! Vossius condemns Pliny's notion, and thinks *Druis* the same as the German *Tronwis*, "a teacher of truth and faith."* Goropius, with more accuracy, says *Tronwis* simply means "a wise man." In the Irish annals, *Magh*, a Magian priest, is sometimes put for *Draoi*, a Druid. The words are synonymous, the *Draoi* and the *Magi* of Persia being the same. Our *Draoi* is the Persian *Daroo*, sapiens, from the Hebrew *daras*, consulire. "In the ceremonies of the Guebres," says Richardson, round their fire, as described by Lord, "the *Daroo* giveth them water to drink, and a pomegranate leaf to chew in the mouth, to cleanse them from inward uncleanness."† Among the

* Eymologicon Linguæ Latinæ, &c. at Druidæ.

† Asiatic Researches. p. 214.

Persians, the name *Daire*, or Darius, had the meaning and Hebrew root of *Daroo*. No name was more common than *Daire*, among the native Irish princes. In the Irish version of the Bible, the magi, or wise men of the east, are called *Draoithe*, Druids. Of what are denominated the Celtic dialects, the Irish, the Earse, the Welsh, the Manks, the Cornish, the Armoric, and the Cantabrian, none comes nearer to the Persic than the Irish. Between both there is an actual identity; and that too in words peculiar to the wants of early Society. Language is a sure clue to the parentage of nations; and, where annals and language agree, historical certainty is complete. “In explaining words of common use, we are allowed,” says Vossius, “to look to their agreement with ancient words; and, in this operation, *to pass from the colony to the parent nation.*”* The Irish annals are diffuse in recording, that Ireland had received an early colony from that part of *Iran*, or *Persia*, which borders on the Caspian. This tribe were Scythians, though generally called Caduceans or Caspians. They mixed with the Canaanites or Phœnicians; shared in their maritime enterprises; and with them settled successively in Lybia, Sicily, Spain, and the Britannic Isles, the Casseterides of the Phœnician merchants. So say our annalists, who are in exact accord with Trogus and Justin, in their accounts of the brilliant triumphs of the Scythians in upper Asia, as far as Syria, and to the confines of Egypt, which latter they put under contribution. The Scythic name is still preserved in that of the *Scuits*, or *Scots* of Ireland and North Britain. Boxhorn properly observes, that the Persians were descended from the Scythians.

I have been led from words to things—from language to the

* Etymologicon, &c.

original of a nation. No two subjects can be more closely interwoven.

I consider the Druidic religion to have been truly patriarchal, antecedently to its pollution by the Sabian heresies, divination, human sacrifices, and popular superstitions. The Magian, or fire-worship doctrine, opposed to Sabianism, or image-worship, was restored to its primitive purity by Zoroaster, and by his disciples transmitted to the west. The western fire-worshippers, like their prototypes, the Gaurs or Guebres of the east, believed in one supreme, omnipotent, eternal, and self-existing being; in the immortality of the soul; and in future rewards and punishments. Though called fire-worshippers, they were not really so. They revered fire: they did not worship it. In their views, it was impious to represent the divine essence by images or statues, or to circumscribe the Lord of the Universe within the limits of a temple; and hence their worship in the open air. In the east, a reformation was, indeed, introduced, which ordered covered temples, to save the sacred fire from being destroyed by rain and tempests. I am persuaded, that a similar precaution was used in Ireland; and that our Round Towers, if not themselves covered fire temples, were, at least, constructed, more or less, on the model of our minarets of paganism. One of them is, to this day, called *Teampal na Greine*, "the temple of the sun." They must be very ancient; they are mentioned frequently in our earliest annals; and Cambrensis, in the twelfth century, relates, that, on a clear day, in smooth water, the fisherman could observe one of them, which stood deep in lake Neagh.* Tower is, in Irish, as in Syriac, *tur*, the root of the Greek and Latin terms for these edifices. Ptolemy

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* Topogr. Hib.

mentions them, in his account of Ireland. It is certain, that they were occasionally used for astronomical purposes ; and, in Christian times, as belfries and penitentiaries.

The eastern and western fire-worshippers considered the sun the parent and purest fire, the emblem of the Divinity, the minister of his blessings, and, next to the soul of man, the most stupendous production of divine power ; and hence their eternal fires, and their turning in prayer to the east, the quarter in which the glorious luminary first appears. In the erection of Christian churches, the latter practice seems not to be entirely forgotten. The reverence of the Druids, or western Magi, was extended, in a subordinate way, to the stars and elements ; but the great architect was the sole object of their adoration. Idolatry and polytheism had their rise in that gross fatuity, which mistook the representative productions of divine omnipotence for the Divinity himself, the ministers for the master, the created for the Creator. Thus, the heavenly host, the elements of nature, and statues and obelisks, instead of being revered as memorials of a higher and purer worship, became primary objects of adoration : an impious apostacy, from which even the Hebrew people were not entirely exempt.

Let us now examine the similitude, or rather the identity, of the Jewish and Druidic religions.

In both, sacrifice was always considered the most solemn and sacred act of worship, the performance of which was reserved solely for the priestly order. It is as old as the creation. The oblations of Cain and Abel are recorded, and the observance seems to have been hereditarily preserved and handed down by Noah ; who, immediately on coming out of the Ark, erected an altar, and offered sacrifice to the Lord. (Genesis, viii. 20.)

Among the Druids, the altar of sacrifice, on which the holy fire

was kept unextinguished, was erected on an artificial heap of stones ; and stood, generally, within a circle of twelve erect stone pillars, and sometimes within a double circle. On these sacred mounts, we also often meet rude obelisks, verging from about ten to twenty feet in height, and of proportionate dimensions ; in some places standing alone, in others surrounded by small pillars. These mounts, altars, and pillars, were always surrounded with oak groves. They are all mentioned in the inspired writings. *And Jacob said unto his brethren, gather stones, who brought stones and made a heap, and they eat upon this heap.* (Genesis, xxxi. 46.) This was in confirmation of the pact between Jacob and Laban. The covenant concludes with the last and most solemn act of religion. *And Jacob did offer sacrifice upon the mount, and called his brethren to eat bread.* (Gen. xxxi. 54.) We further read, that Abraham passed *into the oak grove of Moreh*, where he *built an altar unto the Lord.* (Gen. xii. 6.) *Abimeleck was made King by the oak of the pillar.* (Judges, ix. 6.) *Joshua took a great stone, and set it up there, (that is in Shechem,) under the oak, which was to be taken for the sanctuary of the Lord.* (Joshua, xxiv. 26.) The inspired writer mentions the sepulchral stone pillars of Jacob in Bethel, (Gen. xxviii. 18.) and of Rachel and Absalom. (Gen. xxxv. 19.) God himself commands Joshua to *take up twelve stones, a stone for every tribe, and to pitch them as a memorial of their passage over the Jordan.* (Joshua, iv. 20.) The ancient law was, *not to strike a tool upon the sacred things*, thus described by Moses—monuments of whole stones, over which *no man had lifted up any iron.* (Josh. viii. 31.) And in Exodus, *If thou wilt make me an altar of stone, thou shalt not build it up of hewn stone ; for if thou lift thy tool upon it, thou hast polluted it.*

In all these passages, we meet an exact resemblance, even to minuteness, between the Jewish and Druidic places and edifices of worship. The sacred mounts and altars of sacrifice—the great stone under the oak as the sanctuary of the Lord—the twelve pitched stones—whole stones not touched with iron—all these were just as peculiar to the one worship as to the other. I am reminded of another striking resemblance. Some of the Druidic pillars have a small cavity at the top, whence runs a groove, about an inch deep, which reaches to the ground. May not the cavity and the groove have been appropriated to some such ceremony as Jacob performed, when he poured wine and oil on the stone pillar at Bethel? (Gen. xxv. 14.) Struck with these extraordinary likenesses, Doctor Dickenson exclaims—*En primos sacerdotes quernos! En patriarchas Druidas!*

With respect to the veneration for fire, so characteristic in the Druidic doctrine, that too appears to be of divine original. A perpetual flame ascended on the altar of burnt offerings at Jerusalem. The Almighty revealed himself to Moses in a burning bush, and announced his presence to the host of Israel in a pillar of fire. This universal and immemorial fire-ceremony does not appear to have been entirely neglected by the early Christians: it was, for instance, long and reverentially observed by the pious sisterhood of St. Bridget of Kildare.

There are other strong analyses, at which I must beg leave to glance. The Druidic altar stone, called in Irish, Cambric, and Armoric, *crom-leach*, *leac*, or *lech*, that is, “a bending stone,” so designated from bowing before it, seems to be the bending stone of the Hebrews, called (in Levit. xxvi. 1.) *even mas-cheith*, commonly translated *lapis insignis*, but, by the Chaldee paraphrast, *lapis incurvationis*. However palpable the likeness, I must not

venture to say, that our *crom-leach* is a corruption of the Hebrew *chemar-luach*, “a burning or sacrificing stone or table,”—or of *crem-luach*, “a consecrated stone or altar.” (Levit. xxvii. 28. Numbers, xviii. 14. Josh. vi. 18.) The Druidic *crom-leach*, like the Hebrew altar stone, was ponderous, rude, and unhewn. There are very large ones in the Isles of Aran. In the west of the county of Limerick, not far from Rathkeale, I have seen an immense one, placed horizontally, and supported, I imagine, by erect stones, sunk so deep in the earth as to escape observation. This huge stone could not, I think, weigh under thirty tons; and it must have been conveyed from a distance of several miles, nothing like it, in quality, being discoverable in the neighbouring quarries or mountains. If our Celtic ancestors had been quite so ignorant as they are represented, it is strange that their acquaintance with mechanics enabled them to move, from place to place, masses so immense as to astonish the modern observer. There is in Nivern parish, Pembroke-shire, a *crom-leach*, which is eighteen feet high and nine broad towards the base; near it is a piece broken off, which seems to be of such weight as twenty oxen could not draw. Another is to be seen in Poitiers, of the amazing circumference of sixty feet, erected on smaller stones; but the French could not account for this venerable monument.* The Gaulish antiquities are long since lost. In Jersey and the neighbouring islands, these altar stones are numerous. The oldest Irish for a priest is *cruimthean*, from thence *crom-leach*, and for priesthood *cruimthead*: *sagart* is evidently from *sacerdos*.

The artificial and sacred mount, on which the altar was erected,

* La pierre levée de Poitiers a soixante pieds de tour, et elle est posée sur cinq autres pierres, sans qu'on sache non plus ni pourquoi, ni comment. Chevereau, *Memoires D'Angleterre*, p. 330.

is called *carn*, and *carn-nedh*, either from its circular form, or from going round it in the act of prayer, *circa* meaning to go round, or to form a circle. These mounts, like the *Hermaia* or Mercurial mounts of the Greeks, were generally erected on eminences. They are of various sizes, and composed of loose stones, at present covered with earth and sod. At top is the large burning stone, or altar of sacrifice. They are easily distinguished from the sepulchral barrows of the Gothic nations, which were generally made of earth. They differ also from the small heaps, which the Irish call *leach-da*, and which they raised in memory of the dead, by throwing on the heap the first stone that came in the way. In the sacred *carns* were frequently deposited the remains of persons of rank, with the favourite hunting dog, breast plates, military trappings, &c. Such ornaments, together with human bones and urns, being often dug up from beneath the altar stone, or not far from the *gullan*, or lofty and lone obelisk. The latter was erected for religious purposes, like "the great stone under the oak," mentioned in the sacred writings; or as a testimony of some memorable event and federal regulation, as in the case of Jacob and Laban; or, most generally, in memory of the dead, as in the case of Rachel, (Gen. xxxv. 20.) of Abraham, (2 Samuel, xviii. 18.) and of King David, alluded to in Acts ii. 29. and mentioned by St. Hierom in his epistle to Marcella. It appears, from the book of Joshua, that the custom was common among the Israelites. Among the Gentiles, when the patriarchal theology was lost, these rude columns were supposed to be animated by the spirits of the distinguished persons, whose memory they were intended to preserve;* and hence the idolatrous homage they universally received. With these pillars, a

* Clemens Alexan. fol. ii. p. 6.

noble bard of our day correctly associates the memory of the illustrious of ancient Greece :—

“ The silent pillar, lone and grey,
“ Claimed kindred with their sacred clay.”

In Ireland, the chief of these idol pillars was called *crom-cruach*, or *crum-dubh*. It stood, in the midst of twelve smaller pillars, on a hill in Breffny, a district now united with the county of Cavan, but formerly with Leitrim. This place of worship was called *Magh-sleuct*, “ the field of adoration,”† and the circular stones are still partly to be traced. The annals of the Four Masters of Donegal call it, I believe with more propriety, “ the field of slaughter;” because there, according to all our annals, the monarch *Tigermas*, and a large portion of his subjects, were slain, while paying adoration to the Idol. I mention this circumstance, because it goes to show, together with many other evidences in our old records, that image-worship was an innovation, abhorrent to the early pagan Irish; and that the religion they imported was the pure Magian worship of Persia. We have still preserved the formula of their oaths, upon entering on any solemn public covenant: they swore by the sun, moon, and stars, or by the wind and sun, the gods of the Phœnicians. Were I not apprehensive of swelling this subject beyond my present limits, I would transcribe from the ancient annals, and in the vernacular tongue, this *rath* or oath; and prove, without any other aid than that of language, the intimate connection, in many respects, between the civil and religious practices of the Jews, Phœnicians, and pagan Irish.

The *carn-nedh* is common in Wales. In the parish of Ardfert

and county of Kerry, I have seen one, which still preserves the name. It is a regularly sloping mount, of considerable dimension at the base. On the summit is a *Gullan*, or obelisk, about twenty feet high. A "cooped heap" is expressed in Hebrew by the compound *Kiren-nedh*. Can one possibly imagine stricter similitudes, in names, things, and ceremonies? Almost all nations, I am aware, have manifested indications, more or less, of the Jewish customs. I am certain, that the ancient religion, laws, customs, and language of Ireland come closer to the history of the Hebrews, than those of any other European nation. Irish history records an eastern intercourse between our early colonists and that people; and the record is fortified by ancient foreign history. It is not now denied, that the Phœnicians, and other neighbouring tribes, had penetrated, as early as the time of Moses, to the western extremities of Europe, to Spain, and to the Britannic Isles, called "the 'Tin Isles." We also know, that this ancient maritime people, named in Scripture Canaanites or merchants, mixed with the apostate Jews of Syria and Palestine; and that the conquests of Joshua forced the latter and others to seek, by the favour of the Phœnician traders, new settlements in Africa and the western parts of Europe. The very name of Canaanite is still preserved in the Irish *Ceannaidhe*, pronounced *Canee*, a merchant. What else than Phœnician could be understood by the *Feine*, and the *Fenius Fear-siodh*, or "man of wisdom," so much insisted upon in our remotest annals? The likeness, in sound, meaning, and construction, between the Irish language and the Punic speech of Hanno, in the *Penulus* of Plantus, has, I think, been sufficiently established. In the course of reading, I have met the most striking analogies between the ancient Irish and the Hebrew people; so much, that I have been tempted carefully to collect them, with a view to their publication in a work, I am putting

in readiness for the press. The reader may not be displeased with one or two illustrations, which, if not conclusive in argument, are, at least, matter of some curiosity. The first is taken from language, a powerful light for tracing the ancient connections of nations. The Irish characters, like the Cadmean, are sixteen, rejecting the doubtful P. Their shape is now modelled nearly after the present Greek and Roman manner; but, like their number, their names, order, and power, are peculiar. B, L, N, are first in order, and the vowels last. The Irish also, like the Chinese, had several characters representing entire words; and I am not without reason for believing, that at one time they wrote from right to left. By comparing the names of a few of the Irish characters with those of the corresponding Hebrew letters, we cannot be at a loss for the origin of the former. In words, the analogies are numerous.

<i>Irish.</i>	<i>Hebrew.</i>
B Beth	Beth.
M Muin	Mem.
N Nion	Nun.
P Peth	Pe.
R Ruis	Resh.
A Ailm	Aleph.
I Idho	Yod.

While making the collection, of which I have just spoken, I met the article, copied literally in the margin,* in Nicholas Lhuid's

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* Posellus v. dum Pomponium Melam Lutetiæ perlegerit, ab Hebræis repetit, ut sit *Irin* quas; *Iurin*, i. e. *Hebræorum terra*. Hebræi, inquit, cum Magi essent peritissimi, scienterque imperium universi futurum in angulo fortissimo, qui est ad Caurum, illas partes, et *Hiberniam* quam primum occuparunt; Sirique et Tyrii istas regiones, ut *basim imperii ponerent*, incolere.

Historical and Geographical Dictionary, headed HIBERNIA. If this Rabinic prediction be supposed to embrace the British Isles, generally, it is happily verified in the present powerful sway of the British empire. On the map of the *Globe*, that region appears as a little dot, yet, it is the seat of universal maritime power—the impregnable fortress in the west—*imperium universi in angulo fortissimo qui est ad Caurum*. That Syrians and Tyrians, whom we cannot separate from the Phœnicians, had not only visited, but also colonized, these Isles, as the quotation from Posellus and his Jewish authorities affirms, is a fact established by history, and by the affinities of language, religion, and laws. But, that *Erin* or *Irin* means *Hebræorum terra*,—and that it had, at one time, been colonized by Israelites, are points, which I am incompetent to discuss. Certainly, it is far from improbable, that, at no distant period after the victories of Joshua, some of the vanquished and proscribed Jews had accompanied their Phœnician guides not only to Africa and Spain, but also to Ireland.

“If,” say the authors of the Universal History, “we admit what the generality of Spanish writers affirm, after Berosus, that Tubal, the fifth son of Japhet, came and peopled Spain, so soon as 143 years after the flood, Gomer, the eldest brother, and father of the Celts, must have been as soon in the possession of Gaul; and both must, of course, be supposed to have brought the same religion, laws, government, &c. namely, that which they received from their grandfather Noe; and how tenacious both these and other nations of the same Celtic descent were of their own religion and laws, will be easily seen in the histories of the Gauls and Germans. All that we shall say further of their religion here is, *that it was, in all these countries, the same as that of the old patriarchs*. They rshipped one Supreme Being, not in temples, as the Greeks and

Romans, but in groves consecrated to him; they believed a future state of rewards and punishments, suitable to their behaviour in this; they offered victims to him, and celebrated some festivals in honour of him; and in most things observed a great simplicity in all their religious rites, during a long series of ages.”*

I have been particular in tracing the religion of our pagan ancestors to the patriarchal institutions; because, by a gross misconception, that religion has been considered a tissue of profane and diabolical practices, revolting equally in doctrine and discipline. It must be allowed, that it degenerated from its original simplicity, and that the immense power and craft of its ministers had disfigured it with many superstitious abuses; yet, if we examine the general history of paganism, the system of our ancestors will be found superior in theology, ethics, and ritual. The quick and easy reception of Christianity, in this Island, is an unequivocal proof, not only of the liberal and tolerating spirit of the religion it supplanted, but also of enlightened civilization and charitable forbearance, certainly without parallel in the early records of the Christian world. Our first Christian teachers were all confessors: none were martyrs! The singular fact is attested by Cambrensis, who inconsiderately brings it forward as an opprobrium on our nation. He says, that none of the saints of that country (Ireland) cemented the foundation of the rising church with their blood; and that it was the only country in which all were confessors, not one being able to boast of the crown of martyrdom!†

* Univer. Hist. v. 18. p. 353.

† Omnes sancti terræ istius confessores sunt, et nullus martyr; quod in alio regno Christiano difficile erit invenire, Mirum itaque quod gens crudelissima et sanguinis sitabunda, fides ab antiquo fundata et semper tepedissima, pro Christi ecclesie corona martyrii nulla. Non igitur inventus est in partibus istis, qui ecclesie surgentis fundamenta sanguinis effusione cementaret; non fuit qui faceret hoc bonum, non fuit usque ad unum. *Topograph. Hibern. Dist. 3. c. 29.*

The *carn*, or sacred fire-mounts, are still traced through all the Celtic nations, particularly in the British Isles. There is, in Auvergne, one called by St. Gregory of Tours, in his book *De Gloria Confessorum*, c. 3, *mons Belenatensis*, "the mount of *Beal*," the Apollo of the Greeks and Romans, who from *Carn*, had the name of *Carnus*, and certain feasts, in honour of him, *Carnea*, which were celebrated in May, thence called the *Carnean* month, as were the priests of Apollo called *Carnean* priests. The Greeks learned these terms and ceremonies among the Gauls. The Lothian inscription to *Apollo Grammus*, by the Procurator Quintus Lucius Labinianus, can be explained only by Celtic references: it means, "to Apollo the sun," *Grian* being one of the Celtic appellations of that luminary. At the Druidic sacrifices, it was customary with the Lord of the place, or some person of distinction, to take the entrails of the sacrificed animal in his hands; and, walking bare-footed over the coals, after the flames had ceased, to carry them to the officiating Druid, who waited at the altar. If the nobleman escaped unhurt, it was reckoned auspicious; if injured, it was considered unlucky, both to himself and to the community. To this sort of purifying ordeal the cattle were periodically submitted, as they are to this day in the Isles of Aran and other parts of Ireland. Without a knowledge of those practices, it would be impossible to explain the speech of the Consul Flaminius to Equanus the Sabine, at the battle of Thrasimenus, as related by Silius Italicus,* who mentions the BURNING HEAPS of divine Apollo. The mountain Soracte, now *Monte di San Sylvestro*, about twenty miles to the North of Rome, and situated in the country of the Falisci, was one of those places, where sacrifice was annually offered to Apollo.

* L. 5.

In its neighbourhood, says Pliny, were a few Hirpian families, who, at those festivals, walked barefoot over the burning wood, without injury; by this ceremony they were exempt, through a decree of the Senate, from military service and other duties.* Virgil, in the second book of his *Æneid*, introduces Aruns, one of this Hirpian family, thus praying to Apollo:

*Summe Deum, Sancti custos Soractis, Apollo,
Quem primi colimus, cui pineus ardor ACERVO
Pascitur; &c.*

One, ignorant of the origin of the Umbrians and Sabines, must be surprised how those Hirpian priests come to such exact knowledge of the rites of the priests of Gaul, Britain, and Ireland. So uniform and universal was this famous religion! Varro describes the ointment, with which they saved their feet in this ordeal.

There is another criticism connected with Celtic learning, of which I am here reminded. *Ogmios* was the distinguishing epithet of the Hercules of the Gauls, which as Lucian was informed by a learned Druid, did not mean strength of body, but force of eloquence. It is the Irish word *Ogam*, with a Greek termination; and it signifies the secret of letters, the letters themselves, and the learning that depends on them, whence the force of eloquence proceeds. This interpretation is familiar to every reader of the ancient Irish MSS. and in no other Celtic document, now extant, is the true meaning of the word to be found. The sacred writings of the Druids of Ireland was in the Ogam characters, an ancient parchment book, full of which had been in the possession of Sir James

* Hist. Nat. l. 2. c. 2. Solin. Polyhist. c. 8.

Ware*. This occult writing is described in several Irish MS. treatises, one of which is preserved in the University of Dublin. It is also well described in an elementary tract, called *Urichecht-na-Negais*; which, with other valuable remnants of Celtic learning, is to be found in the Book of Ballymote, now in the possession of the Royal Irish Academy. Duaid M'Firbis, the last of the hereditary annalists of Lecan, had communicated, in 1683, to Mr. O'Flaherty, the author of the *Ogygia*, that he had some of the primitive birch tables, and many sorts of the old occult writing.† Forchern, a heathen writer, and author of the elementary work contained in the Book of Ballymote, ascribes the invention of the Ogam letters, *Bethluis—Nion an Ogham*, to the Phœnicians, or, more strictly, to *Fenius*, whom I take to be Phœnix, the brother of Cadmus. Here, I would beg leave to express an ardent wish—it is, that the valuable repositories of Celtic learning, the Book of Lecan, the Book of Ballymote, and the Speckled Book, in the present possession of the Royal Irish Academy, should be fairly copied and printed, with an English or Latin version, in alternate pages. Parliament has lately voted a grant towards defraying the expences of collating, compiling, and publishing the ancient Chronicles of England; but, in that country, no such primitive and authentic records, as those just enumerated, can possibly be found. If, for this national purpose, a part of the grant were extended to the Academy, most certainly, it could not be better applied. “Notwithstanding,” says Toland, “the long state of barbarity, in which that nation (Ireland) hath lain, and after all the rebellions and

* Præter characteres vulgares, utebantur etiam veteres Hiberni variis occultis scribendi formulis seu artificijs, OGAM dictis, quibus Secreta sua scribebant. His refertum habeo libellum membranaceum antiquum. Antiquit. &c. c. 2.

† *Ogygia*, pars 3, c. 30.

wars with which the kingdom has been harassed, they have incomparably more ancient materials of that kind for their history, to which even their mythology is not unserviceable, than either the English or the French, or any other European nation, with whose manuscripts I have any acquaintance.”*

Ogma, among the Irish, was a most ancient proper name, *Ogma Grianán*, or “sun like,” was one of the oldest of our Damnonian kings, a learned man, whose queen was *Eathnea*, a famous poetess, perhaps Druidess. In Ireland, males and females, of royal lineage, were initiated in the Druidic mysteries, at which they regularly assisted. The annals of Tigernach mention the massacre, by order of Dunlang, king of Leinster, of thirty royal priestesses and their attendants, in their sacred retreat at Clonfert, near Tara, A. D. 230.† We have also a detailed account of the theological controversy between the young princesses, daughters of the Monarch *Laoighre*, and the chief Apostle of Ireland, at the commencement of his mission.

The offices, privileges, and power, of this priesthood were high and extensive. Matters of religion, law, equity, and the distribution of rewards and punishment, were all under the control and final decision of the Druids. Whoever refused to submit to their decree was instantly visited with the terrible penalties of their excommunication. He was interdicted from all participation in religious worship, from all appeal to justice, and from all commerce with society, even with his nearest relatives; he was liable to all sorts of insults, and rendered incapable of holding any place of trust or dignity; he lived and died without honor or pity, or the common rites of sepul-

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* Hist. of the Druids, p. 82.

† Codex Bodleianus, Rawlinson, fol. 6. col 1.

ture. To this dreadful dispensation kings and princes were also subject. "Without the Druids, who understood divination and philosophy, says Dion Chrysostom, the kings may neither do nor consult any thing; so that in reality they are the Druids who reign, while the kings, though they sit on golden thrones, dwell in spacious palaces, and feed on costly dishes, are only their ministers, and the executioners of their sentence."* They were the sole arbiters in the question of peace or war; and, at the same time, had the address to exempt themselves from bearing arms, paying taxes, or contributing to the support of the state. These powers and privileges induced many of the first rank to join the Druidic Sodalities, though obliged to devote twenty years to complete the study of their doctrines and mysteries. In every affair of importance, these priests were consulted by the sovereign magistrates; and all the great families of the kingdom thought it a happiness to have a member from each in this most influential order, for the purpose of protecting the rest. The education of the king's children was exclusively committed to their charge; and, in general, their persons were considered inviolate, even by an adverse party.

In this religion, there were four degrees of priesthood, the Arch-Druid exercising supreme jurisdiction over all; there were also communities of priestesses, as well as of priests. The Druids were the depositories of all sorts of learning, before learning had been divided; theology, moral and natural philosophy, particularly astronomy, law, history, &c. were taught in the Druidic colleges. As divines, philosophers, lawyers, and chief arbiters, they were feared and respected by all, from the prince to the peasant.

The Druids of Gaul celebrated their great annual festival at

* De Recusatione magistr. in Senatu, p. 538. Edit. Paris.

Chartres, that being the centre of the kingdom. Besides their sacred and perpetual fires and minarets, they had also their sacred gems, herbs, eggs, stones, and their venerated All-heal, or miselto, “gathered,” says Pliny, “by a priest robed in white, and in his hand a gold pruning knife.”* Cæsar† gives a frightful account of their human sacrifices, and so have others; but, these abominations, augury, and various superstitions, mark only the latter part of the Druidic history. It was pure in its origin, and so continued for many ages.

The last quoted writer had been informed, that the Gauls resorted to the Britons, as their teachers in the doctrine of Druidism. That might have been so, in Cæsar’s time; but none will deny that the Gomerian tribes, in their early emigrations to the European continent, had brought with them their language, religion, and laws. When Cæsar wrote, that is, about a half-century before Christianity, Britain, or rather Mona, might have been a great mart of Druidic learning; in that respect, however, it has not been so celebrated as Ireland, the *Ierne* of Aristotle, the *Sacra Insula* of Avienus. So distinguished had the latter country been immemorably for its mithratic worship, its holy fires and altars, that it had been considered a consecrated island many centuries before Christianity. It was the country of the celebrated *Abaris*, the Druid, the priest of Apollo,‡ and the associate of Pythagoras;§ and there is no reason whatever to doubt, that it is the Hyperborean island of Hecateus and Diodorus, || “situated opposite the Celtæ, fruitful, pleasant, and dedicated to Apollo.” Our pagan annals, the sacred characters and Druidic fragments they contain, the numerous mo-

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* Hist. Nat. l. 16, c. 44.

† Comment. l. 6.

‡ Porphyrius in Vita Pythag. Jamblichus, l. 1, c. 28.

§ Ibid.

|| L. 2. p. 130.

numents of fire worship every where meeting the eye, the immemorial traditions and very language of the people, their annual observances and still existing veneration for fire—all these actual testimonies, preserved after a lapse of near 2000 years, sufficiently manifest, that Ireland had not been less distinguished for Druidic, than for Christian learning. We still have, in common Irish conversation, *Sen-draoi*, an old Druid—*draodheas*, druidism or magic—*Slatan-draodheacht*, the wand of Druidism—*Glúine na druidhe*, the Druid's glass—*Uillichach*, the miselto, &c. The names of places, anciently occupied by the Druids and Druidesses of Ireland, are beyond counting. There is scarce a Druidic monument, in the isles of Aran, for which the natives do not name an occupying priest or priestess, of whose magic power and history they have numerous traditions. The Irish annals furnish the names of some of the most celebrated of those persons, who flourished at different periods, throughout the kingdom; and the same authorities inform us, that controversial writings, opposed, even in pagan times, to the superstitious degeneracy of Druidism, were by no means uncommon. *Conla*, a pagan judge, and *Cormac*, a pagan monarch, had been distinguished by such writings; which, however, are unfortunately lost. Of *Conla*, one of our old annalists says—*Se do rinní an choinbhliocht ris na Druidhibh*, “it is he that disputed against the Druids.”

All the sacred mounts were so disposed as to form a chain of connection with each other. On the eve of the first day of every *ratha*, or quarter of the year, particularly of the first of May and first of November, these mounts brilliantly exhibited, throughout the kingdom, the great fires of *Bel*; sacrifices and feasting accompanied the solemnity; prayers were offered for the fruits of the earth; the holy flame was considered essential to the preservation of cattle

from contagious sickness, and even to that of men. All were obliged to extinguish the fires in their houses, on these eves, and rekindle them with the consecrated fire, which the Druid gave with his benediction, and for which he was paid. These fires are thus mentioned by *Cormac*, prince and Archbishop of Cashel :

Dha teinne Soimech do guitis na Draoithe con tincealaib moraib foraib, agus do berdis na ceatra or teamandaib cacha bliadhna. “The Druids kindled two immense fires, with great incantation, and towards them drove the cattle, which they forced to pass between them every year.”—It must be observed that there were always two fires close to each other; to pass between them uninjured was considered auspicious for man and beast; to receive injury was considered the reverse; and hence the saying of being placed “between the two fires of Bel,” *ittir dha theinne Bheil*.

The *Ard-Draoi*, or Arch-Druid, has his great periodical festival on the hill, called *Carn-Usnach*, in the county of Meath, this place, like Chartres in France, being the centre of the kingdom, at which the five provinces came in contact; near it was *Flach'd-gha*, another fire mount in the immediate jurisdiction of the Arch-Druid; on both stood immense fire-temples. The principal fire-mounts in each province were also set apart, occasionally, for judicial proceedings, national convocations, and the inauguration of the monarchs and provincial princes. The economy of our pagan ancestors was to give a degree of religious solemnity to great civil and judicial meetings. Tara, in Meath, the residence and place of the Monarch's inauguration, and the seat of the *Feis*, or triennial convention of the States, and of the public games called *Tailtean*, was also a consecrated fire-hill. In an ancient life of St. Patrick, the palace of Tara is called *Grianán tea-mor Raithi*, “the great house on the sacred hill of the sun.” I ought to have observed, that the sacred

mount has, in Irish, the name of *Rath*, synonymous with *Carn*. *Rath* is also an oath, and *Ratha* is the quarterly course of the sun through the Zodiac. *Magh-adhair*, "the field of adoration," was the sacred hill, on which the kings of Thomond were inaugurated; that of the kings of Conaught was *Rath-cruach-an*, "the sacred hill of the circular heap;" that of the kings of Ulster was *Rath-Emain-macha*, "the sacred hill of the plain of Emania;" that of the kings of Leinster was *Rath-al-maine*, "the sacred hill of the stone of wealth;" and that of the kings of Cashel was *Rath-Caisil*, "the sacred hill of the stone of tribute." So venerated to this day are these *Raths* by the peasantry, that they cannot be prevailed on to touch them with the spade or plough, fancying that they are inhabited by the spirits of the illustrious chiefs and sages of antiquity; who, they say, are heard eternally grieving or rejoicing at the bad or good fortunes of Ireland. The Aranites, above all others, indulge in this harmless illusion, to a degree scarcely credible.

With all these convincing proofs of the distinguished sway of Irish Druidism, Mr. Pinkerton, in his Inquiry into the History of Scotland, dogmatically asserts, that there was never a Druid in Ireland! This is not the only absurdity, into which that laborious antiquary had been led by his Gothic visions, and his invincible contempt of Celtic history.

It cannot be doubted, that the Irish Druids were a landed clergy; so our annals testify;—for instance, in the case of the Druid *Mogruth*, who had a large grant of lands about Fermoy, made to him and his posterity, in the third century, by the king of South Munster.

I do not find, that the Druids of Ireland were exempt from military services, nor that their persons were always held sacred. The Druid *Dadera* was killed in battle by *Eoghan*, the son of *Oliol*, king of Munster. *Mogruth* was the bravest man in the wars of

king *Cormac*; nor less valiant was *Dubcomar*, the chief Druid of king *Fiacha*. I could give many more instances, to the same effect, which would make one conclude, that the system was far more enlarged and enlightened in Ireland, than on the continent.

The Druids of Ireland had, like their brethren elsewhere, their sacred gems, herbs, stones, &c. The Bishop's See of Clogher had its name from one of these consecrated stones, covered with gold, on which stood *Kermand Kilstach*, the Mercurius Celticus of Ireland: *Cloch-oir* signifies the *golden stone*. Arklow and Wicklow were so called from these sacred stones, the words being originally *Ard-cloch*, and *Buidhe-cloch*, meaning the *high stone* and *yellow stone*. The Greeks, Romans, and other nations, were in the habit of setting up rude square stones, honouring, perhaps representing, their divinities. I must not forget the famous *Liafail*, or "stone of Destiny," on which the heathen monarchs of Ireland were inaugurated at Tara. The ancient Irish had a persuasion, originated and supported by the Druids, that in what country soever this stone remained, there one of their blood would reign. Its first introduction among the Irish Kings is too old for the grasp of history. What is certain is, that, about the commencement of the sixth century, it was sent to *Fergus mac Eirc*, the first actual King of the Scots of North Britain, in order to secure his regal sway in that country. From Argyle, the original seat of the Dalriadic princes, it was removed to Scone in 842, by Kennet II. on his conquest of the Pictish territory, From Scone it was brought away in 1300 by Edward I. of England, who had it placed under the Coronation-chair at Westminster, where it now remains. Such is the respect, still paid to a heathen prophecy!

From the explanations I have endeavoured to give on the subject of Druidism, one conclusion, and a material one, is, I think, per-

fectly obvious ;—it is, that the Druids and early inhabitants of those islands, as well as of the continent, had the use of letters, *litterarum secreta*. Cæsar so testifies for the Celts of Gaul—as Strabo has done for those of Spain, with their written poems and pedigrees 6000 years old.* The ancient colonists of Britain and Ireland directly came over from Gaul and Spain, and *must* have imported the learning and religion of the parent countries. To suppose the contrary would be an absurdity of the grossest kind ; equally opposed by positive evidence, by the analogy of things, by the history of nations, and by common sense. That the Pagan Irish had the use of letters is demonstrated, beyond all question, by their existing annals, their ancient alphabet, their astronomical acquirements, their system of chronology, their immemorial veneration and legal provisions for learning, and by the internal and convincing evidence of the character and constitution of their priesthood. When I talk of letters in pagan times, I do not, of course, mean the modern *abgiter*, or alphabet, employed by our Christian annalists, and introduced into this island with the Christian faith. I mean the primitive and universal characters, brought by the Phœnicians to Greece, and to their several colonies throughout the west. The Gauls, according to Pliny, used the Ionic letters ; who also says, that the Latins and Greeks anciently employed one common character, as is proved from the table written in Rome by Nausicratas the Athenian. Herodotus testifies, that, in his time, the Ionic and Phœnician letters were the same, as were originally the Phœnician and Hebrew. † It is to this universal source we have a right to trace the early use of letters in the Britannic Isles, visited, as they had been, by the Phœnicians, the civiliziers of the barbarians of Europe. Of the incursions into

* Lib. 3. nova Edit. Oxon, t. 1. p. 152.

† Postellus De Fœnicum Literis, apud Havercamp, v. 2.

Ireland of this enterprising and enlightened people, our remote records make repeated mention.

I have incorporated my thoughts upon Druidism with the present account of the Isles of Aran, because these Isles abound with the most unequivocal vestiges of that famous religion, evident as they are in the customs, traditions, and mode of thinking of the inhabitants, as well as in the numerous fire-temples which every where meet the eye. Perhaps in no portion of the Celtic world could one, at this time, be more powerfully and faithfully reminded of the primitive manners and religious notions of the Celts.

SECTION FIFTH.

ECCLESIASTICAL HISTORY.

It seems to have been an invariable rule with the early missionaries of Christianity, in all countries, to erect the temple and forward the worship of the Almighty, most particularly, on the site of the altar of heathenism. The Isles of Aran are in strict evidence of this fact. The islanders were converted to Christianity in 420 by St. *Ibar*, one of the four Irish bishops, who propagated the Gospel in Ireland, before St. Patrick. He was born in Ulster, and directly descended from the Kings of that province. On arriving in his native country, where he zealously laboured in the holy purpose of his mission, the first object of his care was the conversion of the people of Aran, then eminently distinguished as the much resorted school of Druidism. His next residence was on the plains of Gesell, where he converted many, and was respected by all. After a well spent life, uninterruptedly devoted to the best offices of religion, this

holy man died at an advanced age, and was interred at Inisbeigere, in Leinster.*

It has been already observed, that *Aengus*, the first Christian King of Munster, had piously bestowed Aran on St. *Endea*; who, A. D. 480, founded on Great Aran an abbey, called after him *Kil-Endea*, of which he was the first abbot.

He also erected ten cells, or monasteries, which were subordinate to the abbot, one half of the island being appropriated to the support of the former, and the other half to that of the abbey. The ruins of that edifice stand nearly at the eastern extremity of the island, and in the opposite direction are the remains of seven churches, dedicated, it is supposed, to St. Breacan. One of them is, after him, called *Tempeil-Breacain*, near which is a holy well. These consecrated wells are numerous throughout the island, as are Christian altars, stone crosses, and other reliques of early piety; all which are held in high veneration by the Aranites, who frequently spend whole hours in going round them, fervently praying, and performing other acts of devotion. It is on record, that thirteen churches, beside the monasteries already mentioned, had formerly stood on the island. St. *Endea*, was the son of *Conal Dearg*, and of noble descent. He died early in the sixth century, full of years and of sanctity, and is commemorated on the 21st of March. His successor in the abbacy was *Benedict*, the brother of *Kieran* of Saiger. The following list of Abbots, though incomplete, is the best that could be selected from Usher, Colgan, Butler, and the Monasticons:

Endea, died early in the sixth century.

Benedict, successor to *Endea*.

Cronan, precise date uncertain.

* Annals of Inisfallen, *ad ann.* 420. Ogygia, *passim*.

A. D.

650. *Nenius* or *Nehemius Hua Birn*, comorb of *St. Endea*, died this year on the 19th of June. His effigies may be seen in the church-yard of *Teaglagh-Endea* in this island.
703. *Colman Mac Comain* died this year.
755. *Goimdibla* died this year.
865. *Moeltudius Mac Gobhain, &c.*
916. *Egnech, &c.*
1010. *Flann Hua Donchadha, &c.*
1017. *Gormgal*, anniversary 5th of August.
1110. *Flann Hua Noedha, &c.*
1114. *Moel-Columb Hua Cormacain, &c.*
1167. *Gildagonius O'Dubhagain &c.*

About the year 1020, the abbey of *St. Endea* was destroyed by fire. In 1081, it was pillaged and destroyed by the Danes, but soon after re-edified.

In *Inismaine*, are the ruins of two churches dedicated to the *Virgin Mary*, and subordinate to *Kil-Endea*.

Inissere was anciently called *Aran-Coemhain*, being under the patronage of *St. Coemhan*. Here there were three churches: *St. Coemhan's*, *St. Paul's*, and *Kil-i-gradhan-domhain*, in which latter *St. Gobnata* was honoured on the 11th of February. To *Kil-Coemhain* was attached a celebrated monastery founded by *St. Fechin*.

A *Franciscan Friary* was founded in *Aran*, in 1485.* *St. Brendan* frequently visited these islands. There is a beautiful farewell poem to *Aran*, which is ascribed to the celebrated *Columb-kil* of *Hy*, the *Apostle of the Picts*. Whether this honour had been intended for the *Isles* now under consideration, I cannot determine, because,

* *Monast. Hibern. Butler's Saints. Hibernia Dominicana, Appen. p. 747, &c.*

in their ecclesiastical history, I meet no mention of this truly great and holy man.

So celebrated was Aran for the numbers of holy men, who crowded to its shores and were interred in its cemeteries, that it obtained the appellation of the *Island of Saints*, *Ara-na-Naoimh*, an honour also conferred upon Ireland. The author of the life of St. Kieran informs us, that in this island a multitude of holy men resided, and that there were interred numberless saints, too numerous to be known, only to the Almighty God.* In fact, it was for centuries the chosen retreat of sanctity and learning,—of clerical students, anchorites, and confessors. The islanders have a tradition, that 740 persons, of this description, had arrived there, at one time, in a body, for obtaining instruction, and forming habits of contemplative holiness. What a remarkable transition from the thick darkness of heathenism to Christianity's brightest splendors!

The following document is extracted from a survey and division of the lands, within the Islands of Aran, belonging to the bishoprick of Anaghdown, taken at Arkin, on the 6th of October, 1590, before John Enot Esq. third Baron of the Exchequer, and others:—
“The three islands called the Islands of Saints, and commonly known by the name of the Isles of Aren, are divided into three parts, of which one belongs to the Archdiocese of Tuam, in right of the bishoprick of Anaghdown, except a parcel called Canonaght or Farinneprioraght, which belongs to the Queen in right of the monastery of Anaghcoin, upon which there is a ruined edifice, called Monastroconnaught.”†

The present view of the ecclesiastical history of Aran closes with

* In qua Insula multitudo virorum sanctorum manet : et innumerabiles sancti, omnibus incogniti nisi solo Deo omnipotenti, ibi jacent.

† Ex offic. cap. Rem.

the period of the general decadence of the Irish abbeys and monasteries. A further detail would be inconsistent with my present limits.

SECTION SIXTH.

GENERAL APPEARANCE.—MODERN STATE.

The approach to the Isles of Aran presents a view awfully sublime. Elevated high above a wide tract of deep and boisterous ocean, and opposing to the beating billows an impregnable and perpendicular barrier of massy and lava-coloured rock, several hundred feet high, one may easily associate with the sublimity of the scene, and its Alpine grandeur, something of the terrors of a Vesuvian eruption, or of that violent shock, which is supposed to have torn these isles from the neighbouring continent. Our annalists insist on the latter event; and the late Mr. Kirwan is entirely, though unknowingly, with them. In a note on his "Primitive State of the Globe," page 58, he thus observes :

"The bay of Galway appears to have been originally a Granite mountain, shattered and swallowed during this catastrophe; for, fragments of granite are found on its northern shore, though none in the neighbouring mountains, which are chiefly argillitic. And so a vast mass of granite, called the Gregory, lately on one of the isles of Aran, one hundred feet, at least, above the level of the sea, ten or twelve feet high, as many broad, and about twenty in length; though the whole mass of this island consists of compact line-stone, and no granitic hill within eight or ten miles of it. This was shattered by lightning in 1774."

As you advance close to the islands, you observe craggy and

stupendous rocks, sharply shelved towards the base, and presenting winding cavities, formed by the raging and constant dashing of the waves. The scenery on these islands is bold, romantic, and pleasing, surrounded with a tract of ocean, almost entirely boundless to the eye. Their upper surface is a tissue of barren rocks, interspersed beneath with numerous verdant and fertile spots, of a shallow gravelly soil, and lime-stone bottom, producing good and early crops; the only manure being sea-weeds, and no summer fallow for the destruction of the weeds, which over-run all that is arable. Near the shore the soil is sandy, and generally mixed with a rich loam. The prevailing crops are potatoes, rye, and a small kind of black oats, all which ripen early, and are of good quality, and sufficiently productive. The islanders sow some small quantities of barley and wheat, and in that operation employ an increased quantity of manure. They have also small crops of flax. On the whole, their harvest seldom exceeds domestic consumption; agriculture, however, is daily improving. Their pasture land is appropriated to sheep, goats, and a few small cows and horses, for which latter they reserve some meadow. The mutton is considered delicious; but their most profitable stock consists of calves, which are reputed to be the best in Ireland.

The general longevity of the inhabitants proves the excellent temperature of the air. There is a late instance of an Aranite having died at, or about, the age of one hundred and fifty. It was this excellence of climate that gave rise to the fable of the incorruptibility, in these islands, of all dead and uninterred bodies, such as Cambrensis and others have foolishly related. This quality of the air, together with sobriety and industrious habits, accounts for the hardness, strength, and activity of the inhabitants. Here nothing is known of the gout, rheumatism, &c. nor of any of those ar-

tificial diseases which idleness and intemperance engender among the more opulent and self-called civilized classes. The frugal meal of the Aranite, and his active habits, secure to him those inestimable blessings, to which the pampered and the great are strangers—serenity of mind, good health, and green old age.

The isles abound with a variety of medicinal and sweet herbs—**HOREHOUND**, Diandria Monogynia, *Lycopus*, *Hibernis* Feoran Cussaigh—**DIDYNAMIA** Gymnospermia, *Ballota*, *Hibernis* Grafan.—**MAIDEN-HAIR**, Criptogenia, *Adiantum vulgare seu Capillus Veneris*, *Hibernis* Dubhcosach.—**CAMPHOR**, Pentandria Digynia, *Crithmum*, *Hibernis* Grenuig.—**JUNIPER**, *Juniperus Vulgaris*, *Hibernis* Uhar Traighe.—**MINT**, Didynamia Gymnospermia, *Mentha*, (aquatica) *Hibernis* Cartloinn.—**THYME**, Didynamia Gymnospermia, *Thymus*, *Hibernis* Thiene.—**GARLICK**, Crow or wild, Hexandria Monogynia, *Allium Sylvestre tenuifolium*, *Hibernis* Gairleog Muire ;—the latter grows in such quantities as to impart its flavor, very strongly, to the milk and butter produced in this place. So various and abundant are spontaneous plants, that here a botanist would find ample and profitable employment. They have a plant, in Irish “*Rineen*,” in English “*Fairy flax*,” (Pentandria Pentagynia, *Linum foliis oppositis ovato-lanceotis caule dichotomo, corollis acutis*,) and in this they greatly confide, for its medicinal virtues, almost in all cases. The tormentil root, (*Icosandria Polygynia*, *Tormentilla*,) serves them in the place of bark for tanning leather. There is a native vegetable, the name of which I now forget, which gives a fine blue die, much used in colouring the woollen which the Islanders manufacture for their wearing. The kitchen gardens are well supplied with every necessary vegetable.

The islands were anciently covered with wood, as is evident from the numerous trunks of fir, pine, oak, &c. found in the peat bottoms

and marshes. Wild ash and hazel grow in several places, among the rocks and cliffs. With the exception of these and a few solitary shrubs, the whole surface is quite denuded.

Although there are no rivers in any of the isles, there are numerous springs and streamlets; which, however, in dry seasons, afford a very inadequate supply, in which case recourse is had to the continent for fresh water.

Fish, kelp, and yearling calves, are almost the only articles of traffic; Galway, and the surrounding country, the chief mart. There are belonging to the three islands about 120 boats, 30 or 40 of which have sails, and are from five to ten tons burden; the rest are row boats. The spring and beginning of summer are employed in the Spillard fishery; here are taken immense quantities of cod, ling, haddock, turbot, gurnet, mackrel, bream, &c. and, in the season, abundance of lobsters, oysters, crabs, scollops, cockles, muscles, &c. They look much to the herring fishery, which sometimes disappoints, but generally gratifies their best expectations. In May, the pursuit of the sun-fish gives employment to many. This rich supply of sustenance seems perfectly providential, when we consider the scanty soil and dense population of the islands. After high tides, the water, lodging in the caverns and cliffs exposed to the sun, soon evaporates, and leaves a residuum of good strong salt, with which the Aranites, I understand, cure their ling; it also serves them for culinary purposes. Within forty miles of this coast is the great cod-bank, which is supposed to reach to Newfoundland.

The annual average of kelp, made in the islands, is computed at from 150 to 200 tons; it is considered to be of very superior quality. The yearling calves generally brought, before the late fall of prices, from £7 to £8 a piece.

The numerous and lofty cliffs of Aran are well stocked with puff-

fins, which are sought for by the agent, Mr. Thomson, chiefly for the sake of the feathers. He employs cragmen, or clifters, to procure these birds, allowing 6*d.* for every score they bring. The operations of these cragmen are not less perilous than curious. They provide themselves with a large cable, long enough to reach the bottom of the cliff; one of them ties an end of this rope about his middle, holding it fast with both hands; the other end is held by four or five men, standing one after the other, who are warned by the cragman, when arrived at the haunts of the puffins, to hold fast. Here the cragman gets rid of the rope, and falls on the game with a pole, fastened to which is a snare he easily claps on the bird's neck, all being done at night; such as he kills he ties on a string. His comrades return early the next morning, let down the rope, and haul him up. In this way he kills from fifteen to thirty score per night. Quantities of large eggs are also taken out of these deep cliffs. In the summer of 1816, two unfortunate men, engaged in this frightful occupation of cragmen, missed their footing, and were instantly dashed to pieces.

Hares and rabbits abound in the islands, as do land and water fowls, plovers, wild pidgeon, gannets, solan geese, ducks, &c.

Dun-ængus, the very ancient fortification already mentioned, stands on a great precipice hanging over the sea. It is extremely rude, being composed of large stones, roughly heaped on, without cement of any kind. Within its area it may contain about 200 cattle. There is another *Dun* much of a similar description. I have already given the history of both, so far as their extreme antiquity admitted; remnants more ancient, in point of military architecture, are certainly not to be found throughout the British isles, nor perhaps throughout Europe. The other *Duns*, seen here, are of no note. The three caverns, called the puffing holes, are at the south extremity of the

island, (the greater Aran) about twenty perches from the sea, and present a rugged side of stupendous and continuous rock. With a strong westerly wind, these deep and awful abysses, so indicative of some great convulsion, emit prodigious columns of water to the height of a ship's mast, accompanied by great quantities of sea-weed minced to minute particles.

Here the Aurora Borealis, in all its sportive and beautiful evolutions of light, frequently delights the eye of the spectator.

There has been discovered, I know not in which of the islands, a very fine vein of dove-coloured marble, which promises to be of much value in the artists' hands.

The great isle of Aran is about nine miles in length, and its greatest breadth about one mile three quarters. In the centre is a signal tower, and a light house, exhibiting a brilliant revolving light. Its south boundary consists of immense rocky cliffs, sixty or seventy fathoms deep; on the north are low shelving rocks and sandy beaches. There is but one safe harbour, with soundings from two to five fathoms, and a sandy bottom. In the road, vessels of 400 tons burden may ride with safety in fair weather.

The middle isle is divided from the larger Aran by Gregory sound, which is about four miles broad, and navigable from shore to shore. This island is of a triangular form, and about eight miles in circumference. Its acute angle is lofty and rugged, and terminates in a low sandy beach. Its base and one of the sides is boldly perpendicular.

The southern isle is divided from the last mentioned by a foul and dangerous sound, about a league in breadth. This island is computed to be four miles in circumference, and about one-and-a-half in length, and three quarters in breadth. Its boundaries are low. The channel, dividing it from the county of Clare, is about three leagues in breadth. There is a signal tower, and near it an old

castle on an eminence. Here is shewn what is called the "Bed of St. Coemhan," much famed for its miraculous cures, through the mediation of the Saint, of infirm persons, particularly the lame and blind. On this island, towards the east, is a deep lake, about a quarter of a mile in circumference, surrounded on all sides, except at the east, by a rock of considerable height. It is open at the side next to the sea, from which it is only about forty perches distant. This lake could be converted into an excellent harbour, by cutting across these forty perches, which happen to be composed solely of loose craig.

Contiguous to Aran are three small islands, two of them about eight acres in extent, and for the greater part pasturage; the third is a barren rock, containing about two acres, and producing a great quantity of excellent sea weed.

These several islands are the estate of Mr. Digby, as has been already mentioned. This gentleman is considered one of the best of landlords. He allows annually 20 guineas to school houses, for the instruction of orphans; and £20 annually for clothing the poor, with other pecuniary donations. His annual rental, on the islands, is £2700. Mr. Thomson, his agent, visits them twice a year, not only to receive rents, but to adjust all differences. The quit and crown rent of the isles is £14. 17s. 0 $\frac{3}{4}$ d.

I have already glanced at the character of the people, and have stated, that in language, habits, and customs, they retain, beyond comparison, more of the primitive Celtic character than any of the cotemporary tribes of that stock, at least, in this kingdom. Sequestered and almost unmixed as the Aranites have been for a long succession of generations, history has always considered them as full of that ancient spirit, which has been elsewhere made to disappear by the force of revolutionary and colonial innovations. To de-

lineate the character and peculiarities of the Aranites of the present day is, in fact, to call forth associations, mounting up not only to the times of Christian celebrity in this country, but even to the days of our sages and warriors of heathenism. Their immemorial traditions and practices may, without stretch of imagination, be viewed as the graphic annals of "olden" days.

Here you have, on every lip, the exploits of *Cuchullan*, of *Conal Cearnach*, of *Gol* son of *Morna*, of *Fionn* son of *Cumhal*, of *Oisin* and of *Oscar*; here they enthusiastically point out the very places which these *invincibles* had honoured with their presence; and here they tell us, their spirits rest, as in Elysian Isles! Here, too, no bad memory is retained of the sacred fires, and of the priests of the Sun, so constantly refreshed is tradition by the numerous and unequivocal memorials of the Celtic ritual, still preserved in Aran. But the Aranites have preserved a far better recollection—that of the Christian holiness, which had so preeminently distinguished their "Isle of Saints."

I shall point to a few of their practices, which certainly will be found quite primitive. They divide their lands into twenty-four quarters, which are subdivided into half quarters, into cartrons and half cartrons, and fourths, called in Irish *Cnogerá*. This was the common practice among the Celts of Europe. Their dress is a short jacket, reaching a little below the waist, wide trousers down to the instep—their shoes simply a piece of raw cow hide, a little longer than the foot, and stitched close at the toe and heel with a piece of fishing line. The female head dress is completely the old *Baraid* of the Irish. Though all this does not precisely meet our ideas of the ancient Irish costume, yet it comes close to them. The Irish is the only language in the islands, where it is full of primitive words, not intelligible even on the neighbouring continent.

The people of Aran, with characteristic enthusiasm, fancy, that at certain periods, they see *Hy-Brasail*, elevated far to the west in their watery horizon. This had been the universal tradition of the ancient Irish, who supposed that a great part of Ireland had been swallowed by the sea, and that the sunken part often rose and was seen hanging in the horizon: such was the popular notion. The *Hy-Brasail* of the Irish is evidently a part of the *Atalantis* of Plato; who, in his *Timæus*, says, that that island was totally swallowed up by a prodigious earthquake. Of some such shock the isles of Aran, the promontories of Antrim, and some of the western islands of Scotland, bear evident marks. Modern philosophy does not dissent from this ancient hypothesis. There are various and unequivocal marks, leading to a rational presumption, that great portions of this globe had been depressed and swallowed up by enormous masses of water, rushing in opposite directions. How could the ignorant Aranite receive such a notion except by immemorial tradition? But, it is only to an unmixed, aboriginal people, that such a tradition as this could descend unimpaired, through the long and tedious stream of ages.

Analogies may be easily multiplied, in the present contemplation. Enough, however, has been said to establish a conviction, that in no part of the Celtic regions are the Celtic habits, feelings, and language, better preserved than in the southern Isles of Aran.

The following Statistic table, officially drawn up, gives a correct view of the amount of the population of the three Islands of Aran, with other particulars.

TABLE.

DENOMINATIONS.	HOUSES.			PERSONS.		OCCUPATIONS.				SCHOOLS.			
	Inhabited.	Families Uninhabited.	Build- ing.	MALES.	FEMALES.	TOTAL OF PERSONS.	No. of PERSONS chiefly employed in AGRICULTURE.	No. of PERSONS chiefly employed in TRADES, MANUFACTURES, or CRAFT.	No. of ALL OTHER PERSONS occupied and not comprised in the two preceding classes.	Total NUMBER of PERSONS OCCUPIED	Males.	Females.	TOTAL.
Innisbeer	59	61	1	218	199	417	71	48	68	187	31	9	40
Innismane	62	65	1	198	188	386	105	83	37	225	19	1	20
Killeany	178	185	6	545	518	1063	123	160	191	474	46	12	58
Oaghill	66	68	3	211	176	387	82	38	39	159	46	23	69
Kilmurway	68	72	—	231	200	431	101	46	29	179	—	—	—
Onought	65	66	1	209	186	395	118	78	16	212	19	8	27
	498	517	2	1612	1467	3079	603	453	380	1436	161	53	214

An Essay on the subject proposed by the Royal Irish Academy, viz. "An Essay on the nature and influence of the Ancient Irish Institutes, commonly called Brehon Laws, and on the number and authenticity of the Documents whence information concerning them may be derived; accompanied by Specimens of Translations from some of their most interesting parts." With an Appendix, containing a Catalogue of the principal Ancient Irish Laws, to be found in the MSS. Library of Trinity College, and other Libraries. A Prize Essay. By Edward O'Reilly.

Read June 28, 1824.

“Ἐβαλεν ἑαυτὸν (i. e. an n̄j fεραδαὸς fιοῖφάετνας) η̄ huaylyžtar naç m̄bpeceamañ maañ
φαγὰς f̄jyñe f̄jartar.”

Ибале Мхомаñ.

“ Say unto him (*i. e. the King Fearadhach Fionnfachtnach*) every Judge is not to be elevated if
he be not confessed to be skilled in the truth.”

Testamentary Precept of Moran.

PRELIMINARY OBSERVATIONS.

THE ancient Institutes of Ireland by English writers generally, but improperly, called *Brehon Laws*, are so little known to modern times, that some have absolutely denied that such documents exist, and have boldly asserted that the ancient Irish never had a code of

written laws ; that their *oral* laws were calculated only for a nation of barbarians, and were as variable and as numerous as there were different tribes in the Island. Others admit, that the Irish had written laws, at a very early period of their history, but exclaim against them as unjust and oppressive, having in every respect an immoral tendency, destructive to the happiness of the people and preventing the improvement of the country :—whilst on the other hand, there have not been wanted some liberal and candid writers of the sister country, of no small celebrity in the literary world, who assert that the Irish Institutes were founded in reason and justice ; that they were administered with strict impartiality ; and, consequently, that they afforded protection to all classes of people, without distinction, and were productive of happiness and comfort to the nation, leaving none in distress or in a state of pauperism.

To lay open these adverse opinions, and examine them by the test of truth ; to state fairly from incontrovertible facts what was the nature and the tendency of the ancient Irish laws, and to direct the reader to where copies of those laws of considerable antiquity are to be found, is the design of the following pages. On an inquiry into this matter, so much talked of and so little known, even to professed Irish scholars and antiquaries, and upon which so many conflicting opinions have been formed, the author of this tract finds considerable difficulty to proceed with that clearness and precision which so interesting a subject deserves. In matters of conjecture, it is with no small degree of diffidence that he submits on the nature and influence of the ancient laws of his country such of his opinions as are in opposition to those delivered by eminent writers who have viewed those Institutes in a different light. But, when supported by matter of fact, to which, in pursuit of his subject, he has

as closely as possible adhered, he offers his opinions with confidence, and courts the investigation of the candid and intelligent.

To those who deny, that the ancient Irish had written laws, the best answer, perhaps, that could be given, would be a reference to the documents in which they are to be found; or to the extracts from those documents exhibited in the following pages. It may not, however, be improper to observe, that, if even these ancient monuments did not now exist, it would not amount to a proof that such have not existed in former times; and, if even the Irish had not any *written* laws at an early period, still it would not be a sufficient proof that the natives were a lawless race, and a nation of barbarians, which seems to be what was intended by those who have asserted that they had not any *written* law. If the absence of *written* law in a nation were a proof of barbarism, the Athenians must have been barbarians; for they had not any such laws for the long period of one thousand years, until at length they received them from Draco, in the first year of the 139th Olympiad (A. M. 3326), a hundred years after the period at which our monarch, Ollamh Fodhla, (Olav Folla) promulgated his code, for the better government and improvement of his people. The same argument would also hold good against the English themselves, whose common law remained *unwritten* for ages, although by it their country was governed, and justice administered, long before the existence of statute laws; and by it, even at the present day, innumerable important controversies are decided.

But that the Irish were not without laws, and even *written laws*, at a very early period, the concurrent testimony of some of the most respectable writers of English birth, or descent, as well as of many of our native writers, shall be hereafter submitted to the consideration of the candid reader; and if it shall appear, that the Irish have had

laws at an early period ; that those laws, or the major part of them, were brought in by the first Milesian or Ibero-Celtic colony ; or were soon after framed from national customs, and that they continued to be the law of the land to the commencement of the seventeenth century, without suffering any material change in consequence of the invasion of the Danes and Norwegians, at the latter end of the eighth century, or that of the Anglo-Normans in the middle of the twelfth ; it may be presumed, that a publication of them must infallibly furnish materials to the historian and antiquary, of more importance than, perhaps, any other European nation could supply.

The Irish historians agree, that Ireland received colonies from Gaul and Britain, antecedent to the Scoto-Iberian colony under the sons of Gollamh (Gullav), or as he is otherwise called *Mile Spaineach (the Spanish hero)*, from whom the ancient Irish families derive the name of Milesians. These colonies, in process of time, became so intermixed as to form but one people, observing the same customs, and subject to the same laws. The Irish Institutes must, therefore exhibit a picture of ancient Celtic manners, and throw more light on the history and antiquities of several ancient nations, and particularly those of Britain and Ireland than can, probably, be obtained from any other quarter. Several learned foreigners have declared, that a knowledge of the Irish *language*, and of Irish *history*, are necessary for the complete elucidation of the history and antiquities of ancient Celtic nations. Upon this subject the opinions of the late Doctor Johnson, and the late Edmund Burke, are so well known as to render quotations from them unnecessary. But it may not be improper to observe, that, if the Irish *language* and *history* be necessary to elucidate the history of other ancient nations, the knowledge of the Irish *laws* is of much more importance ; as by

its aid several passages in ancient history (Irish as well as others) will appear luminous, which are now enveloped in obscurity.

II. *The Irish had written laws at an early period.*

That the Irish had *Breitheamhuin* (Brei-hoo-in, *i. e.* judges), and *Reachtairidh* (Ragh-ta-ree, *i. e.* lawgivers), from the earliest period of their history, is asserted by all the native *Seanchaidheadh* (Shan-a-hee, *i. e.* historians and antiquaries). The Milesian colony, on their first landing in Ireland, were attended by Amergin, in the quality of judge,* and the office was never abolished as long as the Irish continued to be governed by their own laws. That the Irish laws were committed to writing, little doubt will be entertained by those who consider the great love for literature, for which the ancient Irish were so remarkable. It is well known, that they took the greatest possible pains in committing to writing the records of the nation, their pedigrees, and the productions of their bards; and surely it is not probable, that, whilst they were so careful in the preservation of these things, they were so silly as to neglect the preservation of their laws, upon which so much of the happiness and quiet of the people depended.

There is still extant an ancient Glossary † of the Irish language,

x 2

* See the *Leabhar Gabhala*, or book of Invasions, contained in the book of Leacan, and another of the same name compiled by Michael O'Cleary, and others.—For an account of these books, see “Transactions of the Ibero-Celtic Society, p. p. 114. 186. 189.

† Doctor Ledwich denied the existence of this ancient document, as others have denied the existence of Irish written laws. The poor Doctor, however, was one of the worst persons in the world to rely on as authority, on Irish historical or literary subjects. He was so totally ignorant of our language, that if he had the Glossary before him he could not read or understand

by some writers supposed to be written by Cormac Mac Art, monarch of Ireland, who commenced his reign A. D. 254, but by others more generally, and certainly with more truth, attributed to Cormac Mac Cullionan, King of Munster, and Archbishop of Cashel, who was killed in the battle of *Beallach Mughna* (Balagh Moona) A. D. 908. In this tract reference is frequently made to the ancient laws, and the quotations from these Institutes are numerous.

In the *Leabhar Gabhala* (Leavar Gavawla) or book of Invasions, or Conquests, compiled by the o'Clerys, we find the following passage—" *Ro ghabh tra ollamh Fodhla mac Fiacha Fionnscothaigh righe Eireann. As aire do gairthi Ollamh Fodhla de ar a bheith na righ agus na ollamh. Eochaidh a ched ainm. Do raghsat fir Eireann Ollamh in a righ uaiste, ar iomat a fheasa agus a fhoghloma, do choimhed a reachta agus a riaghla, agus ar a chalmacht aga nioncosnamh i ccathaibh agus i cconghalaibh eachtrann. As e cedas do ordaigh toiseach ar gacha triocha ced; brughaidhe ar gach baile agus a ffoghnadh uile do righ Erenn. As e cedna righ las a ndearna Fes Teamhrach a muir Ollamhain i tTeamhraigh, &c.*"—" Then Ollamh Fodhla (Ollav Fólá) son of Fiacha Fionnscothaigh (Feeagha Finn-scolay) took the sovereignty of Ireland. The reason that they called him Ollav Folla was on account of his being a king and an Ollav (a Professor or Doctor). His first name was Eohy. The men of Ireland elected Ollav as king over them, on account of the greatness of his knowledge and his learning, *to preserve their laws and regulations*, and on account of his valor to defend them in bat-

a line of it. If he were capable of reading the book, he might have satisfied himself of its being still extant, as he had access to the College Library, where in Class H. 25. he might have found an ancient copy written on vellum. The copies in private hands are numerous.

“ tles and in foreign wars. It was he who first ordained a chief
 “ over every district and a *Brughaidh* (Brooee) over every town,
 “ and all their services to the Monarch of Ireland. He was the
 “ first king by whom was held the Fes * of Tara, in the College
 “ of Professors in Tara, &c.”

The Monarch Ollav Folla ascended the throne of Ireland A. M. 3236, and reigned forty years. By the above quotation we see, that he not only promulgated laws himself, but that one cause of his being chosen by the people of Ireland to rule over them, was on account of his great knowledge and learning by which he might “ *preserve the laws and regulations already established.*”

It would perhaps be unnecessary to produce further authorities from *native* Irish writers, to prove the existence of *written* laws in this country at an early period ; but on this subject it may not be improper to cite the authorities of Archbishop Usher, Edward Lhwyd, author of the *Archæologia Britannica*, Sir James Ware, and Doctor Nicholson, Bishop of Derry. The first of these, in his “ *Discourse shewing when and how the imperial laws were received by the old Irish,*” says, “ The Irish never received the Imperial Law, but used still their own Brehon Laws, which consisted partly of the ordinances enacted by their kings and chief governors, whereof THERE ARE LARGE VOLUMES STILL EXTANT IN THEIR OWN LANGUAGE.”

The learned Welsh antiquary, Edward Lhwyd, in a † letter to the Royal Society, informs that learned body, “ that he had procured, in divers parts of Ireland, about twenty or thirty manuscripts on parchment ; and though he consulted O’Flaherty, au-

* Fes, a parliament or assembly of the States of Ireland, held at the commencement of winter, in every third year.

†. Published in Baddam’s abridgment of the Philosophical Transactions, vol. 5. p. 492.

“thor of the Ogygia, one of the chief Irish critics, and several others, they could scarce interpret one page. What is most valuable among them,” adds Mr. Lhwyd, “are their old laws, *which might give some light to the curious as to their national customs.*” Several of those volumes, with memorandums in Mr. Lhwyd’s handwriting, accounting for the manner in which he obtained them, are now in the Library of Trinity College, Dublin. These volumes were some years since presented to the Library by Sir John Seabright, in the hope that the learned Members of that College would cause some of the most valuable of them to be published, with literal translations, into English or Latin.*

Sir James Ware, in the eighth chapter of his “Antiquities of Ireland,” † says, “There are yet extant, as I have heard, some books in Irish, containing the laws of some of the ancient kings of Ireland before the coming of the English, *which doubtless are very necessary to understand the government among the ancient Irish,* AND DESERVE A FULL SEARCH.”

The Right Rev. Doctor Nicholson, Bishop of Derry, says,—“Our historians generally agree that there was, *very early*, a body of laws in this kingdom; and they do as unanimously allow that they grew up to maturity, from a very weak estate at first.—By the guidance of their law maxims, and other like rules, the *Brehons* (or judges) of several provincial kings, determined all controversies brought before them; and their general axioms were the *leges Brehonicæ, whereof several specimens are to be seen in our public and private libraries.* The most complete collection that we have of these is in the Duke of Chandois’ library, and even this is far from being perfect. It contains twenty-two sheets and

* See Edmond Burke’s letter to General Valancy.

+ Folio edition, Dublin, 1705, page 23.

“ a half, close written in two columns; the former whereof is not
 “ quite legible, and full of abbreviated words. It puts me in mind
 “ of HOEL DHA’S LAWS; several copies whereof (that I have seen)
 “ are in the like condition: but as there is now an accurate edition
 “ of these in the press of London, so I am willing to hope that I
 “ may live to see the like care taken of our *Brehon Laws*. *This I*
 “ *dare promise the antiquaries and historians of this kingdom, that*
 “ (if they fall into the hands of as skilful a publisher as the Welsh
 “ laws are in) *we shall have a very delightful and instructive view*
 “ *of many ancient rites and customs of this country, which, as yet,*
 “ *continue in the utmost darkness and obscurity.*”*—Again, speak-
 ing of the law books of the Irish, he says,—“ Mr. Conroy can
 “ furnish out a very large addition to this stock. He has the de-
 “ cisions or reports of no fewer than thirty-three of our ancient
 “ Dempsters, the oldest whereof are judgments given in the first
 “ century after our Saviour’s Incarnation, and the youngest in the
 “ tenth. For some of these he acknowledges himself indebted to
 “ Mr. P. Mahon, the present worthy Dean of Elphin.”†

Here we have the authority of Cormac and others to show, that the Irish had laws long previous to his day; and we have the authority of candid and learned English writers to prove, that several volumes containing copies of those laws were extant so late as the beginning of the last century. The following pages will show, that, at the present day, there are in existence several copies of the same laws contained in manuscripts of great antiquity, in public and private libraries. We have also the authority of those liberal and learned writers to state, that the ancient laws of Ireland are “capa-
 “ ble of giving light to the curious as to our national customs; that

* Irish Historical Library, p. p. 133, 134.

† Ibid. Appendix p. 245.

“doubtless they are very necessary to understand the form of government among the ancient Irish, and deserve a full research ;” and that, from a publication of them, “we shall have a very delightful and instructive view of many ancient rites and customs of this country, which as yet continue in the utmost darkness and obscurity.”

For the existence of some of the ancient Irish written laws, so low as the reign of James the first, we have the authority of Sir John Davis, who, in his first letter to the Earl of Salisbury, * mentions an ancient Roll, containing an account of the various articles payable to Maguire, Chief of Fermanagh, by the subordinate chieftains, or heads of tribes, within his principality. The Roll was kept by O’Brislane, the principal Brehon of the country. It was written on both sides in a fair Irish character, and it was with great difficulty he could be prevailed upon to suffer it out of his hands to be copied.

But that the ancient Irish laws did exist, and were even in force, down to the days of James the first, does not depend upon individual authority ; nor are there wanted proofs to show, that they were in some districts practised so late as the latter end of the unfortunate reign of the first Charles. To exclude those laws from the English pale, an act was passed in the parliament held in Kilkenny in the fortieth year of the reign of Edward the third. By this act it appears, that the Irish laws had been pretty generally adopted by the English colonists in preference to those of their own native country. Hence it may be concluded, that these English conceived the Irish laws to be preferable to their own ; and it may not be improper to remark, that in the Anglo-Irish Parliament held in the 33d and 35th

* Historical Tracts, 8vo. Dublin 1787, page 253.—Collect. de Reb. Hib. Vol. I. p. 159.

years of Henry the Sixth, acts were passed making the English Chief, or head of a family, accountable for his sons and his dependants, and liable to be punished for any crimes they might happen to commit, in the same manner as the Irish laws made the whole tribe accountable for the crimes of any of its members. But the Statutes of Kilkenny, it would appear, did not abolish the Irish laws, even amongst the English colonists; for instances are not wanted to show, that by those laws many of the great English settlers regulated their differences, so low down as the reign of Elizabeth. And from all the letters patent, bestowing or granting offices, during the entire reign of Charles the First, it is evident that even then the Irish laws were not totally abolished. For, in each of these patents, clauses are inserted, binding the patentee, under the forfeiture of his grant, and all the benefits to be derived from it, that "he shall cause all his family, &c. to use the English language, and that he shall, as far as his power extends, abolish the *Brehon law*, and establish the common law of England."

III. *The Irish laws at the commencement of the seventeenth century, varied but little from what they were at an early period of Irish history.*

That the Irish had written laws at a much earlier period than some writers are willing to allow, has, it is submitted, been proved in the foregoing pages. That these laws were first promulgated in a very remote period, the laws themselves bear internal evidence. Therefore, if they have not suffered some very material changes in the lapse of ages, they must, it may be presumed, exhibit a faithful picture of ancient opinions, customs, and manners, that may

tend to elucidate the history, antiquities, manners, and customs of several continental nations, deriving their origin from the same source as the ancient Irish, as well as of the Irish themselves. This opinion we have seen, agrees with the opinion given of them by Archbishop Usher, Sir James Ware, Edward Lhwyd, Doctor Nicholson, Bishop of Derry, and others. Let us now see whether those laws have undergone any, or what changes, by the introduction of Christianity into the Island, or by means of the invasions of the Danes, or of the Anglo-Normans; the only occurrences that could cause any material alteration in those Institutes from their first formation, until the commencement of the seventeenth century.

The Irish, from their earliest settlement in the island, were never conquered, nor even invaded by any foreign nation, until about the year of our Lord 795, when, according to the annals of Inisfallen, the Danes made their first appearance on the coast, and plundered some of the Irish ships; and, in the ensuing year, returning with greater force, made a landing on the shore. In this long period, of about 2000 years duration, they had ample time to establish wise and salutary laws and regulations, for the well-governing of the nation, and the mutual advantages of all ranks of people. That they did establish such laws, and that those laws were founded on the ancient customs observed by their ancestors, as well before their emigration from the continent as since their arrival in Ireland, there is good reason to believe: and, although it is certain, that, in that period, they had frequent intercourse with, and often carried their arms into, the Continent; that they had formed treaties of alliance and friendship with some of the continental nations; and that, in those days, by means of commerce, the ports and harbours of Ireland were much better known to foreign merchants, than those of Britain, as Tacitus asserts, in his life of Agricola; yet, in all that

time, nothing could have occurred, that would cause any intermixture of foreign laws with our native Institutes, except so far as they might have been influenced by the introduction of Christianity. Upon that occasion, shortly after the arrival of St. Patrick, when the Christian religion had become, in a great degree, the religion of the State, we find that the ancient laws underwent a thorough revision by a committee of nine persons, specially appointed for that purpose. This committee consisted of three Kings, three Bishops, and three Antiquaries. The Kings were Laoghaire (Laya-rey), Monarch of Ireland, Corc, King of Cashel, and Daire, King of Conaught. The Bishops were St. Patrick, St. Beinin, and St. Cairneach; and the Antiquaries were Ross, Dubhtach (Duvhagh), and Fergus. Of this committee there were eight natives, and only one foreigner; of course it may be presumed, that, in the first instance, no great innovation was made on the ancient customs or habits of the people, except so far as might be necessarily introduced by the change from Paganism to Christianity. In progress of time, some portion of the Canon law might have found admittance into the common law of the country; but it is pretty certain, that no material change was affected by the admixture.

That the *Breithemhuin* (Bree-hoo-in) or judges of the Irish were well skilled in the Canon law no doubt can be entertained; but this might have happened without the native laws having suffered any alteration. Hannibal Rosselli, a Calabrian author, quoted by General Vallancy,* bears the following testimony to the skill of the ancient Irish in the Canon law. “Olim homines illius Regionis plurimum intendebant Juri Pontificio, erantque optimi Canonistæ.” “Formerly the inhabitants of this country ap-

* Collectan. de Reb. Hib. Vol. III. p. xiv.

“plied themselves very much to the study of the Pontifical law, and “were the best skilled in the Canon law.”—Not having Rosselli’s book at hand, the author of these pages cannot say from what authority he has made this assertion ; but that the Irish judges were of necessity good Canonists, may be inferred from the ancient Irish laws. For, in those it is declared that the Brehon, who is able by his knowledge to decide causes in the three laws, viz. that of the *Feneachus*, or old law, of the *Filidheacht* (*Fillee-acht*) or Poetic law, and the *Breithe Leighinn* (*Bre-he Lay-in*) or Canon law, shall have more extensive privileges and more ample rewards, than if his practice were confined to one only of those branches.*

In the latter end of the eighth, and to the commencement of the eleventh century, Ireland, in common with France and Britain, was exposed to, and severely suffered from, the predatory incursions of the Danes, and other Northern nations. This invasion of Ireland is, by some writers, represented as having brought about a total subjugation of the Irish people to those barbarians ; as was the case in France and England. Hence it has been concluded, that the ancient customs and laws of the Irish were abolished, and in their stead those of the conquerors established. That this, however, was not the case is evident from the fact, that Ireland never was, at any period, totally subjected to those foreigners. It is true, indeed, that they formed some settlements on the sea-coasts, and often made excursions into the interior of the island, where they burned many religious establishments, plundered and devastated extensive districts, and overthrew numerous armies of the inhabitants. But the annals of the country bear unanimous testimony to the melancholy truth, that in these plundering expeditions they

* See ancient Law-tract in the book of Ballimote, fol. 181.

were frequently aided by some of the native Irish princes, who, either anxious to diminish the preponderating power of some neighbouring chieftan, or desirous to revenge some real or imaginary injury or insult received, or perhaps, willing to share in the spoils of an opulent neighbour, were always forward to join the common enemy. By this criminal policy of the Irish princes, the foreigners were enabled to support themselves in the possession of a few settlements adjoining to the sea, but they never were able to make any permanent establishment in the interior of the country.

If it were not foreign to the design of this Essay, the author could, from indubitable authority, prove that Ireland was never completely subjugated by these hordes, that obtained such absolute sway in France and England. He could show, that, from their first appearance on our shores, until the total destruction of their power on the plains of Clontarf, in the year 1014, the regular succession of the Irish monarchs and provincial kings was uninterrupted; that not a month, nor even a week, elapsed in which they were not resisted, and frequently defeated with immense loss, by some of the district princes; and that nothing could have prevented their utter annihilation, at any period, from their first landing in the island, but the jealousy and disunion that always unhappily existed between the kings and petty chiefs of the country.

It must however be admitted, that, so far as the power of these foreigners extended, they ruled the people with a rod of iron, and levied the most oppressive tributes and contributions. This excited in the natives a rooted detestation for their oppressors; so much so, that, even to the present times, the lower orders of the native Irish hold the memory of these foreigners in the greatest abhorrence. But their domination was restricted within very narrow boundaries, seldom extending to any considerable distance from the sea-coasts

on five or six places of which only were they ever able to make settlements of any considerable duration. They were, therefore, unable to impose laws on the Irish in those districts where their power did not extend, and these districts comprised the major part of the entire kingdom ; and the hatred, which the natives bore to those foreigners, would prevent them from making a voluntary adoption of their customs or laws. Hence it may be concluded, that the invasion of Ireland by those Northerners could have little or no influence on the ancient and long established laws of the nation, or on the manners and customs of the inhabitants ; so that, whatever were the laws of Ireland on the arrival of those barbarians, they remained unaltered at the period of their extirpation.

We have now, it is presumed, satisfactorily shown, that the invasion of Ireland, by the Danes and Norwegians, could have caused no variation in the ancient laws of the country ; and that, with the exception of the trifling influence, which the introduction of the Christian religion might have had on the national institutions, the Irish laws must have remained as they were originally established by the natives. It remains still to inquire how far those laws may have been influenced by the domination of the English in this island, from their first invasion in the year 1169, to the commencement of the reign of James the First, in the beginning of the seventeenth century.

In the year 1167, Dermot M'Morogh, King of Leinster, of detestable memory, having, for crimes of the blackest atrocity committed by him, been expelled from his kingdom, by the united forces of Conaught and Meath, to which were also joined those of the Danes of Dublin, fled to Henry the Second King of England, then in France, to implore his assistance in the recovery of his kingdom. To induce the English king to comply with his request, he offered to

acknowledge him as his superior lord, and to hold his kingdom of Leinster as a Fief, if through his means his restoration should be effected. Henry, who had, long before, fixed a longing eye on the verdant and prolific fields of Erin, eagerly embraced the proposal of the exiled tyrant, encouraged him to attempt the recovery of his kingdom, and assured him, that he might rely with confidence on his friendship and cooperation in all things that might forward the attainment of his wishes. But, as he was then occupied in the prosecution of a war in France, and unable to give him any personal assistance, he gave him letters of recommendation to some of his barons in England, authorizing him to enlist all such amongst the English as were willing to enter into his service, and carry them with him to Ireland.

Furnished with these recommendations, and this important authority, he passed into England, where he entered into negotiations with Richard Earl of Pembroke, surnamed Strongbow, for his assistance in the recovery of his dominions, promising to give him his daughter *Aoife*, or *Eva*, in marriage, and with her his whole inheritance and the right of succession to the kingdom of Leinster, after his decease. The ambitious Earl embraced the proposal with avidity, and pledged himself to lead into Ireland, early in the ensuing spring, a chosen body of troops, that should restore the Leinster prince to the throne of his ancestors. In fulfilment of this engagement, Ireland, in the year 1169, for the first time, found her shores invaded by an Anglo-Norman enemy. Upon their arrival, Dermod, who had previously returned in a private manner to Ireland, collected as many of his adherents as he could muster, and hurried to meet his new allies. A week had elapsed before the arrival of these foreigners, and their having been joined by the Leinster forces, was announced to Roderick O'Conor, King of Conaught, then

generally considered as Monarch of Ireland. Roderick lost no time, but speedily collected his troops ; and, being joined by O'Ruairc, Prince of West Brefsny, and by O'Maelseaghlain, King of Meath, with such forces as they could collect on the spur of the occasion, marched to *Fiodh-dorcha* (*Feea-durcha*, *i. e.* the dark wood) near Ferns. Here they met with the allied Leinster and English forces, when a conflict ensued, in which Dermott and his auxiliaries were defeated, with the loss of twenty-nine Lagenian Chiefs and two of the English Knights, together with a great number of lesser note.

The annals of Inisfallen relate, that, after this defeat, Dermot went to the camp of the King of Ireland, and gave him as many hostages as he required for the territory of *Ive-kin-seallagh* ; and to O'Ruairc he gave five score ounces of gold, as an atonement for the insult offered to his wife.* There was also an obligation imposed on

* It is generally asserted by Historians that Dermot Mac Morogh courted Dervorgilla, the daughter of O'Melaghlainn, King of Meath, before her marriage with O'Ruairc (or O'Rourke), Prince of Brefsny ; that a mutual affection existed between them ; that her father would not consent to their union, but forced the young lady, against her inclination, to take for her husband O'Ruairc, for whom she never had any affection ; that she therefore took advantage of the absence of her husband, who had gone on a pilgrimage, and sent for Dermot to come to carry her off ; that upon this invitation, Dermot with a strong party went into Brefsny, where he met Dervorgilla, and carried her away with him ; but, to save the lady's credit, it was made to appear as if he forced her away against her consent. This story, as it is told, does not appear improbable ; but, if a variety of circumstances attending the case be considered, the story will, perhaps, be found very far from the truth. First, Dermot was old enough to be the father of Dervorgilla, and had actually a daughter, who was older than that lady, married to Donald O'Brien, King of Limerick, besides a number of sons, and another daughter, Eva, who was afterwards married to Strongbow. It was not therefore very likely she could have been in love with the tyrant Dermot. Secondly, her husband was so well convinced of her innocence and purity, that, after she was rescued from McMorogh, he took her home and cohabited with her until he was basely murdered in 1172, by the partisans of Hugo de Lacy, who had invited him to a friendly conference. Lastly, she was a remarkably religious woman all through her life ;

Dermott, that he should bring no more English adventurers into Ireland, and that he should be submissive to Roderick as to his chief Lord. All this Dermott bound himself by the most solemn oaths to perform. He moreover gave his own son as a hostage for the performance of this engagement. A man of Dermott's description, however, was not to be bound by oaths or promises; and therefore, upon the arrival of a fresh body of English troops, under Maurice Fitzgerald, and others, subsequently, under Raymond Le Gross and Strongbow himself, he joined with these foreigners and gave his daughter in marriage to the Earl.

Shortly after this transaction, early in the year 1170, Dermott and the English were joined by the valiant tribe of the Dalgais,* under Donald O'Brien, King of Limerick, who was married to one of Dermott's daughters, sister to Eva, the wife of Strongbow. To this act he was instigated as well by the jealousy with which he viewed the growing power of the Conatian King, as by the close family connection between him and the King of Leinster and the prime leader of the English invaders. By this new addition of strength to the Allies, the English were enabled to obtain a permanent footing in Ireland, although of no very great extent; and, by this partial conquest, the English King assumed to himself, and

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and, after her husband's death, had lived in a state of holy widowhood to the year 1193, when she died in the Abbey of Mellifont, to which she was a bountiful benefactress, having bestowed to it 60 ounces of gold, a chalice of the same metal for the high Altar, and holy furniture for nine other Altars in the same Monastery.

* Descendants of Cas, son of Conall of the swift horses, King of Munster. The Dalgais included the principal families of Thomond, of which, in latter days, the O'Brien's were the chief. They were always noted for bravery and prowess, of which many splendid examples are to be found in the History of Ireland. The chief of the M'Namara's, one of the most respectable families of which this *Dal* or tribe was composed, was the hereditary officer that always inaugurated the chief of the O'Brien family, as Sovereigns of Thomond.

transmitted to his successors, the nominal sovereignty of the whole island. But, although the country was thus nominally brought under the dominion of England, the changes produced by it in the ancient laws of the country could not be very material; for the power of the English, in Ireland, was for some centuries confined within very narrow limits; seldom extending beyond the bounds of what was called the English Pale. This District, although at all times comparatively small, was more or less expanded according as the Irish princes were more or less united or divided amongst themselves. The English colonists, on the one hand, sowing dissensions amongst the natives, taking advantage of their weakness to extend their power and their territories; and, on the other hand, the Irish again forming leagues amongst themselves to repel the strangers and circumscribe their dominions.

By these occasional agreements amongst even two or three of the bordering Irish princes, (for the nation in general never united against the British colonists) the English power was frequently reduced to the lowest ebb; so that nothing could have preserved them from total extirpation but the assistance afforded them by other Irish princes and tribes, whose friendship and protection they purchased by paying them a tribute, or *black rent*, as it was called. That this black rent was continued to be paid by the English government in Ireland to the Irish princes, for a long period, cannot be denied. For the compositions with those princes securing the payment of this Black rent are still extant; and that it continued to be paid so near to our own time as the 28th year of the reign of King Henry VIII, is proved by an act passed in the Irish Parliament of that year, prohibiting the future payment of black rent to the chiefs or princes of the Irish.

The wars between the contending parties was of the most de-

structive nature ; and often the most barbarous and detestable acts of treachery and cold blooded cruelty were committed, which, being continued for so many generations, at length created an unconquerable hatred in the hearts of each against the other. This hatred was wilfully fomented by the unwise policy adopted by the English government in those unhappy times, who made it a constant practice to pursue such measures as must tend to irritate the natives, and to reject such proposals as might be conducive to the bringing about an amicable arrangement.

That several of the Irish princes, wearied by the perpetual warfare carried on between themselves and the English colonists, were desirous of becoming peaceable subjects to the crown of England, and of being governed by the English laws, cannot be denied. Sir John Davis, Attorney General to King James the First, in his *“ Discovery of the true cause why Ireland was never entirely subdued, nor brought under obedience to the Crown of England, ”** has shown, from indubitable authority, that the Irish, “ by a petition preferred by them to the King, Anno 2^o of Edward the Thirde, desired that an act might passe, in Ireland whereby all the Irishrie might be enabled to use and enjoy the laws of England.” Sir John further shows, that this was not the only application made by the Irish for the benefit of the English laws, but that applications for that purpose were frequent ; and he gives examples of these in the 23d and 34th years of Henry VIII, when O’Donnell, in the extremity of the North, and the O’Birnes, in the south east of Ireland, desired that they might be admitted to the protection of those laws. This so just request was not complied with, and to this circumstance, Sir John attributes the principal cause of resist-

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* London edition 1747, printed from the edition in 1612, p. 115.

ance in the Irish princes to the English government, and their close adherence to their own Brehon laws. On this subject, he thus delivers his opinion: “ This then I note as a great defect in the
 “ civill policy of this kingdom, in that for the space of 350 years,
 “ at least, after the conquest, the English laws were not commu-
 “ nicated to the Irish, nor the benefit and protection thereof allowed
 “ unto them, though they earnestly desired and sought the same.
 “ For as long as they were out of the protection of the lawe, so as
 “ every Englishman might oppresse, spoyle and kill them without
 “ controulment, how was it possible they shoulde bee other than
 “ out-lawes and enemies to the crown of England?”—“ If the
 “ English magistrates would not rule them by the lawe which doth
 “ punish treason and murder and theft with death, but leave them
 “ to be ruled by their own lords and lawes, should they not em-
 “ brace their own *Brehon* lawe, which punisheth no offence but
 “ with a fine or ericke?” *

We have above seen, that, in the reign of Edward the Third, the Irish applied to be admitted to the benefit of the English laws. But so far was this reasonable request from being complied with, that, in the 36th year of the same reign, a law was passed in the parliament, then held at Kilkenny, which made it high treason for one of English blood to intermarry with the Irish, to foster one of their children, or even to stand sponsor for one of them at baptism, To use an Irish name, to speak the Irish language, or to dress in the Irish apparel or fashion, was punishable by imprisonment. In this parliament, “ It was established and commanded, that the
 “ English, in all their controversies, should be ruled and governed
 “ by the common lawe of England; and if any did submit himself

* Discovery, &c. London edition, 1747. p. 119.

“ to the *Brehon* lawe, or March lawe, he should be adjudged
 “ a traytor.”*—“ Againe it was made penall to the English to per-
 “ mit the Irish to *creaght* or graze upon their lands, to present
 “ them to Ecclesiastical benefices, to receive them into any mo-
 “ nasteries or religious houses, to entertaine any of their minstrels,
 “ rimers, or news-tellers.”†

The statute against intermarrying with the Irish was again enacted so late as the 28th year of the reign of Henry VIII, “ Whereby it is manifest,” says Sir John Davis, “ that such as had
 “ the government of Ireland under the crown of England, did in-
 “ tend to make a perpetuall separation and enmity between the
 “ English and the Irish, pretending (no doubt) that the English
 “ should, in the end, root out the Irish; which the English not be-
 “ ing able to do, did cause a perpetuall warre between the nations,
 “ which continued four hundered and odde years, and would have
 “ lasted to the world’s end, if in the end of Queen Elizabeth’s
 “ reigne the Irishry had not beene broken and conquered by the
 “ *sword*; and since the beginning of his majesties raigne, had
 “ not been protected and governed by the lawe.”‡

We have seen before, that the ancient Irish laws were not altered by the invasion of the Danes and Norwegians, and the temporary settlements they obtained in this country, in consequence of that invasion; and that, excepting some trifling changes that might have taken place by the introduction of the Christian religion, the Irish laws must have been, at the time of the English invasion, in 1169, the same as they were when they were first instituted. We may now conclude, from the brief historical sketch here given of the first establishment of the English in this country, and from the pains

* Discovery, &c. London 1747, page 212.

† Ibid. p. 213.

‡ Ibid. p. 214.

taken by the English government to prevent the intermixture of the two nations, from the time of their first entrance into the island down to the reign of James the First, that no material change had been made in the Irish laws in consequence of the settlement of the English in Ireland ; but that, whatever those laws were at the end of the reign of Queen Elizabeth, they must have been the same as they were at the time of the invasion in the reign of King Henry II. or as they were handed down from the earliest period of the Irish monarchy, allowing for some small changes arising from an improved state of civilization.

That the Irish princes, from the time of the English invasion to the commencement of the 17th century, held their respective territories, and governed their tribes according to those ancient laws established by their ancestors at a very early period, and which the English had not the power to abolish, Sir John Davis puts beyond the possibility of a doubt : he says,* “ For to give lawes unto a people, to institute magistrates and officers over them, to punish and pardon malefactours, to have the sole authority of making warre and peace, and the like, are the true marks of soveraigntie, which King Henry the Second had not in the Irish countreyes, but the Irish lords did still retain all those prerogatives to themselves.”

“ For they governed their people by the *Brehon* law, they made their owne magistrates and officers, they pardoned and punished all malefactours within their severall countries, they made warre and peace one with another, without controulment ; and this they did not onely during the raigne of King Henry the Second, but afterwards in *all times*, even until the raigne of Queen Elizabeth.”

* Discovery, &c. London 1747, p. 18.

IV. *Of the names by which the Irish laws are called.*

The ancient Irish laws are called, in the language of the country, by four different names, in the explanation of some of which some mistakes, it is submitted, have been made by modern authors. The names are as follow, viz.

I. SEANCHAS, *i. e.* SEANCHUIS, which the commentators on the laws explain by “*gach cuis shean acas gach cuis bheannas do na Seanaibh,*” “every ancient law, and every law relating to the ancients.”

II. FENECHAS, or FEINECHUIS, which the commentators derive from “*Fene*” or “*Fine-chaoi-fhios*” *i. e.* *slighidh feasa Fine na hErenn, acas feasa a cuisí fos;*” “the way of knowledge of the people of Ireland, and also of their laws.” “*Oir is ainm do Erennchaibh FENE o Fhenuis farsaidh*” “For Fine is a name of the Irish from (their ancestor) Fenius farsaidh.” The commentator further says, that some considered this word merely a variation in the spelling of the word *Seanchas* or *Seanachas*, by a Ceannfhochras or change of initials, common in ancient Irish language.*

III. DLIGHIDH BREITHEAMHUIN, *i. e.* *Judges Laws*; commonly called Brehoon, or Brehon Laws.

IV. DLIGHIDH NEIMHIDH, *i. e.* *Laws of the degrees or ranks.* This title has been by O’Flaherty, in his “*Ogygia,*” and by Doctor John Lynch, R. C. Archdeacon of Tuam, under the signature of *Gratianus Lucius*, in his “*Cambrensis Eversus,*” translated into Latin by “*Judicia Cœlestia;*” and from them the late Charles

* The Irish Scholar, who has not the means of consulting the original laws, will find the comment here referred to, which contains many curious particulars, under the word SEANCHUIS, in O’Reilly’s Irish English Dictionary.

O'Connor of Balanagar, in his valuable "Dissertations on the History of Ireland," and most others who have mentioned those laws in their writings, call them "*Celestial Judgments.*" General Vallancey, in the first volume of his "*Collectanea de Rebus Hibernicis,*" says *Breith neimead*, literally means "*the sentence of the law,*" and he gives some fanciful derivations of the word *Neimead*, which never entered into the brain of the man who first used the term. But, notwithstanding the great reputation of all those learned Antiquaries, the author of these pages submits, that they have all mistaken the meaning of the word *Neimead*. In making this assertion he is supported by the authority of the laws themselves, and of other ancient documents. Amongst the Seabright collection of MSS. now in the Library of Trinity College Dublin,* there is a passage in which the following is to be found: "*Cia Neimheadh is uaisle fil i talmain? Neimedh necla*" (*necla* for *neclasa*). Which are the superior degrees or ranks in the world? The degrees of the church. "*Cia Neimead is uaisle fil a neacl?*" "Which is the superior degree in the church? *Neimead nEasp.*" "The degree of bishop." Again, in the same Library,† we find, in the laws respecting Bees, a Flaith or Prince, designated by the title of *Uasal Neimheadh*.—"Beich tethechta gaibhte a crann Uasail *Neimheadh,*" "Fugitive Bees found in the tree of an Uasal Neimheadh." This title the commentator explains by a Flaith or Prince. Again, in the *Seanchas bheg* ‡ a very ancient code of laws, defining the rights and privileges of various ranks in society,

* Class H. No. 54, page 17.

† Class H. No. 34.

‡ An imperfect and very much defaced fragment of this Tract, is in the Library of Trinity College, Class H. 36. Another imperfect copy in class H. 54. A perfect copy in the Book of Ballimote in the Library of the R. I. Academy; and another very ancient copy in the collection of the author of these pages.

We find a distinction made between the *Saer neimead* and the *Daer neimead*. By the first is meant a *So-fhir neimead*, *i. e.* a Neimead in good or easy circumstances, a freeman; by the latter is meant, according to the commentator, a “*Do-fhir Neimead l* (*l.* a contraction for *no*) *Neimead duire l* (*. no*) *dereoire.*” A Neimead in distress or poverty, who is obliged to labour for the service of another. Upon these authorities, the author of this Essay has no hesitation in asserting, that O’Flaherty, Lynch, O’Conor, and Vallancey, and all others who have followed them in calling the “*DLIGHIDH NEIMHEADH,*” “*Judicia Cœlestia,*” “*celestial judgments,*” or “*the sentence of the law,*” have completely mistaken the meaning of the words, which should be rendered into English, “*laws of the degrees or ranks.*”

V. *Of the office of Brehon or Judge.*

From the commencement of the Irish Monarchy, down to the beginning of the seventeenth century after our Lord’s incarnation, the Irish laws were administered by officers called, in the language of the country, *Breitheamhuin* (Brehooin), in English, *Judges*, appointed for that purpose by their Monarchs, provincial Kings, and Chiefs of districts, each for his own people respectively. This office, like that of the professors of all other branches of Science or Arts, was hereditary in particular families. The M’Firbisses of Leacan were the hereditary Judges of the Tribe of the Mac Donoghs of *Tir Oliolla*, and some other septs in the North of Conaght; the Mac Clanchys filled the judicial chair of Thomond (*Tuath Mumhan, Thooa-Moowan*), or North Munster; the

O'Breisleans were hereditary Judges to the Maguires, and other septa inhabiting Fermanagh, and a part of *Oirgiall* or Oriell; and the Mac Egans * held a similar office under some of the Dalgais,† the O'Kenedys of Ormond (*Oir Mumhan*, Oir Moowan) or East Munster, the O'Reillys, Princes of East Brefney, and many other distinguished families.

Whenever the Judge sat in execution of his office, he was constantly attended by a *Filé* or Bard, who was well skilled in the *Dlighe Filidheachta* (*Dlee-he Fillee-aghta*) or Poetic Law, *i. e.* that part of the law, the rules of which were preserved in poetry or verse. The duty of the *File* was, if called upon for that purpose, to assist the memory of the *Breitheamh* (*Breih-av*) or judge, by a repetition of portions of the laws, bearing on the question then under consideration, and to supply examples of the proceedings and decisions of former celebrated judges in similar cases. To qualify the *Filé* for this important office, the rules for the education of the poetic professors required that every *Dos*, or poet of the third degree, before he was qualified to become a *Cana*, or poet of the fourth degree, should repeat, in the presence of the king and the nobles, the *Breithe Neimhidh*, *i. e.* the law of the degrees or ranks, and fifty poems of his own composition.

Doctor Nicholson, in his "Irish Historical Library," says, "Those "grave sages of the law who compiled ours" (the Irish law) "were a distinct tribe or family (as the historians, physicians, poets, "and harpers) to which was allotted a sufficient farm in inherit-

* To this last mentioned race of Brehons we are indebted for the major part of the copies of Ancient Irish Laws that are now extant. There is scarcely one Law-tract in the Library of Trinity College that the name of M'Egan does not appear in, either as the commentator, transcriber, or proprietor.

† See Note, page, 159.

“ance; and, in criminal cases, the Brehon had an eleventh part of all the fines.” Other authors have also asserted, that the Judge received the eleventh part of all fines imposed by his decisions. But upon the most diligent search, which the author of this Essay could make, through the ancient laws of his country, he has not been able to discover any thing that justifies the assertion. On the contrary, he has reason to think, that the Judge did not receive any part of the fines imposed, as every care was taken to make him an independant and disinterested agent. In the *Seanchas bheg*, which particularly provides for the entertainment and rewards, and defines the rights and privileges of various ranks in the state, no mention is made of fines to be paid to the *Brehons* or judges, although in that treatise we find established the following provision for the support of those officers:—“*Brethemh Berla Fene acas Filedheachta X. Seoit ina dire acas turtugad cuigti acas trica bairgin do.*” “The Breiheav (Judge) of the *Bearla Fene* (*i. e.* of the common law, and of the poetic law, his *dire* (dues) are ten *Seoids* (Cows) and full entertainment of meat, &c. for five days, and thirty cakes daily.”—“*Breithem tri mberla comdire do fri hoire tuisi.*” The Breiheav (Judge) of three* *Bearla* (laws) his *dire* (dues) are equal to those of an “Aire † Tuisi.”

To secure the impartial administration of justice, the law declares, that the rank of Brehon should not be given to any, who had not

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* “Three *Bearla*.” The commentator explains this by “*Fenechas, Filidheacht acas Leighinn.*” The common law, the poetic law, and the written law.

† By the Treatise here quoted, it appears that the *Aire Tuisi* was the lowest but two in the degrees of Princes or *Flaiths* called *Airechs*, the *Aire echda* and *Aire desa* only being inferior to him. His *Diré* was fifteen *séds* (cows); his full entertainment of meat, &c. was for ten days, and forty cakes daily. The commentator describes the quality of the cakes which each person was to receive.

Tellach (a household, possessions, &c.), and who paid not the legal retribution to the *Brughaidh* * (*Broo-ee*), and also for the trespasses of his cattle, or for the waste and offences committed by his people. If a Judge were convicted of partiality, or having wilfully pronounced an unjust decision, he was stigmatized with a welt or mark branded on his cheeks, as may be inferred from the following extract from the ancient Glossary of Cormac Mac Cuillionan, under the word FERB. “*Ferb dan. i. bolg do cuirther for gruadh- aibh in duine iar nair, no iar ngubreith.*” Ferb, moreover, is a blister (welt or seam) inflicted on the cheeks of a man after contemptuous abuse, or after a *false decision*. Again, in a Law-tract in the College Library, which the late General Vallancy mistranslated and published, † we find the following; “*Bearthaidh Sencha cetbrethach bantellach ar fertellach comdar Ferba fulachta for a ghruaidhe iar cillbreathach.*” “Sencha gave the first decision, that female property was equal to male property; so that he suffered a brand on his cheek, after his unjust judgment.”

That the Brehons had lands assigned to them for their support is attested by Camden, in whose days they were in full employment in Ireland. “The Irish,” says he, “have their Judges, and they always have successors, to each of whom a farm is assigned” ‡

* The *Brughaidh* (*Broo-ee*) was a public officer to whom lands were assigned, for the purpose of keeping an open house of entertainment for the reception of strangers, and supplying the poor with food, &c. The house of the *Brughaidh* was the place of general assembly for the heads of the Tribe, and here they generally elected or confirmed the elections of their chief.—*Brughaidh* was also the title of a public farmer.

† Collect. de Reb. Hib. Vol. 3. p. 84.

‡ Britan. Amstel. edit. p. 686.

VI. *Account of ancient Brehons and Lawgivers.*

The ancient Irish manuscripts preserve to us the names of several noted Lawgivers and Judges, besides those given by O'Flaherty in "Ogygia," who is followed by O'Conor in his "Dissertations on the History of Ireland." Some of those were co-eval with the settlement of the Celto-Iberian colony in Ireland, others lived between that period and the introduction of Christianity, and others subsequent to that event. Some of the laws of those persons are still extant; but it is to be lamented, that the greater portion is irrecoverably lost. This is not much to be wondered at, when we recollect, that it was the barbarous practice of the Danes to plunder and burn the Colleges and other seminaries for the education of youth, and to destroy the books wherever their power extended. A policy in which, to the eternal disgrace of the English government in Ireland, they were too closely imitated by the English colonists in this country, down to the reign of King James the First, and perhaps even later.

Upon the landing of the Milesian colony in Ireland, we find them accompanied by Amergin, brother to Heber and Heremon, the first Ibero-Celtic Monarchs. Amergin was the Brehon of the colony, and was also a poet and a philosopher. Four poems, the productions of this author, are mentioned in the Transactions of the Ibero-Celtic Society as being still extant.

Eochaidh Eadgadhach (Eohy Eadgahagh) the 27th Monarch of Ireland, we find by the Leabhar Gabhala (Leaver Gavaula), first established the law, by which the different ranks in society were to be distinguished by the number of colours in their respective garments. This Monarch, according to O'Flaherty's chronological calculation, commenced his reign, A. M. 3041.

Ollamh Fodhla (Ollav folla) the 40th Monarch of Ireland, ascended the throne A. M. 3236. He established the celebrated *Fes*, or assembly of the States, at Tara, for several purposes beneficial to the nation. He is generally considered as the great Lawgiver of the Irish, although none of those laws supposed to be made by him in particular have descended to our times. But though he might have promulgated some salutary laws, he was, most certainly, not the first lawgiver of the Irish; as is evident from the quotation from the *Leabhar Gabhala*, given above, page 145, which shows that one of the principal causes, that induced the people to elect him their Sovereign was, “*that he might preserve the laws and regulations already established.*”

Ugaine Mór, or Hugony the Great, became the 78th Monarch of Ireland A. M. 3619. He divided the island into twenty-five parts, or shares, over each of which he placed one of his sons as superintendant, and ordained laws for their government. One of these sons, Roigné Rosgadhach, or Royney the poetic, is said to have been the author of some of those laws called *Dlighe Neimhidh* (*Dlee-he Nevee*), or laws of the degrees; but we are not now able to state which of those laws, bearing that name, were of his composition.

About A. M. 3900, flourished Eochaidh (Eohy) son of Luchtua King of Munster, who promulgated some laws highly praised for their strict justice. Where any part of those laws are now to be found the writer of this Essay has not been able to discover.

About this time, also, lived the noted Brehon, Eogan, son of Darthacht (Darhaght). He is said to have composed laws; but these, like most others of the same and even of subsequent periods, it is much to be feared, are no longer in existence.

Eochaidh Feidhleoch (Eohy Feylogh,) 104th Monarch of Ire-

land, ascended the throne A. M. 3922. He made some alterations in the laws, and restored the pentarchical government which Hugony the Great had abolished. In his time flourished Sean, son of Agaidh (Agay) the reputed author of a code of laws called "FONN SEANCHAS MOR." Three copies of a tract, bearing that name, are to be found in the MSS. in the Library of Trinity College. H. No. 35, page 11. H. 54, page 10, and H. 54, page 358. By a memorandum prefixed to the first of these copies, it is said to have been compiled by Sean, the son of Agaid, in the time that Fergus, son of Leid was King of Ulster, twenty-six years before our Lord's Incarnation. By some introductory matter prefixed to the second copy, it is said to have been compiled in the time of Laoghair, son of Niall, the first Christian Monarch of Ireland, who commenced his reign A. D. 429. The persons who were concerned in this compilation were the famous committee of nine, mentioned above at page 153, who were specially appointed for that purpose. The third copy seems to be nearly the same as the second, and both differ from the first, at least in the arrangement of the laws, though in some respects the laws agree in substance. Perhaps the first tract may be the same as that composed by Sean, and the others, copies of that work as revised and altered by the committee. Each of these copies appears to be more or less imperfect; but still they contain laws on a great variety of subjects, well deserving of publication, as affording matter illustrative of the manners and customs, not only of the ancient Irish, but also of other Celtic tribes, and interesting in a peculiar manner to the British nation.

About the time of our Saviour's nativity, whilst Conor, son of Nessa, the Mæcenas of Ireland, ruled the province of Ulster, flourished the poets Adhna (Ahna) Athairne (Ahairne) of Binn-

Edair, Forcheirn, or Ferceirtne, son of Deaghaidh (Deaghy) and Neide, Son of Adhna, all of whom, it is said, composed *Dlighidh Neimhidh*, some fragments of which are said to be still in existence. What was the nature of the laws, said to have been communicated by those poets, we are not told ; but it is most probable, that they were for the regulation of the Bardic tribe, who at that time generally executed the office of Brehon, and who had rendered themselves so odious to the people by their insolence, their oppressions, and arbitrary decisions, regardless of justice and contrary to the established laws of the land, that they were expelled from the provinces of Leinster and Munster. In this exiled and wretched condition, they sought protection from the Ulster King, who, though guilty of numerous faults, was a powerful prince, and the constant and bountiful patron of genius and learning. Conor received them into his protection ; but knowing, that a reformation in their order was absolutely necessary, as well on their own account, as to satisfy the people of the other provinces, he determined upon reducing their assumed power, and subjecting them to proper restrictions. This he performed by the aid of some of the Bards themselves, amongst whom the persons above mentioned were the most celebrated ; and, by these means, he brought about the reestablishment of the order in the other provinces under the necessary limitations. From these circumstances we may be allowed to conclude, that the laws, said to be composed by these persons, were for the regulation of ranks in society, of which the poets were one of great importance. If this conclusion be correct, the title of *Dlighidh Neimhidh*, or laws of degrees given to their compositions was appropriate, and it is not improbable that they are now em-

bodied in the *Seanchas* bheg* ; which, though certainly composed in times subsequent to the establishment of the Christian religion in Ireland, carries internal marks of very high antiquity.

In the latter end of the first Christian century, lived the celebrated Moran, chief Judge to the Monarch Fearadhach Fionnfachtnach (Farayagh Finnfhaghtnagh), *i. e.* the fair and just. Moran, under the auspices of his “ fair and just” Monarch, is said to have formed some laws for the better government of the people. What these laws were, the writer of this Essay cannot say ; but, if they were framed on the principles recommended to his master in his *Udhacht* † (*Oo-aght*) or testamentary precepts, they must be truly just ; and truly happy must that people have been, who had a Fearadhach to govern them, and a Moran to administer justice.

In the time that Conn *of the hundred battles* reigned over Ireland (A. D. 177,) lived Modan, son of Tulban, who wrote a law-treatise called *Meill bhreatha*. A copy of this tract was in the possession of the celebrated Duaid Mac Firbis, the last of the Antiquaries of Leacan, who was murdered at Dunflin, in the county of Sligo, A. D. 1670.

About the year 200, lived Fachtna, son of Seancha, whose laws are quoted in the *Sanasan*, or Glossary of Cormac Mac Cuillionan, King of Munster, and Archbishop of Cashel ; and, about the same period, lived Conla, Judge of Conaght, Kinnith O’Conmid, and some others, of whom the writer of these pages acknowledges that he knows little more than the name.

In the year 254 of the Christian æra, Cormac Mac Art, or, as he is by others called Cormac O’Cuinn, ascended the throne of Ireland. Besides several other tracts, he wrote a Treatise on

Crimes, &c. a copy of which is to be found in the Library of Trinity College. * At this time also lived Cairbre, the son of Cormac, Fionn † Mac Cubhail (Finn mac Coo-al) and Fithil, chief Judge of Ireland. All these are said to have delivered laws ; but they are at present, perhaps, not extant, with the exception of those of Fithil, some fragments of which are now in the Library of our University.

Contemporary with Cormac Mac Art lived also Fiatach (Fee-a-tagh) a lawgiver, who wrote a law-tract, called Fiondsuith, a copy of which was in the possession of Duaid Mac Firbis of Leacan. ‡

We have seen above, p. p. 153 and 173, that in the reign of Laoghair (Lay-a-rey) Monarch of Ireland A. D. 429, the ancient laws, records, &c. of the nation, underwent a thorough revisal by a committee of nine persons, appointed for that purpose. One of these was St. Beinín or Benignus, who for ten years filled the Archiepiscopal chair of Armagh, and died the 9th of November, 468. This eminent man, beside the share he had in the revisal of the *Seanchas mor*, is said to have been the author of the *Leabhar na cceart* (Leavar na garth) or “ *Book of Rights*, § setting forth the rights, privileges, and revenues of the monarchs of Ireland, and those of the provincial kings. Copies of this book are in the Library of Trinity College, in that of the Royal Irish Academy, and in private collections ; but the language is apparently more modern than that used in the days of St. Beinín. But, be that as it may, the revenues of the Monarchs, provincial Kings, and petty Princes,

* Class H. No. 54.

† The Fingal of M'Pherson's Ossian.

‡ Cambrensis Eversus, cap. 20. p. 157 et. seq.

§ For an account of this work, see *Transactions of the Ibero-Celtic Society*, page 28.

were paid according to the mode and quantities prescribed by that document.

In the time that Guaire (Gwoo-ary) the generous, ruled the Province of Conaght (A. D. 647) lived Seanchan Torpest, who is said to have composed some laws; but, though some copies of poems written by him are to be found in the book of Glendalough, in the Library of Trinity College, * and in the book of Leacan, in the Library of the Royal Irish Academy, copies of his laws are yet to be discovered.

In the year 678, died Cinnfaeladh (Kinfayaladh) the learned. Besides the Uraicept and several poems, of which he was the author, he revised the Treatise on Crimes, &c. written by the Monarch, Cormac, and subjoined some additional matter of his own. This appears from the MSS. in the Library of Trinity College, † where it is stated, that the parts written by Cormac are those beginning “ *A meic ara fesar*” and the “ *Blai*,” and that the subsequent parts were written by Cinnfaeladh. The article in which this tract is contained has been misplaced by the binder in making up the book. The beginning of the tract is at page 409, of class H. 54, and continues to the end of page 412, where it breaks off apparently imperfect; but the continuation is to be found at page 399, and so forward to page 408, where it ends imperfectly, not having Cinnfaeladh’s additions. Another copy of this tract is in the MS. collection of the writer of this Essay; but he has to regret that his copy, though fuller than the College copy, is also imperfect. General Vallancey, in the latter end of the first volume of the *Collectanea de Rebus Hibernicis*, has given some account of this tract; but he has fallen into some gross blunders, which Doctor ‡ Camp-

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* Class H. No. 32.

† H. 54.

‡ *Strictures on the Ecclesiastical and Literary History of Ireland*, p. 46.

bell taking advantage of, has used as a medium to turn the whole into ridicule.

During the time that Finghin (Fineen) son of *Cu cen-mathair*, was king of Munster (A. D. 996), flourished a lawgiver named Amergin, son of Amalgaid, author of a law-tract on the privileges and punishments of various persons. This tract is to be found in the College Library, H. No. 54.

In the time of Cathal, son of the above-named Finghin, King of Munster, who died A. D. 742, flourished the three O'Burechans, brothers, named Farann, Baethgal and Maeltuile, one a Bishop, one a Judge, and the other a Bard. They were joint authors of some laws, which are, probably, intermixed with other manuscripts in the Library of our University.

Contemporary with these brothers was Cearmnadh (Kearmna) the poet, author of a law-tract, to be found in the Library of Trinity College, class H. No. 54, page 469.

This is the last Irish lawgiver we find mentioned before the Danish invasion, and with him we may close this catalogue.

VII. *Account of ancient Law-tracts that were in the possession of the celebrated Duaid M'Firbis.*

So late as the latter end of the 17th century, there was in existence a number of ancient law-tracts, which, it is much to be feared, are not now to be found. At that period Duaid M'Firbis, the last of the hereditary Antiquaries of Leacan, already mentioned, had in his possession a collection of ancient Irish laws, a catalogue of which he transmitted to the erudite author of *Cambrensis Eversus*.*

* *Cambrensis Eversus*. Cap. 20. p. 157. et seq.

This catalogue, the late learned Charles O'Connor of Belanagar, published in his valuable "Dissertations on the History of Ireland." The first collection, we are told, was entitled *Breithe Neimhe*, compiled from the works of ancient *Fileas*, by the three sons of Burechan; but we are not informed what was the nature of their contents. Another collection contained the following tracts:

I. *Meill-bhreatha* (*Mell vreaħa*) *i. e.* a collection or mass of judgments, written by Modan, son of Tulban.

II. *Fiond suith* (*fionn see*), *i. e.* the establishment of truth, written by Fiatach, in the time of the Monarch Cormac, son of Art.

III. *An teacht Bhreath*, *i. e.* the legal decisions, a miscellany of laws.

IV. *An Fuigheal Bhreatha* (*an foo-ee-yal vreaħa*), *i. e.* the verbal decisions. To this is subjoined a tract intitled *Fotha mor*, *i. e.* the great foundation, setting forth the office of a Judge, and the faults which subject him to be deprived of his office.

V. *Fotha bheag* (*Foha veg*) *i. e.* the small foundation. On the laws of partition.

VI. *Aid bhreatha* (*aid vreaħa*) *i. e.* judgments on theft or larceny. This would be more properly written *Tuid Bhreatha*.

VII. *Coras fine*, *i. e.* the regulations of a tribe. Mr. O'Connor, calls this "a book, prescribing rules for the tanist districts." Not having the book here mentioned, the writer of these pages cannot speak of its contents; but he knows, that, in the Library of Trinity College, * is to be found a law-tract, bearing the same title, which treats of agreements between the different members of a tribe, and of the disposal and gavelling of land and other property.

* Class H. No. 54. p. 214.

VIII. The book of *Cain* (Cauin) or *Mulcts*, divided into four parts. The first relates to mulcts of all kinds ; the second to murders and several other crimes, with the punishments annexed ; the third to securities, pawns and forfeits ; the fourth, witnesses and testimonies. This work was perfected at Cashel, under the patronage of Felim, son of Crimbthan (Criv-an) King of Munster. To this work is added, by way of Appendix, *Eidgheadh*, a book treating of crimes against the laws, written by Cormac, son of Art, and his son Cairbre Liffeachar, both Monarchs of Ireland.

IX. A work intituled *Dula*, consisting of three parts, of which Mr. O'Connor gives the following account :—" The first treats of
 " political subjection, and the measures of obedience to our kings ;
 " of wardships, patronages and privileged places ; of the punish-
 " ments of offenders in the case of blood ; and of the forms wherein
 " pacts, contracts, and treaties should be reduced to writing. The
 " Monarch Cormac assisted in digesting this work."—" The second
 " part is a miscellaneous treatise relating partly to ecclesiastical mat-
 " ters. It was compiled by *Comin foda*, but the time uncertain.* Ano-

* St. Comin foda, or Cumin fada, and the period in which he lived, are facts as well known as any in Irish history. He was the son of Fiachna, King of West Munster, was born in 592, and died, according to the annals of Tighernach, in 662. In the *Felire Aenguis*, or Festivals of the Church, written by Aengus Ceile De, in the latter end of the 8th century, a copy of which is in the *Leabhar breac* in the Library of the Royal Irish Academy, we are told, that, while other holy men received one gift or another from the Almighty, Cumin-fada received that of science and wisdom. He took a very active part in the controversy respecting the time for observing the Paschal Festival, in which he was one of the chief supporters of the Roman mode of computation, and greatly promoted its adoption in the southern parts of Ireland. It is worthy of remark, that, in his Paschal Epistle to Segienus, Abbot of Hy, he refers to the Cycle, which he says " St. Patrick our Pope brought with him," " Primum illum, quem Sanctus Particius Papa noster tulit." And, although Doctor Ledwich must have been well acquainted with this fact, yet in page 62, of the 2d edition of his *Antiquities*, he mentions the silence of Cumman respecting St. Patrick, as a proof that Patrick was an

“ ther tract relates to rights and regulations, by sea and land, and
 “ was drawn up by Cormac and Cairbry Liffecar. The last pre-
 “ scribes what honors are to be paid to kings, ecclesiastics, fileas, &c.
 “ It is said to be taken mostly from Royney Rosgadhach, son of
 “ Hugony the Great.”

Perhaps the tract here mentioned might have been the *Dul-Rosgadhach* so frequently quoted in Cormac's Glossary.

X. *Cain Fuithribhe* is the title of another code, which treats of the laws of prescription and long possession. It was written in the 8th century, under the inspection of Cathal Mac Finghinne, King of Munster.

XI. *Fonn Sheanchais mhoir*. Mr. O'Connor says, “ it is mentioned in the annals of the four Masters, and the loss of it is “ irreparable.” We have seen above, page 34, that this code is to be found in different MSS. in the Library of Trinity College.

XII. *Cain Drubhartaigh Bearra*, treated chiefly of maritime and commercial affairs, and was composed about the same time with the *Seanchas mhor*.

XIII. *Cain Lanamhna mhoir* and *Cain Lanamhna bheg*. “ This,” says Mr. O'Connor, “ shewed the several relations of society.” This may be doubted. A section of a law-tract of the same name is to be found in the Library * of the University, which, agreeable to its title, treats of marriage, adultery, fornication, &c.

XIV. *Faidh 'Feneachais*, a miscellany of all laws. There is

ideal person. His epistle to Segienus was pulished by Archbishop Usher in 1632, in his Sylloge. Ep. Hibern. In the *Liber hymni*, amongst the MSS. in the Library of Trinity College, is a hymn written by Cumin fada, beginning “ Celebra Justa Festa Christi Gaudia,” and he is also supposed to be the author of the Treatise “ *De pœnitentiarum mensura*,” an abridgment of the ancient penitential canons, published in the Bibliotheca Patrum. Tom. 12. Lyons 1677,

* Class H No. 34.

probably an error in this title. It is most likely, that it should be written *Taidh Fenechas*, *i. e.* the ancient law on theft or larceny.

XV. *Cain Borachta*, a tract relating to property in herbage, herds, flocks, &c.

Of the works of the authors mentioned in the former section, it is to be feared, that the greater part is now irrecoverably lost. This, notwithstanding the great care at all times taken by the Irish of their ancient laws and records, will not be much wondered at, when it is considered, that the Danes and Norwegians, wherever their power extended, proved themselves the determined enemies of literature, by plundering the schools and colleges, burning and destroying the books, and murdering the professors and students. A barbarous policy, in which they were too closely followed by the English, from their first invasion of Ireland down to at least the reign of James the First, if not to the time of Cromwell. Add to this, that, when the clergy and monks (in whose libraries copies of those important national documents were always religiously preserved) were obliged to fly from the land of their forefathers, to escape from the persecutions waged against them by the ruling powers, they carried with them to the continent, where they found an asylum, as much of their property, including their books, as they could secure from the gripe of rapacity. Even the law-tracts mentioned in the foregoing catalogue, which, not much above 150 years ago, were in the hands of Duald M'Firbis, are no longer forthcoming. It is true Mr. O'Conor, in his preface to "*Ogygia vindicated*," page 9, speaking of Mr. M'Firbis, says, "His historical, typographical, and genealogical collections (written by his own hand) are now in the possession of a worthy nobleman, the Earl of Roden, who added this to the other collections of Irish manuscripts made by his Father, our late Lord Chancellor Jocelyn." Amongst these, his

law-tracts, although not mentioned by Mr. O'Connor, may, perhaps, be preserved. But, if they be, still are they not a locked-up treasure, and the same as lost to the public? If they be still preserved in the library of the present Earl, his Lordship has the power of rendering an essential service to the native antiquary, and to the lovers of ancient Celtic literature in general, by depositing them in the Library of St. Sepulchre, or some other public library, where the Irish scholar may have unrestrained permission to read them, and, if he should be so inclined, an opportunity of communicating to the public a knowledge of their contents.

VIII. *Of ERIC, and other modes of punishment prescribed by the Irish laws; of the nature of those laws, and of their influence on the habits and morals of the people.*

It has been a practice of long continuance with writers of a certain description, from the lying Giraldus Cambrensis down to the little less fabulous Doctor Ledwich, to decry the ancient Irish laws; and to complain, that the adoption of them by the English colonists caused the most deplorable degeneracy, and that they were of so malignant a nature as to entirely brutalize the Irish character, and to encourage the perpetuation of crimes the most horrible and appalling. It is however worthy of remark, that the persons most forward in the condemnation of those laws are generally those who, from their total ignorance of the Irish language, (in the *Fenian* dialect, of which those laws are written) are utterly disqualified from delivering any correct opinion on the subject. Gerald Barry, a Welshman, better known by the name of *Giraldus Cambrensis*,

was the first who described the Irish as a lawless race. For a complete exposure of the falsehoods, misrepresentations, and malice of this notoriously fabulous writer, the reader is referred to the Cambrensis Eversus of the learned Doctor * John Lynch, Roman Catholic Archdeacon of Tuam. In that valuable work, the author has shewn, that the slanders of Cambrensis were wilful falsehoods, invented by him, who had the means of knowing the truth, having had the perusal of a great number of the old Irish annals, which he maliciously destroyed.

Edmund Spenser, who, in 1596, published "A View of the State of Ireland," says the Brehon Law "is a rule of right unwritten, but delivered by tradition from one to another, in which oftentimes there appeareth great share of equity, in determining the right between party and party, but in many things repugning quite both to God's law and man's: as, for example, in the case of murder, the Brehon, that is, their Judge, will compound between the murderer and the friends of the party murdered, which prosecute the action, that the malefactor shall give unto them, or to the childe, or wife of him that is slaine, a recompense, which they call an Eriach; by which vilde law of theirs, many murders amongst them are made up and smothered. And this judge being, as he is called, the Lord's Brehon, adjudgeth for the most part a better share unto his Lord, that is the Lord of the soyle, or head of the sept, and also unto himselfe for his judgement, a greater portion, then unto the plaintiffes or parties grieved." Had

* Doctor Nicholson, Bishop of Derry, calls this gentleman "the judicious Mr. John Lynch," and gives him the following character: "The collector was a person of that accuracy of skill, (and niceness of taste) in the histories of Ireland, that the reader may rest assured, that his calculations are exact; and that no matters of any great moment have escaped his notice." Irish Hist. Lib. App. p. 244.

Spencer, who lived at a time when the Brehon law was in full force in every part of Ireland, except those included within the compass of the English pale, made the proper enquiries to inform himself upon the subject of ancient Irish law, he would have found that it was not "a rule of right unwritten," but a law written many centuries before statute law was known in his native country; and, if his reading had been more extensive, he would have known, that the practice he condemns as barbarous in the Irish had been the practice of many ancient nations, and sanctioned by the laws of his own country. "For," says Blackstone,* "we find in our Saxon laws, particularly those of Athelstan, the several *Weregilds*, or compensations for homicide, established in progressive order from the peasant up to that of the King himself. This was a custom derived to us, in common with other northern countries, from our ancestors the ancient Germans." But Spencer was a poet, and as people of that description are more fond of dealing in fiction than in fact, he denied the existence of the Irish written law; and, as it was the fashion of the day to decry and debase the Irish character, he selected as a fair sample of the entire code of Irish laws, the mode of punishing the crime of murder, which he conceived would be considered by his readers as barbarous and unjust. He acknowledges indeed, that, in the legal proceedings of the Irish, "oftentimes there appeareth great shew of equity;" but he mistakes a fact, blending truth with falsehood. It is true the Irish law did generally impose an *Eric*, or fine, as a punishment for the crime of murder; but there were cases, in which that crime was punished with death, and in all cases the murderer was subject to many grievous

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* Commentaries, Book 4, page 23.

pains and penalties beside the payment of an *Eric*. If the murderer fled, or was not given up to justice, or had not the means of paying his *Eric*, it was to be levied from the tribe to which he belonged. For it was the policy of the Irish law, that the whole tribe should be accountable for the crimes of each of its individual members; thereby rendering every man an interested conservator of the public peace. The law provided for the distribution of the fine, when paid, amongst certain persons of the tribe to which the deceased belonged; of which the wife or child of the deceased received the greater part, and the *ceann fine*, or head of the tribe, also received a considerable proportion. This was but reasonable; because the chief had lost the services of the deceased, and was obliged to provide for the necessities of all the members of his tribe, in which were included the wife and children of the person murdered. That the judge was not allowed to allot to himself "a greater portion of the fine than unto the plaintiffes or parties grieved," nor indeed any portion at all, may be concluded from the silence on this subject of the code of laws called *Seanchus bheg*; where, as we have seen above at page 169, the rights, privileges and rewards of the Brehons were particularly defined.

But, supposing the Irish custom of punishing culprits by the imposition of a pecuniary mulct were as barbarous as Spencer and others would wish to make it appear, it was surely not more barbarous amongst the Irish than it was amongst several other nations; and, amongst the rest, Spencer's own countrymen, who punished the crime of murder by a fine on the murderer.

That the ancient Greeks satisfied by a fine for the crime of murder appears from more than one passage in Homer.

————— “ If a brother bleed,
 “ On just atonement we remit the deed ;
 “ A sire the slaughter of his son forgives,
 “ The *price* of blood discharged, the murd’rer lives.”*

Again, describing the shield of Achilles, he says,

“ There in the forum swarm a numerous train,
 “ The subject of debate, a townsman slain ;
 “ One pleads the *fine* discharged, which one denied,
 “ And bade the public and the laws decide.”†

We are informed by Tacitus, that, amongst the Germans, “ he who is convicted of transgressions pays a mulct of horses, or of cattle. Part of that fine goes to the king, or the community, and part to the person injured, or to his family. Atonement is made for homicide by a certain number of cattle, and by that satisfaction, the whole family is appeased : a happy regulation, than which nothing can be more conducive to the public interest, since it serves to curb that spirit of revenge which is the natural result of liberty in the excess. ‡”

By the Salic law, it appears “ that any freeborn man who had killed a Frank, or a Barbarian, or any other person who lived, according to the Salic law, was to pay 200 gold sols or pence, by way of fine. That 300 pence was the fine for killing a Roman, who may be qualified to sit at the king’s table. Whoever shall be convicted for the murder of a Roman, who is a man of independent property, shall be obliged to pay a fine of 100 gold pence. Whoever has killed a tributary subject, who was a Roman, shall be liable to the fine of 45 gold pence.” §

* Pope’s Translation of the Iliad, Book 9, v. 743.

† Ib. Book 18. v. 577.

‡ Tacitus de Morib. Germ. XII. et XXI.

§ Leg. Sal. Tit. 44.

Again, in another place, the same law provides, that “ who-
 “ ever has killed a chief baron, or an earl or graff, who had been
 “ one of the king’s household, shall be condemned to pay a fine of
 “ 300 gold pence.*

The law of the Ripuarians, another tribe of the Franks, in like manner decides, that, “ if a freeborn man has killed a Ripuarian
 “ citizen, he is to be condemned to the payment of 200 gold sols or
 “ pence.”†

In like manner, “ if a Ripuarian kills a Salian Frank, he must
 “ pay 200 gold pence. The sum of 160 gold pence must be paid
 “ for killing an Alleman or German, a Frisian, a Bavarian, a
 “ Saxon, &c. If he has killed a Burgundian, he shall be, in like
 “ manner, fined in 160 such pence. If he has killed a Roman,
 “ who is not a subject of the Ripuarian king, he shall pay a fine of
 “ 100 gold pence.”‡

The ancient Frisones, in like manner, punished murder by a fine. The laws of that people, in the compilation of Lindembroc, decree, that, “ if a nobleman hath killed another noble, he shall pay
 “ 80 gold sols or pence; but, if hath killed a simple citizen, he must
 “ pay only 54 gold sols and one denier. The noble that kills a
 “ franked servant, shall pay 27 gold pence, wanting one denier,
 “ to his master, and nine pence to his nearest relations. A citizen
 “ who had killed a nobleman was to be fined 80 gold sols; and only
 “ 53 and one denier, if he kill another citizen of the same rank
 “ with himself. If a freed servant has killed a nobleman, he shall
 “ pay 80 gold sols; and only 53 and one denier for killing a simple
 “ citizen.”

By the laws of Athelstan, king of the West Saxons from the year 924 to 940, all sorts of homicide, and even parricide, were

* Leg. Sal. Tit 57. pars secunda.

† Lex Ripuar Tit. 7.

‡ Ibid. Tit 36.

punished by a fine or mulct. “ Whoever killed an archbishop or a duke was fined no more than 15,000 thrysmas or groats, (about £250. sterling.) The parricide of a bishop and the killing of an earl was taxed at only 8,000 groats. A viscount’s life was compensated by half that sum. The blood of a baron was estimated at 2000 groats, which was also the fine and only punishment for murdering a simple priest. Whoever killed any other plain man, within the twelve days of Christmas, on the Sundays of Easter and Pentecost, on Ascension Thursday, or on the festivals of the Purification, Assumption and Nativity of the Blessed Virgin Mary, or on the day of All Saints, was punished with a fine of 40 shillings. Rape, robbery, and theft, were also punished with 40 shillings fine.”*

In the laws of William the Conqueror (being the same, as the title imports, which Edward the Confessor observed before him), we find the following :

“ If one man kills another, and confesses it, yet refuses to pay the usual compensation, there shall be given out of his manbote to the lord, for a freeman ten shillings, and for a villain twenty shillings.—The *were* of a Thane in the Mercian and West Saxon laws is twenty pounds, and by the same laws the *were* of a villain is one hundred shillings.”

“ As to the *were*; for one who was of noble extraction, let there be paid to the widow and orphans X^s. and let the orphans and the kindred divide the remainder between them.”†

“ Where a Frenchman is killed, and the men of the hundred do not apprehend the murderer and bring him to justice within eight days, so as that it may appear who committed the murder, they shall pay in the name of murder 47 marks.”‡

* Leg. Athelst. Reg. *de diversis occisorum sanguinis pretiis*.

† Laws of William the Conqueror, published by Kelham, p. p. 25, 27.

‡ Ibid, page 47.

See more on this subject in the Welsh laws of Hywell Dha, and in Wilkin's *Leges Anglo-Saxonicae*.

Sir John Davis, Attorney General of Ireland in the reign of James the First, has been even more severe than Spencer in his condemnation of the Irish, for their practice of punishing the crime of murder by an *Eric*, or fine. In his "*Discovery of the true cause why Ireland was never entirely brought under obedience to the crown of England*,"* he says, "For, if we consider the nature of the Irish custome, we shall finde, that the people which doth use them, must of necessitie be rebelles to all good government, destroy the Commonwealth wherein they live, and bring barbarism and desolation upon the richest and most fruitful land of the world. For, whereas by the just and honourable law of England, and by the laws of all other well-governed kingdomes and commonweals, murder, manslaughter, rape, robbery, and theft, are punished with death, by the Irish custome, or *Brehon lawe*, the highest of these offences was punished only by a fine, which they call an *Ericke*."—Here the learned Attorney General makes a great display of his extensive knowledge of the "honorable laws of England,—and of all other well-governed kingdomes and commonweals," yet he has not the justice and impartiality (though very estimable qualities in an Attorney General) to acknowledge, that the custom he condemns in the Irish had been constantly practised in his own country, and in several other nations not devoid of civilization.

If Sir John Davis had taken the pains to enquire fully into this subject, and had the candor to confess the truth, which he must have discovered from such enquiry, he would have given a picture

* London edition 1747, printed from the edition of 1612. p. 167.

of the Irish laws widely different from what he has done. He would have discovered and acknowledged, that, by the Brehon laws, the crime of murder was not punished by an Eric, or fine only. He would have found that there were cases, in which the punishment of homicide, rape, and other offences of great magnitude, was death; and that in all cases the person convicted of murder, beside paying, either by himself or tribe, the prescribed Eric, was also deprived of his inheritance, and of all the rights, privileges, and immunities, to which he would be otherwise entitled amongst his tribe, or through the nation in general. He would also have found, that no place of sanctuary could afford protection to a murderer who had fled from punishment; but that every noble or privileged person, whether lay or ecclesiastical, with whom he might seek refuge, was obliged by the laws to surrender him to justice. Davis could have no excuse for not making the enquiry; the way to information was open before him; in his time the Brehon law was in full force, all through the nation, except within the English pale; and the Brehons or Judges were well known, and might be consulted. Even to the end of the reign of Charles the First, there existed schools, in which the Brehon laws were taught. Why did not he apply to some of these for information? The probability is, that he did apply, that he was well acquainted with the Irish law respecting Eric; but, as it was the fashion of the day, for political purposes, to vilify and debase the Irish character, he concealed his knowledge, knowing that a publication of the truth would tend to injure his own interests, and disoblige his patrons.

If none of the Brehon laws were now in existence, there are sufficient proofs, in the ancient manuscript annals of Ireland, to show, that the crime of murder was not punished merely by a fine; for numerous instances occur, in which it appears that the pain of

death was inflicted on perpetrators of that horrid offence. That the murderer was deprived of all his rights and privileges is evident from the laws still existing. In a tract, entitled “Pleadings in favour of senior succession to the sovereignty, according to law,” published by the late General Vallancey,* we find the following:—

“Cuis ele chuireas **B.** ó thighearnas, .i. **B.** do bheth fionghalach. .i. fuil a fhine fén do dortadh dó. Mar ader dergfhine i. an fine fionghalach. An fionghalach umurro berid fine a diobhadhsidhe & ni bherid a chion, & ni bhreannsomh diobhadh na fine & beridh a chion. Aseadh a chiallsin. .i. ge be neach dheargus a lamh ar a fhine fein ag dortadh a fola gurob fear fionghaile mur sin e, & nach coir a cor i ttighearnus. Agus fos ata do reir dlighidh nach ttéd a chion ara fhine (mur adertha cion comhoguis &c.) & go tted a edbracht a laimh a fhine ara shon sin. Gidheadh ma do ghéana an fionghalach peannait do Dhia & eric do dhuine ar son a mhighniomha do gebh a chuid ronna do edhreach! a athair & a sheanathair fén, & ni fhaghann cuid don fhearann edhreachta coitchinne, bhios ag an fhine uile. Agas ader dlightheadh, *gu rataigheas & gui edireas & gu tuarasdal & goid & etheach & feall & fionghal & dúinetaidhe go tteasdan a lainenechlan ó dhuine fa gach énuí diobhsin, & fechtar ma taid sin no eanchor diobh ar **B.** go tteasda a laineneachlan uadha, & ar na hadhbharaibh reamraite uili, gur teagcur flaitheas ris & gurob do **A.** dleagar a thabhairt.”—“Another cause excludes **B.** from the sovereignty, *i. e.* **B.** being a murderer, *i. e.* the blood of his own tribe has been shed by him. As it is said of a Deirgfhine, *i. e.* a tribe of murder, *For the murderer, moreover, the tribe**

Collect. de. Reb. vol. I. page 407. The translation, for reasons obvious to the Irish Scholar, differs in some things from that given by the General.

“ *take his inheritance, but they take not upon them his guilt, and he*
 “ *takes not of the inheritance of the tribe, and he bears his crimes.*”
 “ The meaning of which is, *viz.* Whoever reddens his hand on his
 “ own tribe, by shedding their blood, is therefore a murderer, and it
 “ is not proper to place him in the sovereignty. And also it is ac-
 “ cording to law that his crime shall not be imputed to his tribe,
 “ (as it is said ‘ *the crime of a relation,*’ &c.) and that his inheri-
 “ tance shall pass into the hands of his tribe on that account.
 “ However, if the murderer does penance to God, and gives *Eric*
 “ to man, he receives his share of the inheritance of his father and
 “ grandfather, but he obtains not any portion of the land, the ge-
 “ neral inheritance of which belongs to all the tribe. And the law
 “ says, ‘ What establishes falsehood, and what gives fraudulent se-
 “ curities, and what hires falsehood, and theft, and lies, and trea-
 “ chery, and murder, and house-robbery, that full penalty shall be
 “ levied off a man for each of these. And it is seen that if these,
 “ or any of these, be fixed upon B. the full penalty shall be levied
 “ off him; and for all the aforesaid causes the sovereignty shall be
 “ cut off from him, and it is lawful to give it up to A.”

Amongst the Seabright manuscripts, in the Library of Trinity
 College,* are to be found some very ancient fragments of laws on
 murder, &c. from which the writer of these sheets would gladly have
 made full extracts; but was prevented by the strict regulations of the
 College respecting the use of its manuscripts. He has, however, by
 the liberality and patriotism of a gentleman, who possesses a good
 modern copy of ancient laws, transcribed from vellum manuscripts
 of high antiquity, been enabled to collect some information on the

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* Class H. 53. p. p. 431 and 644, and class H. 54. p. 329, &c.

crime of murder, and on the manner in which the Eric was to be collected and distributed.

By a law-tract, regulating the property, &c. in bees, we find, that there were certain crimes, the perpetrators of which no sanctuary could screen from justice. “Acht seact neludaig do chuis in la *
 “fornaidm nemed Dé na duine ————— taid cu fomdil agus
 “elodaig Fine ; fer airmderg ; ben aslui a cáin lanamna ; acas ben
 “no fer aslui gairi a mathair no athair, inge madh nech ná duine
 “in neoch ma fo facebat duine oirngne di és fri imbi cóir do tintudh.”
 “There are seven fugitives in the law, which are not protected
 “by a *Neimhid* of either God or man.” † ————— a lurking
 “thief ; deserters from a tribe ; a man with blood-red arms ; ‡ a
 “woman who flies from her matrimonial engagements ; a man or
 “a woman, who flies from the assistance § of a mother or father ;
 “the same of one who renders not justice after his theft ; for no
 “*Neimhidh* of either God or man can afford protection to the man
 “who leaves behind him plunder unrestored.” ‖

By another law we find that a man guilty of certain crimes, amongst which is included murder, was incapable of enjoying a superior rank in his tribe. Again, by another law, the *Dergfine*, or persons guilty of murder, were excluded from their portion of the tribal inheritance, because the tribe were obliged to pay for their crimes.

From the quotations just now given it appears, that the crime of murder not only excluded a man from the enjoyment of all the

* The word here written *la* is a contraction commonly used in ancient law tracts to represent the word *FENECHAS*, or old law ; but, in the manuscript, the *l* has a short horizontal stroke drawn across it, which is a character not to be found in any fount of types hitherto cast. The reader is therefore requested to take notice, that, in these extracts, *la* is to be always understood to represent *Fenechas*.

† An ecclesiastical or lay noble. ‡ A murderer. § Who deserts a parent in necessity.

‖ This law is to be found in the Library of Trinity College, H. 34, in that of the Royal Irish Academy, and in the collection of the writer.

rights and privileges to which he had been entitled amongst his tribe had he been innocent, but also that no sanctuary could protect him from punishment. It appears that fraud, falsehood, or the subornation of falsehood, theft, lies, treachery or robbery, deprived a prince of his right to inherit the sovereignty of his nation ; and that no power, ecclesiastical or lay, could screen from the vengeance of the law, the adulterous woman ; the deserter from his tribe ; the persons, male or female, who were insensible to the calls of nature, and fled from their parents in the hour of their distress. And, for so far, it can hardly be denied, that the ancient Irish laws had a more moral tendency than those of several *polished and civilized nations* of modern times.

Amongst the College manuscripts* is to be found a law, that prescribes the proportions, in which *Eric* was to be levied and distributed amongst the members of a tribe ; from which the following extracts are given :

“ *Conall gaibais allaimh do rot do dam sort hirroi contorchartar fair inna landiri so is de ruccad la.† Cia ro it dire agus areir acas enecland ? Saigid dire co secht cumal, saigid areir co cumal, saigid eneclainn co tri seotu.*”

“ *Landire in athair, leth dire i mbrathair mathar, trian dire ina mic no ina ingen, cethramthi diri inna ua, enecland o ta sen, acas aireir acas a diburdud.*”

“ *Landiri i mathair, leth dire i siair mathar, trian dire inna macse no inna ingen, cethramthu dire inna ua enecland ó ta, &c.*”

“ *Landire i mbrathair o athair, lethdire inna macside no inna ingen, trian dire inna ua, enecland ó tha.*”

“ *Lethdire i mbrathair o mhathair, trian dire inna macside no inna ingen, cethramthe dire inna ua eneclann ó tha.*”

* Class H. No. 34.

† See Note (*) p. 194

“ *An ti nad ail, nad gialla, nad ceile fuisethen ni hictar dire nach airiur nach enecland la.*”*

“ Whoever proceeds on a road, or passage, and is there killed, the full penalty is given by the law. What is the penalty, the satisfaction, and the reparation? The penalty extends to seven cumals,† the satisfaction to one cumal, and the reparation to three seots.‡

“ Full penalty in the father, half penalty in the father’s brother, one third penalty in the son or daughter, a fourth of the penalty in the grandson, reparations § from these out, together with satisfaction and expulsion.

“ Full penalty in the mother, half penalty in the grandmother, one third of the penalty in the son or in the daughter, one fourth penalty in the grandson, reparation from these out, &c.

“ Full penalty in the brother by the father, half penalty in his son or in his daughter, one third penalty in his grandson, reparation from these out, &c.

“ Half penalty in the brother of the mother, one third in his son or daughter, one fourth in his grandson, reparation from these out, &c.

“ He who has not fostered, nor given security, nor entered into association with the aggressor, pays neither penalty, nor satisfaction, nor reparation according to the old law.”

Here we see, that the Eric or atonement made for murder did not exclusively fall on the blood relations of the malefactor, nor was it entirely received by those of the person murdered. The fosterer

* See note (*) p. 194. † A cumal was three perfect cows, or an equivalent thereto.

‡ Seot or seod signifies a thing of value; a jewel, a cow. The commentator on this passage explains it by three *Colpachs* (heifers or steers) or two heifers and a *Samhaisc* (*i. e.* a calf upwards of a year old).

§ The Commentator says, “ the ninth or tenth degree of relations.”

was subject to the penalties incurred by the crimes of his *Dalta*,* and he was also entitled to a portion of any fines or reparation that might be made for injuries done to the person fostered.

A *Fuidhir* or person holding lands by tenure from a lord, not of his own tribe, was exempt from fines for offences committed, either by himself, his sons, daughters, family or relations; nor did he receive restitution or reparation for any damages, or injuries, done to himself or any of those persons. The *Flaith* or prince, under whom he held his land, was subject to all his fines and penalties, and received the restitution or atonement for all the losses or injuries sustained by himself or his family.

We shall hereafter see how the *Eric* and fines, arising from offences committed by women or against them, were levied and disposed of, when we come to give specimens of the laws respecting females. At present, it is presumed, sufficient examples have been given to show what the law was, relating to *Eric* in general, as it was practised by the ancient Irish.

If the Irish laws for punishing offences by *Eric* be properly and dispassionately considered, it may, perhaps, be acknowledged, that it was not a barbarous law, but a wise and salutary measure, calculated to prevent crime, and to compensate, in some degree, persons who had suffered injury. Those who have studied human nature know, that there are persons who would not be deterred from the commission of crime, by the consideration of any consequences that might result to themselves from their misdeeds; but, if they be convinced, that the punishment of their offences will not fall

* *Dalta* or *Dailte*, a foster child, a ward. Sir John Davis says, "Fostering hath always beene a stronger alliance than *bloud*; and the foster-children do love and are beloved of their foster-fathers, and their *Sept*, more than of their owne natural parents and kindred; and do participate of their meanes more frankelly, and do adhere unto them in all fortunes with more affection and constancy." *Discovery*, &c. London, 1747, page 180.

upon themselves only, but that their parents, their wives, their children, and relations, must all participate in the pains and penalties to be imposed, they will desist from the perpetration of crime, through tenderness to their family and connexions. Again, let it be considered, that, according to the law, the Eric was to be imposed in a greater or lesser degree, upon the entire tribe to which the malefactor belonged, and it will be perceived, that it was the interest of every person to keep a strict watch on the actions of his tribesmen, and to prevent the commission of a crime, which would certainly bring loss upon himself and all his relations. By the payment of Eric, the malefactor was punished, and the person injured received some compensation for his losses: an act of justice more satisfactory, more equitable, and more productive of salutary consequences, than some of those sanguinary punishments prescribed by modern civilization.

The law of Eric, the candid and judicious Doctor Warner calls “the law of retaliation.” Contrary to Spencer, Davis, and others, he says, “that by the tenor of this law the people of Ireland were brought to more humanity, honesty, and good manners of every kind, than they ever were before.—It is not only the most equitable in itself, I presume to say, that can be conceived, against wilful injury, but in its consequences bids fairer than any other to promote public order and integrity.”—He adds, “We presume too much on our power of making laws, and too far infringe on the command of God, by taking away the lives of men in the manner we do in England, for theft and robbery; and this is not only a pernicious error,—‘for extreme justice is an extreme injury’—but a national abomination.—The wilfulness of the crime is no excuse for making the punishment exceed the heinousness of the transgression; and who will say that a little theft or robbery,—

“ perhaps of the value of two or three shillings only,—is not
 “ punished infinitely beyond a just proportion, when it is punished
 “ with death.”*

The Irish laws of Tanistry and Gavelkind are represented by Sir John Davis as sources of the greatest evils to the nation. “ *Tanistry*,” he says, “ is the cause of such desolation and barbarism in
 “ this land, as the like was never seen in any country, that professed
 “ the name of Christ.” He adds, “ Yet I dare boldly say that never
 “ any particular person, eyther before or since (the raigne of Henrie
 “ the Second) did build anie stone or bricke house for his private
 “ habitation, but such as have latelie obtained estates according to
 “ the course of the law of England. Neither did any of them in all
 “ this time plant any gardens or orchards, inclose or improve their
 “ lands, live together in settled villages or towns, nor made any
 “ provision for posterity; which, being against all common sense
 “ and reason, must needs bee imputed to those unreasonable cus-
 “ tomes, which made their estates so uncertaine and transitory in
 “ their possessions.”—To the custom of *Gavelkinde*, Sir John attributes the poverty of the country. “ For,” he says, “ *Gavelkinde*
 “ must needs in the end make a poore gentility.†

In these short quotations we have a melancholy proof of how hard a matter it is for men, even of liberal education, to divest themselves of prejudice, or to do justice to the character of those whom it may be their interest to vilify and traduce. The learned Attorney General must have well known, that the Irish did dwell in towns and villages long before his countrymen ever obtained a footing in Ireland; and also that they did build houses of stone

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* History of Ireland, Dublin edition, octavo, vol. I. p. 258, 259; and History of Utopia, note, p. 42, 43.

† Discovery of the True Cause, &c. p. 170. 1. 2.

long before the period he mentions. The laws for regulating the affairs of *Raths* or villages, and the concurrent testimony of all our historians, prove the first; and the second is proved from equally good authority. The Irish Annals record the erection of several stone houses, and the *Seanchas bheg*, a very ancient law tract, grants privileges and assigns liberal rewards to artists skilled in the construction of such edifices. But even if the Irish houses were built of timber only, which, it is acknowledged, they generally were, how does it prove that the Irish people were barbarians? If dwelling in wooden houses were a proof of barbarism, the inhabitants of the great city of London were barbarous so late as the polite reign of King Charles the Second; for it was owing to the principal part of the houses being composed of timber, that the great fire, which happened in that city in the year 1666, was so destructive. That the Irish did enclose their lands, and plant gardens and orchards, he must have been an eye witness. Why he uttered a falsehood on this subject, the writer of this essay might assign reasons; but, at present, he chooses to leave it to others to conjecture.

That the Irish did enclose their lands, and that the preservation of those enclosures was provided for by laws, the laws themselves are incontestible evidence, independent of the authority of history. In the library of Trinity College, * is to be found a fragment of a law-tract beginning "*Leath Cathach a tairsciódh, &c.*" that prescribes the manner in which fences for the enclosure of land should be constructed, and imposes heavy penalties for breaking through them. This fragment has been published by the late General Valancey; † and, although the translation may not be quite correct,

* Manuscript Room, Class H No. 54.

† Collect. de Reb. Hibern. vol. 3, p. 71.

it is sufficiently so to enable the reader to satisfy himself, that such a law exists, and that Davis is not to be depended on when he speaks of Irish laws and customs.

That the lands of Ireland were highly cultivated in former times, is proved from the marks of the plough being still visible on the tops of now uncultivated mountains, and from similar marks being daily discovered in the bottoms of our bogs. That the Irish had a superior skill in agriculture will, perhaps, be allowed, when it is known, that the irrigation of their lands was practised by them at a very early period. In an ancient law-tract on artificial water-courses, or canals, to be found among the manuscripts in the library of Trinity College;* in that of the Royal Irish Academy; in the collection of the writer of this essay; and in some other private collections, we find the following:—“ *Coibnius uisci toiridne hi finte-
“ daibh griain as as a tairnider, ar isse coibnius uisce tairidne la
“ fenechas tir as a tairidnither, ar isse don ailes cach cé t lá deo-
“ laidh sech na cricha olchena, air ni confes cate bunad ind uisce
“ ach a tir as a tairidnither.”* “ The common right of drawn-
“ water is in the tribes of the land from which it is drawn. For,
“ according to the Fenechas, the common right of drawn-water be-
“ longs to the land from which it is drawn. It is therefore that all
“ require, that it shall run freely the first day over the entire
“ land.† For the right in the water belongs to none but in the
“ land from which it is drawn.”

It is confessed that the law of Tanistry, in the present state of society, is unnecessary, and would be inconvenient if put in prac-

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* Manuscript Room, Class H. No. 34. page 26, and Class H. No. 54. p. 398.

† The commentator informs us, that the water thus drawn was applied on different days to different uses, and that no charge should be made for water thus applied to the use of the land.

tice; but that it was so at its first institution, and even down to a comparatively late period, is denied. Tanistry had for its object the prevention of public commotion and disturbance, and the preservation of public peace. Whilst Ireland was ruled by her native monarchs, and governed by her own laws, the offices of Monarch, provincial Kings, and *Taoiseachs*, or chiefs of tribes, were hereditary in particular families, but elective in the persons. This custom, although it preserved the liberties of the people, and saved them from being governed by a man of imbecile mind, a woman, or a child, was the cause of frequent wars, and consequently of much blood-shed; for, upon the death of a king or chief, different candidates of the same family became competitors for the vacant office, and each endeavoured to carry his election by the number of his adherents and the force of arms. To remedy this evil, and yet to preserve the rights of the people and the established mode of succession, by which the most worthy of the tribe should rule, the laws provided, that, during the life-time of the reigning monarch, king, or prince, a proper successor should be appointed. For this purpose, the persons having the power to elect assembled in a particular place, appointed for the purpose, and there, after mature deliberation, selected for their *Fear Tanaiste*, (i. e. their second man) that person amongst the family of their reigning prince, who, from his superior understanding, prudence, and courage, was most likely to rule over them with justice and wisdom, in times of peace, or lead them to victory in war. The choice seldom fell on the son of the chief in being; but frequently his brother, or some other near relation, was appointed his successor, during whose subsequent government the son of the then chief might be elected Tanaist. But, notwithstanding all this precaution to prevent public commotion, upon the death of a king or prince a new candidate would often

start up in opposition to the Tanaist ; and, if his friends were sufficiently powerful to support him, seize upon the government. But in these contests it seldom happened, that the son of the deceased prince became the competitor of the Tanaist. Both the ancient customs and the express laws of the country were against his claims. For these provided, that the senior, if deserving, should be declared the *Ceannfinè*, or head of the tribe : a custom which was agreeable to the practice of other ancient nations, of which a striking example is given in the succession of the kings of Edom, in the first book of Chronicles, chap. i. beginning at the 43d verse ; to which might be added the authority of Strabo, to shew that the Scytho-Iberian kings were chosen from amongst the *seniors* of a particular class of the people, and also that the possessions of the people were held in common.* In like manner Procopius shews, that, according to the royal succession observed by the Vandalic nation, the king should be always the *eldest prince* of all those who were descended in the male line from their king Geseric, without any regard being had either to their rank, or to the proximity of blood in which they stood relatively to the late king their predecessor on the throne.† The same author informs us,‡ that all the Gothic tribes, including the Vandals, observed the same laws and customs, and used the same language ; from which we may infer, that all the various nations of the Goths observed the custom of advancing to the office of chief the *senior* of their respective tribes. Similar practices in other ancient nations might, if necessary, be produced to prove, that the Irish were far from being singular in their laws respecting the appointment of their chiefs from amongst the seniors of their tribes.

* Strabo. Casaboni, Paris, Folio 1620. Lib. 11. page 501.

† Procopius de Bell. Vandal. Lib. I. Cap. 7. 8. ‡ Lib. I. Cap. I.

By the custom of senior succession, or the succession of the *Fear Tanaiste*, women were excluded from taking a lead in the state; but it is not true, that they were excluded from the inheritance of lands. If it would not extend this essay to an unreasonable length, examples might be given from the ancient Irish laws, sufficient to prove, that women exercised the right of chiefry over lands, properly their own, and had a power to dispose of all their chattel property at their pleasure. A women was not, indeed, to inherit or enjoy the lands appropriated to the maintenance of the chief of the tribe; but care was taken, that her own patrimonial lands should be secured to her, although she was deprived of the power to alienate or transfer those lands without the consent of her family. If her husband was of a tribe different from herself, he could not possess her lands after her decease; but her sons, if she had any, should have the inheritance.

The custom of appointing, during the life time of a king or chief, a *Tanaist* to succeed him after his decease, was in use from almost the earliest periods of Irish history; but it does not appear from the laws, that any lands were appropriated to the exclusive use of the *Tanaist*, as *Tanaist*. A portion of lands were, indeed, allotted as demesne lands, for the use of the chief during his incumbency, and which, at his decease, were not gavelled or distributed amongst the tribe, as the other lands were, which he held in common with them; but the *Tanaist* had no control over those lands, nor any greater right to possess them than any other member of the sept, except such as he had in expectation from his situation as *Tanaist* to become the successor of the chief.

Some Irish historians assert that the *Tanaist* exercised the office of chief judge and principal commander of the armies of his chief; but there is nothing in the Irish laws, nor is there any particular

instance or fact, given in the annals, which would prove that the power of judicature was ever vested in the Tanaist. That he had the principal command of the forces in the absence of his chief cannot be doubted; his situation, and his interests made him the most proper person to execute such an office; but, in all wars where the chief was present in person, which he generally was, he alone had the sole command of the army.

From what we have now seen it is evident, that the custom of Tanistry could not be productive of those evils, which are attributed to it by Sir John Davis. Let us now take a view of the law of Gavelkind, and see what probability there is, that he has not misrepresented that custom also, and attributed to it evils that it never could have produced.

Some have imagined, that the ancient Irish held their lands upon a tenure similar to that by which the military benefices established by the Roman Emperors, and the Salic land of the Franks were held; but this is evidently an error. The Irish lands were hereditary in the tribe, and could not be forfeited by or lost from the tribe, by any delinquency in the chief; who had only a life interest in the lands, and whose crimes could not be visited on the unoffending members of his sept, in any greater degree than the payment of an *Eric*, prescribed by the law in proportion to the offence. The Roman benefices, on the contrary, were not hereditary, and were liable to be forfeited by the possessor for a bare omission of civil duty, such as the neglect of discovering or not delivering a robber into the hands of justice, and other such offences as could not be considered grievous enough to cause the forfeiture of hereditary property.*

* Abbe Dubos, *Hist. Crit.* Tom. 4. p. p. 323. 324.

The custom of *Gabhail Ciné* (a partition of a family) or Gavel-kind, as it is called by English writers, has been but very imperfectly understood or explained by all who have hitherto published any thing on that subject. This is owing to those authors being unacquainted with the laws prescribing the mode of partition, and the proportions which each *Finè* or tribe was to receive on a partition of the tribal lands, or of the *Érics* or fines accruing to the sept. General Vallancey says, “ The Irish custom called Gavel-kind “ consisted in dividing the father’s hereditary lands among all his “ sons, utterly excluding the daughters from enjoying any share of “ the landed inheritance.”* How far this account is correct, and at the same time what the real nature of the *Gabhail Ciné* was, may be collected from the laws on that subject amongst the manuscripts in the library of Trinity College.†

The inhabitants of every district in Ireland were divided into the following *Finés*, tribes or families, viz :—“ *Geil-Finé ; Deirbhfiné ; Tar-finé ; Ind-finé ; Derg-finé ; Dubh-finé ; Finé-taccur, Glas-finé ; Ingen-ar-meraib, and Dua-finé. Here ends the Finés or tribes.*” The members and proportions of these tribes are set down as follows :—

1. “ *Geilfine co cuicer, is iside gaibhes dibad cach cuid comocuis “ di nech dibhadh uaidhe.*” *Geilfiné* extends to five persons. It is it that receives the inheritance of their (own) relations who die.

2. “ *Deirbhfine co nonbar, ni dibadh uaidhe cobrand for lín “ cend comocuis.*” *Deirbhfine* extends to nine persons ; “ the inheritance of those who die is equally divided amongst the relations.” The Commentator on this passage adds, “ with *athghabhail,*” i. e. *resumption of property,* “ to the persons before mentioned.”

* Collect, de Reb. Hib.

† Class H. No. 54.

3. “ *Iarfine, co tri feraibh déc, ni beiride acht cethramhain di cin no somhaine, di orba, na di saetur.*” “ Iarfine to thirteen, they obtain but one fourth of the inheritance of wealth, or land or labour” (*i. e.* the fruits of industry). The Commentator says, “ with *athghabhail*, to the two tribes above mentioned, for three quarters of four belong to the *Geilfine.*”

4. “ *Indfine co sect firu déc, conranda cadesin finteda di neoch diba uaide, amail bes coir; duthaigh duine otha sin, is ann scarait fintedha.*” “ Indfine to seventeen men, they divide between them the inheritance of such as die from amongst them, in the manner that is just; from this out it is a country, or district, of people, for in this the tribes divide.” The Commentator explains the latter part of this by saying, “ from this out it is not a landed property of *Finés*, or tribes, but a land of “ people,” *i. e.* in common to the people.

5. *Dergfine, isside cruies, ni diba huaide, ni cobranaide finnted, issedh icaid cinta comocuis.* “ Dergfine are those who spill blood (*i. e.* who commit murder) they receive no inheritance, they are not coparceners with the tribes, they pay the forfeits of their relations.”

None of the other *Finés*, above mentioned, appear to have had right to any proportion of the property gavelled; but they had a common right to the land for their support.

From the Monarch down to the chief of a district, each had lands allotted in proportion to his rank and dignity; and, in addition to these lands, the law provided for them other sources of revenue, which amply supplied them with all things necessary to support their state. These were furnished to each by their respective followers or dependents. They consisted not in money, but in articles of all descriptions necessary for the supply of the table; in clothing of the

most sumptuous kinds ; in instruments of music and other articles for amusement in the chamber ; in dogs, hawks, &c. for the diversions of the field ; in ships, horses, military instruments, &c. &c. &c. All these were paid according to established rules, and in the proportions prescribed by the *Leabhar na cceart*, or book of rights ;* and no king or prince had a legal right to levy more.

For the support of a chief or petty prince of a district, independent of his own mensal lands, each *Rath*, village, or settlement of people, was obliged to contribute in proportion to the quantity of lands occupied by the *Rath*, and these proportions were regulated by law. The *Raths* were of different ranks, and their possessions various. The laws respecting them are interesting and curious, but extracts from them here would too much extend this essay.

Upon the subjects of gaveling and resumption of land, there is much interesting information to be collected from the ancient laws amongst the manuscripts in the Library of Trinity College. But, although the writer of this essay has had an extraordinary indulgence in his access to those manuscripts, and although he can never sufficiently express his sense of the obligations which he feels himself under to the board in general, for their kindness in admitting him to the privilege of the Library, or express his gratitude for the polite, indeed friendly, attention he has experienced in his visits to the Library from the Librarians of the College in particular, he has still to regret, that the strict rules of the College, with respect to their manuscripts, have prevented him from making that use of those valuable documents which he would wish to have done, and which

* Ancient copies of this Book are to be found in the Libraries of Trinity College, and the Royal Irish Academy. For a description of this Book, and an account of its contents, see "Transactions of the Ibero-Celtic Society," page 28.

would, perhaps, have enabled him to make this production more interesting than it is at present. The author submits, that, if the same facilities were allowed to the Irish scholar to consult the numerous ancient manuscripts in his native language, deposited in the College Library, that are allowed to the readers in the printed part of the Library, it is probable, that, notwithstanding the little encouragement given to literary productions connected with Ireland, some instructive and interesting articles on the ancient state of our country might have long since been laid before the public.

It has been urged as an argument against the customs of Tanistry and Gavelkind, that women were excluded from the inheritance of landed property. It is not, however, strictly true, that women were so excluded. They were, indeed, by the laws debarred from a participation in those lands that were subject to be gavelled; but there are sufficient examples in those laws to shew, that women did possess landed property, and might dispose of chattel property, although they had not a power to alienate any of their lands from the tribe to which they belonged. But, supposing that Irish women did not enjoy landed property, the same must be said of the women of several other ancient nations. There is not, perhaps, a single instance to be found in the Old Testament where sisters shared with their brothers the landed inheritance of their father; and it is notorious, that the Romans, Franks, and other ancient nations, excluded women from the possession of lands that must be defended by the sword, as well as they did from the sovereignty.

It has been also asserted, that the law of Gavelkind was a bar to the improvement of the country, inasmuch as no man would improve land that he knew would not be enjoyed by his children. This also is a falsehood. The uncultivated state of Ireland, at the commencement of the seventeenth century, arose from causes quite

different from any that could result from the law of Gavelkind. It arose from a long period of near 500 years sanguinary warfare, carried on by the natives on one side, in defence of their natural rights and liberties, and on the other by the English colonists, to establish their dominion over the island. It is not true, that the man possessed of lands would not improve his possessions, under the impression that they would not be enjoyed by his children, his relations, and his friends, who were to survive him. He was not apprehensive that a libertine son or an unnatural brother would exclusively enjoy the fruits of his industry : for he knew that his deserving children, if he had children, would be amply provided for ; and, if he had no children, his tribe, which to an Irishman was no small object of regard, must profit by his improvements. It is true, that mansions constructed of brick or stone were not generally used by the people of Ireland ; but this does not prove, that they had not durable, and even sumptuous buildings for their private dwellings. Whoever has read the splendid descriptions of buildings to be found in the popular tales of the ancient Irish, must be convinced, that they could not be merely the effects of a fertile imagination ; but that their authors must have had models before their eyes, from which they gave pictures, highly coloured to be sure, but which prove that they drew from originals.

By the quotations above given, and the authorities referred to in ancient manuscripts, it is apparent, that the customs of Tanistry and Gavelkind could not be productive of those evils which are attributed to them by Sir John Davis, and others, who, without examination, have re-echoed his words. The same authorities also give us good grounds to doubt the veracity of Sir John's assertion that " Gavelkinde must needs in the end make a poor gentility." The riches of an Irish chieftain consisted in a number of hardy and

faithful followers, with the means to support them and to reward the deserving. These he enjoyed, and with these he was content. He took no pride in the life of a voluptuary, nor in the prospect of having one son born to loll in a carriage, and to be furnished with means to lead a life of luxury and libertinism. Neither had he the heart-breaking consideration, that some of his more deserving children would be, perhaps, compelled to prostitute their talents to unworthy purposes; or by a resort to the gambling-house, or by other infamous means, plunder the unwary and inexperienced, in order to procure for themselves the means of *appearing like gentlemen*. The necessity of resorting to such villainous shifts was prevented by the law of Gavelkind. The custom was therefore so far from being barbarous or productive of the evils attributed to it, that it may be considered as the source of many salutary consequences, and supplied the means of support, in an honorable way, to every member of the tribe, and precluded the necessity of poor laws or mendicity associations.

The learned Attorney General blames the *poor* Irish gentry, because “ they did scorne to descend to husbandry or marchandize, or “ to learn any mechanical art, or science.”* If this were a crime, it is one in which they are imitated by the *poor* Irish gentry of the present day; for we do not see the hopeful young slips of modern nobility or “ gentility” much more desirous to make themselves useful in their generation, by learning a mechanical art, than were the sons of the ancient Irish chieftains. But, be this as it may, it is a fact, that, although the Irish gentry did not descend to husbandry or merchandize, or to learn any mechanical art or science, they gave liberal encouragement to those who followed such occupation. This is

* *Discovery of the True Cause, &c.* London, 1747, p. 172.

indisputable. The old code of laws called the *seanchas bheg*, so often above mentioned, provides, in a munificent manner, privileges and rewards for the encouragement of professors in various arts and sciences. Hence it was, that the ancient Irish exceeded all the other European nations in the manufacture of woollen cloths, which they exported to England as well as to several other nations on the continent.* A lucrative branch of commerce, that gave employment to numerous hands, and of which Ireland, for the benefit of England, was unjustly deprived in the reign of King William the Third.

In addition to those laws, already referred to, there are a variety of ancient laws, still extant, which were well calculated to protect property, to reward merit, to discountenance vice, and to encourage virtue. There was no class of people, from the highest to the lowest, but were amenable to justice, nor was there one law for the rich and another for the poor; but to all justice was administered with impartiality. To prevent extortion, the prices of almost every article were regulated by law, even to the value of labour and the fees to physicians.

By a law tract in the College library,† the prices of a variety of articles are determined. A part of this tract has been published by the late General Vallancey;‡ but what he has given as a translation is, in many places, not at all like the original. It may, however, serve to give the reader, who does not understand the Irish language, some idea of the nature of its contents. Appendant to a large volume of considerable antiquity, on the practice of medicine, in the

* See an Essay on “*The Antiquity of the Woollen Manufacture in Ireland*,” by the late Earl of Charlemont, published in the first volume of the Transactions of the Royal Irish Academy.

† Class H. No. 34.

‡ Collect. de Reb. Hib. vol. 1.

collection of the writer of this essay, there is a law tract prescribing the fees to be paid to physicians upon the recovery of the patients from sickness, and regulating other matters connected with the professions of surgery and medicine. How liberally the practitioners in these sciences were to be rewarded *upon the recovery of their patients*, the following extract from the beginning of that tract will show.—“ *Bretha Crolige. Cis lir ro súidiged crolige la f̄ee ? co direnaiter, co errenaiter, co ottruiter. Direnar crolige mbais caich fomiad. Da secht Cumal crolige cach righ agus cach epscop. Secht cumal agus leth croilige cechtar de in da airigh forgill istaire, inunn ota airig nard conig airech tuisi. Vii cumal croilige cach airech tuisi, agus cach airech desa corige bo airech. Teora cumal crolige cach bo airech acas cach oc airech. Di cumal crolige cach flesearch acas cach mogadh.*”—“ Law of sickness. What is established relating to the cure of sickness? That it be satisfied for, that amends shall be made for it, that it be rewarded. Every honorable lord satisfies for the cure of death sickness” (*i. e.* sickness in which there is danger of death;) “ twice seven *Cumals*,* for healing the sickness of every king and of every bishop. Seven *Cumals* and a half for the curing of either of the two inferior *Airechforgill*;† the same satisfaction from the *Airechard* down to the *Airech tuisi*; seven *Cumals* for cure from every *Airech tuisi* and every *Airech desa* down to the *Bo Airech*. Three *Cumals* for the healing of every *Bo Airech* and every *Oc Airech*. Two *Cumals* for the cure of a rustic or slave.”

* A cumal was three cows, or the value thereof.

† *Airechforgill*. *Airech* was a title of honor and respect with the ancient Irish. The *Airech forgill* was the person considered a sufficient hostage or pledge for the person of the chief: the *Bo-airech* was the lowest in degree, he derived his rank from his property in cattle.

In the laws relating to women,* the penalties they incur for crimes and the *Eric*s or mulcts paid for injuries done to them, are divided amongst certain persons of their tribes in established proportions.

“ *Cis lir ro-suighighide fodla febhe la Fenechas fria bandire ? co icaither a cinaid ? co berdar a neirce acas a ndithbha ?* ”

“ How are established the distinctions of the rights appertaining to women, according to the old law ? How are their offences satisfied ? How are their *Eric*s and their inheritance distributed ? ”

“ *Cin cetmhuinte for a mic for a fine is amlaid fria eric acas a ndibad.* ” The offences of one of a chief family falls upon her sons and upon her tribe ; in like manner her *Eric*s and her inheritance are distributed.”

“ *Mad cetmhuinte nad ruicce macu confodlaite a cinside inde etir a fine acas a cele is amlaid fria eiricc acas a dibad.* ”—“ If she be one of a chief family, who has borne no sons, her trespasses are equally divided between her tribe and her husband. In like manner are distributed her *Eric* and her inheritance.”

“ *Os ben aittiten ara naisc fine conranaithe a cinaidside etir macu acas a fine is amlaid fria neraic acas a ndibad.* ”—If a woman protected under bond to the tribe, her trespasses are equally divided between her sons and the tribe, in like manner her *Eric* and her inheritance.”

“ *Os ben nad aurnascar nad forngar ar da trian fora fine dia cin oentrian for a bronfine, is amlaid fria ericc acas a ndibad.* ”—If a protected woman not under bond or control, two thirds of her trespasses fall on her tribe and one third on her *bron fine* (*i. e.* the family of her womb, her children) : in the same manner her *Eric* and her inheritance.”

* MSS. in the Library of Trinity College. Class H. No. 34.

“ *Os ben bis for focsul dar apud nathar no fine, la fine a neraic acas a ndibad, acas fer fo do coisle a cin acas a ciniud.*”—“ If a woman be forced away against the will of her father or her tribes, to the tribe belong her *Eric* and her inheritance, and on the man with whom she went fall her fines and trespasses.”

It would, perhaps, be superfluous to give here further examples to show how the crimes of women were atoned for by their tribes, or how the *Eric*s or mulcts paid for injuries sustained by them were distributed amongst the tribe to which they belonged. It may not, however, be improper to remark, that any woman, who had not by crimes or ill conduct brought damages or injuries on her tribe, had a right to dispose of all her chattel property to the Church; but she had no power to dispose of any part of the property belonging to the tribe without having obtained their consent for that purpose. Contracts entered into by women were generally invalid; for, without the consent of her *head*, (the guardian or the person under whose control she was,) she could not make any legal transfer of property. A father had control over the actions of a daughter, the chief family controlled a woman of such family, sons had a control over a mother who had children, a tribe controlled a woman of a tribe, the Church had control over a woman belonging to the Church. But although a woman could not buy or sell, or enter into contracts without the consent of her *head*, she might, with the approbation of her *head*, enter into contracts, and dispose of whatever was lawful for her to transfer in a public manner. If the husband of a woman was guilty of adultery, she had a power to separate from him; but upon no other occasion was a woman allowed to part from her husband.

If children above a certain age committed a fault, or did any injury to any person, the atonement was to be made in equal propor-

tions by the father and the foster-father of the child ; and in the same proportion was divided between them the *Eric* or mulct for any injuries it might sustain.

To prevent theft, severe pains and penalties were provided by the old law, for the punishment of persons convicted of dishonesty. We have already seen, at page 194, that no sanctuary could protect a thief who had not made reparation or restitution for goods purloined by him. The person from whom stolen goods were purchased was liable to make, upon discovery, full restitution ; but the purchaser, who paid full value for his purchase, was not liable to any other penalty on account of such transaction. The accessory to theft was liable to the same penalty as the actual perpetrator of theft ; because, said the law, “ if a man be not encouraged he will not steal.”*

To show the means used to prevent improper intercourse between the sexes, sufficient of the laws are still in existence. By these it appears, that the person who was convicted of the sin of incest was, in addition to heavy fines, to be expelled from the place where the crime was committed, and cut off from all privileges he might otherwise enjoy. He who committed adultery or fornication was subject to a penalty or fine. Married persons who were convicted of the crime of adultery, besides the usual reparation by *Eric* required by the law, were put under a penitential rule until their death. If a woman broke her marriage vow, and was guilty of adultery, if she had land, it became the property of her husband during her life ; in addition to which he had to receive from her father, if alive, a fine or mulct for her offence. If her father was not living, and that she belonged to a chief family, that family was obliged to make reparation. If she had sons, they were obliged to pay for the scandal and

* See MSS. in Trin. Coll. Class H. No. 53 and No. 54.

the injury. If she belonged to a common tribe, that tribe should pay the forfeit of her crime.*

Even for minor offences, the Irish laws provided proper remedies and modes of punishment. To prevent damages, or waste of property, by animals of every description, or by the neglect of persons having property in charge, punishments by fine were also provided, besides the full value of the damage being paid to the injured proprietor. Nor were the moral characters of persons unprotected by the laws, which prescribed penalties to be inflicted on the slanderer and the calumniator.

IX. *Observations on the difficulties attending a translation of the Brehon Laws.—Recapitulation.—Conclusion.*

A translation of the *Brehon Laws* has been represented by some writers as a matter of extreme difficulty, and by others as a thing absolutely impossible. The late Charles O'Connor of Balanagar, whose authority, on subjects connected with Irish Antiquities and literature, must always have considerable weight, has declared, that “ the Irish jurisprudence was almost entirely confined to the Phœnian
“ dialect, a dialect understood only by the *Brehons*, and law-advocates, and a few who had the curiosity to study our language.”—He adds, “ I have had an opportunity of conversing with some of
“ the most learned Irish scholars in our island, and they freely confessed to me, that to *them*, both the *text* and *gloss* were equally
“ unintelligible. The key for expounding both was, so late as the
“ reign of Charles the First, possessed by the Mac Egans, who kept
“ their law-school in Tipperary, and I dread that since that time it
“ has been lost.”† Doctor Ledwich, although utterly ignorant of

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• MSS. in Lib. Trin. Coll. Class H. No. 53.

† Ledwich's *Antiquities*, edition 1803, page 303.

every dialect of the Irish language, fearlessly asserts that a translation of the Brehon Laws is “ a thing impossible.”* These authorities, at first sight, might appear sufficient to persuade a man whose curiosity might be easily gratified, without the trouble of investigation, that an attempt to translate the Brehon Laws would be an unavailing experiment. Yet these authorities should not deter the Irish scholar from making the attempt. They are, in fact, to be considered as no authorities. Charles O’Conor does not say, that he himself had studied the Brehon Laws, and found by his own experience that they were not to be deciphered. He only says, that he was told by some Irish scholars that “ to *them* both *text* and *gloss* “ were equally unintelligible.” But this is not sufficient to prove that they are equally so to all others. As for the assertion of Ledwich, that “ the thing is impossible,” it can have no weight with any person acquainted with the language, history, and antiquities of our country ; who must perceive that the book, which he has miscalled the “ Antiquities of Ireland,” is, from the beginning to the end, a mass of misrepresentation and falsehood, that proves nothing more than the self-sufficiency of its author, and his utter ignorance of the genuine History and Antiquities of Ireland.

It must be admitted, that a translation of the Brehon Law would be a work of considerable labour and difficulty ; but to a man of industry and talent, who has a thorough knowledge of the ancient Irish language, the accomplishment of such a task is by no means impossible ; nor would it, perhaps, be so difficult as at first view it may appear. The *text* of all our law books is in the Fenian dialect ; but it is accompanied by an interlined *gloss*, which, in more modern language, explains the terms contained in it. Both *text* and *gloss* are, it is confessed, obsolete, and to the person who is acquainted with only the vulgar dialect of the modern Irish must be unintel-

* Ledwich’s Antiquities, edit. 1803, p. 302.

ligible ; but to those whose knowledge of the ancient language is more extensive, the case is otherwise. When Mr. O'Connor wrote, there was no dictionary of the Irish language that contained above eighteen or twenty thousand words. A translation of the Irish laws would, at that time, be therefore attended with great labour and difficulty. But now that there is an Irish Dictionary containing upwards of fifty thousand words, many of which are extracted from the ancient laws, and from other very ancient manuscripts, it is submitted that the principal difficulty attending a translation of the Brehon Laws is removed.

It would be irrelevant to the subject proposed by the Royal Irish Academy, to point out the method for reading and studying our ancient law books : but it may not be improper to say, that he, who intends to study those remains of Irish jurisprudence, must begin by making himself master of the contractions, with which they abound ; and of the *Ceannfhoctras*, or change of initials, which disguises the orthography, and throws great obscurity on the subject, and on the meaning of the words.

In the foregoing pages we have taken a view of some of the subjects treated of in the ancient laws of Ireland, of which copies of great antiquity are known to be still extant. From the existence of these copies it is evident, that those, who have denied that the ancient Irish had written laws, have either been misinformed themselves, or wished to mislead others. We have seen, from the concurrent testimony of all our historians, the catalogue which we have given of ancient lawgivers, and the internal evidence of the laws themselves, that the Irish institutes were formed at a very early period ; and we have arguments before us in support of the opinion, that those laws suffered no very great change from the time of their first enactment to the commencement of the 17th century, except so

far as they might be influenced by the introduction of the Christian religion, and by an improved state of civilization. From this view, and from the authority of candid and liberal English writers, referred to in the second section of this essay, it may be inferred, that a publication of those laws, accompanied by a literal translation, must furnish to the historian and antiquary much curious information, and throw considerable light on the manners and customs of the ancient inhabitants of several continental nations, as well as on those of Great Britain and Ireland. But it is to the people of Ireland in particular that a publication of the Brehon laws would be of the greatest importance ; because such a publication would be the best means of refuting the slanders of those who have thrown an odium on the character of our ancestors, in consequence of their attachment to those laws.

By some of those, who acknowledge that the ancient Irish had laws, it has been asserted that those laws produced anarchy and confusion, that by their effects they debased the human mind, reduced to the most savage barbarism the people who were governed by them, and caused this fruitful country to become a barren desert. Of those who have made this assertion, Sir John Davis may be considered the principal ; and, from his high situation, as Attorney General of Ireland, and the means he had of obtaining the best information on the affairs of the country, his authority is generally considered as incontrovertible. On this account his assertions respecting the laws of tanistry and gavelkind, and the ancient custom of compensating for murder by the payment of an *Eric* or fine, have been fairly examined, in the course of this essay ; and, to remove from the Irish character that obloquy which Davis and others have heaped upon it, a fair statement has been given of what those laws really were. In this statement, the writer has contrasted

the Irish laws of *Tanistic* or senior succession, of gavelkind, and of the compensation and atonement for crime by the payment of an *Eric*, with some of the ancient laws of England and other nations, not with a design of fixing the stigma of barbarism on those nations, but to show that Ireland was not singular in the practice of such laws and customs.

But the calumnies of Sir John Davis, of Spencer, and of others, who have re-echoed their slanders, have had a widely extended circulation; and the Irish have patiently lain under them for the long period of two hundred years, without scarcely attempting to shew their falsehood and injustice. The writer of this essay does not flatter himself with the hope, that his feeble efforts to remove long-confirmed prejudices, and to rescue from obloquy the character of his ancestors and those of his countrymen, can be effectual in the fullest extent: but he has a hope, that what he has advanced may have some weight with the candid and the liberal, so as to induce them to make further enquiries before they, on the authority of prejudiced writers, believe that immorality and barbarism are the characteristics of a nation, heretofore distinguished by the glorious appellation of "*Insula Sanctorum et Doctorum.*" To completely expose the falsehood of Davis, and others of his description, the most effectual mode would be to publish those laws, which they have taken so much pains to misrepresent. The writer would therefore call upon his countrymen in general, to step forward, whilst it is not yet too late; and, by the aid of the press, to rescue from oblivion the Brehon Law, under which their ancestors were governed, when Ireland was, by all, acknowledged to be "*the refuge of learning and the nurse of science.*"

In the course of this Essay, the writer has placed such of the Brehon Laws as he has touched upon fairly before the reader. It

is shewn, by quotations from those laws, that the murderer was not, as has been asserted, suffered to escape from further punishment by merely paying an *Eric* or fine as a compensation for his offence ; but that he was cut off from the society of his family ; that no sanctuary could protect him from justice ; and that, though he might in some cases escape with life, he was deprived of all the rights and privileges to which he would have been entitled, if he had not been guilty of bloodshed. It is shewn, that the custom of Tanistry or senior succession was a laudable one, observed by many other ancient nations ; and that, in this country, it was not productive of those evils attributed to it by Davis and others. It is shewn, that agriculture, so far from being neglected, was carried on to a great extent ; and that irrigation, which is considered a modern improvement, was provided for by law. It is shewn, that arts and sciences were encouraged in an extraordinary degree by the liberal rewards which the laws provided for their professors. And, it also shewn, that the law of Gavelkind was not productive of evil, or such as from its nature must produce barbarism, in those by whom it was observed. On the contrary, although the practice of it might be inconvenient in the present state of society, it is shewn, that, while practised in Ireland, it was a just and equitable law, by the operations of which every man, who had not by crime forfeited his birth-right, was ensured a sufficient maintenance, and a supply of all things of which he might stand in need. By the law of Gavelkind, although there might be “ a poore gentility,” no person could be in absolute poverty, and the necessity of poor laws and Mendicity Associations was utterly precluded.

In the course of this essay, it has also been shewn, that no privilege, lay or ecclesiastical, could protect from justice the thief, who had not made restitution for the property he had purloined ; the

woman who had broken through her matrimonial vows; the person male or female, who had unnaturally fled from the calls of their parents; or the man who had deserted from his tribe. It is shewn, that fornicators, adulterers, and persons convicted of the crime of incest, were severely punished, each in proportion to the enormity of his offences. It is in like manner shewn, that bearing false witness, or the subornation of false witness, fraud of every description, falsehood, treachery, robbery, or murder, were crimes which deprived a prince of his right to govern, and subjected him to all the penalties, which, for similar crimes, were usually inflicted on persons of the lowest rank. And, to secure the impartial administration of justice, the law provided, that the judge who should be convicted of having pronounced an unjust decision should be stigmatized with a brand inflicted on his face.

On the whole, it is submitted, that there is sufficient evidence produced to prove that the ancient Irish laws dispensed impartial justice to all, that they encouraged genius and talent, punished vice and promoted virtue, and that, by the strict observance and impartial administration of those laws, the Irish people became so much in love with justice, as to compel even Sir John Davis to acknowledge, that “there is no nation of people under the sunne that doth love
 “equall and indifferent justice, better then the Irish; or will rest
 “better satisfied with the execution thereof, although it bee against
 “themselves; so as they may have the protection and benefit of
 “the lawe, when uppon just cause they do desire it.”*

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* Discovery of the true cause, &c. London 1747, page 283.





APPENDIX.

X. Alphabetical list of subjects, on which ancient Irish Laws are to be found amongst the Manuscripts in the Library of Trinity College, Dublin.

	Numbers in Class H.		Numbers in Class H.
Adultery	34, 53	Districts	54
Agreements	34, 53, 54	Dower	34, 53
Aireachs	54	Eneclans	54
Animals, &c.	53	Equity	53
Apparel	53, 54	Eric	34, 53
Arms	53, 54	Expulsion	54
Arson	54	Fairs	54
Bees	34, 54	Fals	34, 53, 54
Banishment	54	Family agreements and arrangements	53, 54
Biatachs	53	Fathers	53, 54
Bishops	54	Feasts	34
Bond feudists	34	Females, rights of	53
Bonds	54	Feuds or feudists	34, 53
Boundaries	54	Fines	53, 54
Brehons	54	Finès or tribes	34, 53, 54
Breithidh Neimhidh	54	Foreigners	54
Bridges	53	Forgiveness of crimes	53
Brothers	53, 54	Fornication	34, 53
Brughaidhs	53, 54	Fosterage and Fosterers	34, 53
Burnings	54	Fugitives	53
Cattle	34, 53, 54	Fuidhir or Feudists	34, 53, 54
Children	54	Gavels	53
Churches	53, 54	Gifts	53
Cities	53	Gold	34, 54
Clothes	53, 54	Grazing	53, 54
Clergy	53	Homicide	34, 53, 54
Contracts	34, 53, 54	Horses	54
Copper	34, 54	Hostages	53, 54
Crimes	53, 54	Hounds	54
Criminals	53	Hurling ..	54
Death feasts	34, 53	Incest	53
Debts	53, 54	Incendiaris	53
Debtors	53	Inheritance	53, 54
Dissolution of tribes	53	Joint-partners in land	54

	Number in Class H.		Number in Class H.
Judges	54	Punishments	54
Kings	54	Queen	53
Lands (under a variety of circum- stances)	34, 53, 54	Ranks, persons of different	53
Larceny	54	Rape	54
Lay-monks	34	Raths or villages	34, 53, 54
Leases	34	Redemption of pledges, hostages, &c.	54
Limbs, loss of	54	Regavelling of lands	53
Lepers	53	Resumption of lands	53
Loans	53	Rewards	53, 54
Maiming	54	Robbery	53, 54
Malt	34, 53	Sales of land, &c.	54
Manslaughter	53, 54	Seanchas mor	34, 53, 54
Marriage	53, 54	Securities	53, 54
Men	53, 54	Services	53
Metals	53	Sheep	54
Minors	34, 53	Ships	54
Monks	34	Silver	34, 54
Mortgages	53, 54	Slavery	34
Mothers	53	Sons	53, 54
Murder	53, 54	Succession to lands	53
Neimhidhs, superiors or nobles ...	54	Swine	54
Night, offences committed at ...	54	Theft	34, 53, 54
Nobles	54	Thieves	53
Obligations	53, 54	Timber	53, 54
Offences	53, 54	Transfer of lands	54
Partners in land	54	Treachery.....	54
Physicians	54	Trespases.....	34, 53, 54
Pledges	53, 54	Tribes.....	34, 53, 54
Plunder	53	Verbal agreements and contracts... ..	34, 53, 54
Poets, &c.	34, 54	Victuals and victuallers..... ..	53
Possessions	34, 53, 54	Villages.....	34, 53, 54
Prices of various articles	34	Virgins	53, 54
Princes and chiefs	53, 54	Warriors	54
Privileges	53, 54	Waste	54
Professors of arts and trades	54	Water	34, 54
Promises.....	53	Whoredom	54
Property, disposal or division of ...	53, 54	Witnesses	53
Prostitutes	54	Women	34, 53, 54
Protections	34, 53, 54	Wounds	54

A good copy of laws upon the principal part of the subjects mentioned in the above catalogue, formerly made for the Gaelic Society of Dublin, are now in the possession of Charles Patrick O'Neill, Esq. Post Office, Dublin. Another copy, and some ancient laws of considerable antiquity, written on vellum, are in the Library of the Royal Irish Academy. There are also some very ancient vellum manuscripts, containing some laws not mentioned in the foregoing catalogue, and some modern copies of laws on the principal subjects above-mentioned, in the collection of the author of this essay.

SUPPLEMENTARY NOTICES OF THE PLANTS AND MINERALS
OF THE ISLANDS OF ARRAN.

[*See Antiquities, p. 79.*]

Rare Plants observed in the largest Island of Arran, in October 1805. By James Townsend Mackay.

CORNUS sanguinea, Common Dogwood.

Cistus Helianthemum, Dwarf Rock Rose, or Sun Rose. The only place in Ireland where it has been found.

Lavatera arborea, Tree Mallow.

Humulus Lupulus, Common Hop.

This I was told had been introduced many years back. The plants I saw were most luxuriant, and extended their shoots to a great length, over the lime-stone rock, near to which they grew, and produced excellent Hops.

May not the plant Mr. O'Flaherty mentions, as having been used by the natives for dyeing blue, be the *Isatis tinctoria* or Dyer's Woad, which may have also been introduced and cultivated for use? I did not however observe it in the largest Island, which was the only one I visited.

The Woad is much used by the dyers in England for its blue colour, and it is the basis of many other colours. It is cultivated there for use; but is, even in England, rather rare in the wild state.

Rhodiola rosea, Rose-Root. The root in the wild state, when bruised, has the fragrance of a rose.

Polypodium vulgare. A beautiful variety of this fern is plentiful in Arran. It is readily distinguished from the common variety by having its fronds mostly bipinnatifid. The same variety grows in the Dargle.

Adiantum Capillus-Veneris. True Maiden-hair. This rare and most elegant fern, I found growing in the greatest profusion in the crevices of the lime-stone rock, of which the greater part of the surface of the island is composed. It is the only place in Britain or Ireland where it has been found of late.

Mineralogy of the Islands of Arran, as collected from a few specimens in the Museum of the Royal Dublin Society.

THE Islands of Arran consist mostly of grey and greyish-black Lime-stone of different descriptions: it is partly compact, partly granular. The compact contains some petrifications, particularly Chamites, Cochlites, and Anomites. Some part of this Lime-stone is of a slaty texture. In some large blocks along the shore, which have the appearance of reddish-grey conglomerats, there are imbedded small imperfect Madreporites. Some parts of the greyish-black Lime-stone is bituminous, and emits a strong hepatic smell, when struck with a hammer. This kind is sometimes decomposed on its surface, and passes into calcareous Marl-slate. It contains, but rarely, common pyrites, partly in grains, partly in cubes. Some of these compact Lime-stones, particularly those of greyish-black colour take, a very fine polish.

Fine granular Green-stone is also found in very large masses, generally iron-shot on its surface, and decomposed: it forms a yellowish-brown Iron-ochre.

Nodules and Boulders of common Iron-pyrites, of a pale brass-yellow colour, are found imbedded in compact greyish-black Lime-stone, and loose.

Meadow Iron-ore, of a yellowish-brown and ochre-yellow colour, is found in loose pieces.

Blue Iron-earth, or blue Phosphate of Iron of pulverulent particles, occurs in Turf-land, but rarely.



