# PHILOSOPHICAL TRANSACTIONS.

XVI. *An abridged State of the Weather at* London *in the Year* 1774, *collected from the Meteorological Journal of the* Royal Society. *By* S. Horsley, *LL.D. Sec. R. S.*

ALTHOUGH the practice of keeping meteorological journals is, of late years, become very general, no information of any importance hath yet been derived from it. The reason of which perhaps may be, that after great pains and attention bestowed in registering particulars, as they occur, with a scrupulous minuteness, observers have not taken the trouble to form, at proper intervals of time, compendious abstracts of their records, exhibiting the general result of their observations in each distinct branch of meteorology. The following tables are given as an example of the method that may be taken in future to remedy this neglect. With the general state of the barometer and thermometer, already given at the end of the meteorological journal, they form a history of the weather at London during the last year. If the example were to be followed, in different parts of the kingdom, we might in time be furnished with an experimental history of the weather of our island.

TABLE I.

An abridged View of the WINDS at LONDON, in the Year 1774, Compiled from the Meteorological Journal of the Royal Society.

| | N | S | E | W | NW | SE | NE | SW | | Rain. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 1½ | 0 | 2 | 1½ | 4 | 2½ | 4 | 13 | 31 | 2,958 | Five half-days omitted in the Journal. |
| February | 1 | 1½ | 1 | 3 | 2 | 0 | 3½ | 16 | 28 | 2,360 | |
| March | 2 | 1½ | 1 | 1 | ½ | 3 | 14 | 7½ | 31 | 1,780 | Half of a day missed in the Journal. |
| April | 2½ | 3 | 2 | 4½ | 2½ | 2 | 5 | 8½ | 30 | 1,242 | |
| May | 3 | ½ | 3½ | 0 | 6 | 3 | 10½ | 4 | 31 | 1,413 | An half-day missed in the Journal. |
| June | ½ | 3½ | 2½ | 2½ | 4 | 2 | 1½ | 13½ | 30 | 2,273 | |
| July | ½ | 2 | 0 | 1 | 6½ | 2 | 1 | 18 | 31 | 2,438 | |
| Auguſt | 2 | 1½ | 0 | 1½ | 2 | 4 | 6 | 14 | 31 | 3,340 | |
| Septemb. | 1½ | 2½ | 1 | 2½ | 4 | 3½ | 6 | 9 | 30 | 3,917 | |
| October | 1 | 2½ | 1 | 2 | 3½ | 3 | 8 | 10 | 31 | 1,215 | |
| Novemb. | 7 | 1 | 1½ | 0 | 2½ | 1½ | 7 | 9½ | 30 | 1,586 | |
| December | 2½ | 1½ | 2 | 4½ | 6 | 3½ | 7½ | 3½ | 31 | 1,806 | |
| | 25 | 21 | 17½ | 24 | 43½ | 30 | 74 | 126½ | | 26,328 | |

This table ſhews the number of days that each wind blew in each month, dividing the compaſs only into eight points, and reckoning all the winds between N. and W., N.W.; all between S. and E., S.E; all between N. and E., N.E.; and all between S. and W., S.W. The number of days that each blew in all the months being collected into one ſum at bottom, ſhews the number of days each wind blew in the whole year. The quantity of rain that fell in each month is added, that the connection between wet and dry, and the ſeveral winds may

the more readily appear. It appears that the winds from the S.W. prevailed more than any other in the year 1774; and next to the S.W. the N.E. But the S.W. was more frequent than the N.E. in the proportion of 126 to 74. Of the winds from the four cardinal points the North was the moſt frequent, and the Eaſt the moſt rare. In the three ſummer months, June, July, and Auguſt, there fell more rain than in the three of any other ſeaſon. Of the 26,328 inches of rain which fell in the whole year, 13,842 fell in the winter half-year, conſiſting of the ſix months of September, October, November, December, January, and February, and 12,486 in the ſummer half-year, conſiſting of the ſix months of March, April, May, June, July, and Auguſt. So that the winter's rain exceeded the ſummer's by 1,356 inch; that is, by little more than $\frac{1}{10}$th part of half the rain of the whole year. September gave the greateſt quantity of rain, and October the leaſt of any ſingle month in the whole year.

In collecting the rain of the ſeveral months, my rule, with reſpect to what hath ſometimes fallen in the night between the laſt day of one month and the firſt of the next following, hath been this. When it appears by the journal, that it was fair on the laſt day of the month, at the time of the afternoon obſervations, I have given the whole of the enſuing night's rain to the new month; but if it rained on the laſt day of the month, at the time of the afternoon obſervation, I have divided the night's

rain equally between the new month and the old one. For inſtance, it appears by the journal that 0,043 fell in the night between the laſt day of February and the firſt of March. The whole of this I have placed to the account of March; becauſe it was fair at the time of the afternoon obſervation on the laſt day of February. Again, in the night between the laſt day of September and the firſt of October, there fell 0,347. Half of this I give to September's rain and half to October's; becauſe it rained the laſt day of September at the time of the afternoon obſervation.

TABLE II.

| Sub-diviſion of the S.W. | WSW | SW | SSW | |
|---|---|---|---|---|
| January | 2 | 9½ | 1½ | 13 |
| February | 4 | 7½ | 4½ | 16 |
| March | 1½ | 4½ | 1½ | 7½ |
| April | 3 | 3 | 2½ | 8½ |
| May | ½ | 2 | 1½ | 4 |
| June | 1 | 9 | 3½ | 13½ |
| July | 5 | 9 | 4 | 18 |
| Auguſt | 5½ | 4½ | 4 | 14 |
| September | 2 | 1½ | 5½ | 9 |
| October | 2 | 5 | 3 | 10 |
| November | 2½ | 5 | 2 | 9½ |
| December | 1 | 2 | ½ | 3½ |
| | 30 | 62½ | 34 | 126½ |

TABLE III.

| Sub-diviſion of the N.E. | ENE | NE | NNE | |
|---|---|---|---|---|
| January | 2½ | ½ | 1 | 4 |
| February | 0 | 2½ | 1 | 3½ |
| March | 2½ | 9 | 2½ | 14 |
| April | ½ | 3½ | 1 | 5 |
| May | 2 | 8½ | 0 | 10½ |
| June | 0 | ½ | 1 | 1½ |
| July | 0 | ½ | ½ | 1 |
| Auguſt | 2 | 1 | 3 | 6 |
| September | 1 | 1 | 4 | 6 |
| October | 2½ | 3½ | 2 | 8 |
| November | 4 | 1½ | 1½ | 7 |
| December | 1½ | 3½ | 2½ | 7½ |
| | 18½ | 35½ | 20 | 74 |

In theſe two tables the winds between the W. and the S.W. are all ſet down to the W.S.W.; and thoſe between the S. and the S.W. are all reckoned S.S.W. In like manner,

ner, the winds between the E. and N.E. are all reckoned E.N.E.; and thoſe between the N. and N.E. are all reckoned N.N.E. It appears that of the winds between the S. and W. thoſe from the point of S.W. were far more frequent than thoſe from either ſide of it. And the winds from the point of N. E. more frequent than thoſe on either ſide of it, nearly in the ſame proportion.

TABLE IV.

| Sub-diviſion of the S.E. | | | | |
|---|---|---|---|---|
| | ESE | SE | SSE | |
| January | 1½ | 1 | 0 | 2½ |
| February | 0 | 0 | 0 | 0 |
| March | ½ | 1½ | 1 | 3 |
| April | 0 | 1 | 1 | 2 |
| May | 0 | 0 | 3 | 3 |
| June | 0 | 1½ | ½ | 2 |
| July | ½ | 0 | 1½ | 2 |
| Auguſt | 1 | 2½ | ½ | 4 |
| September | 0 | 1½ | 2 | 3½ |
| October | ½ | 1½ | 1 | 3 |
| November | 0 | 1 | ½ | 1½ |
| December | 0 | 2½ | 1 | 3½ |
| | 4 | 14 | 12 | 30 |

TABLE V.

| Sub-diviſion of the N.W. | | | | |
|---|---|---|---|---|
| | WNW | NW | NNW | |
| January | ½ | 2½ | 1 | 4 |
| February | 1 | 1 | 0 | 2 |
| March | 0 | ½ | 0 | ½ |
| April | ½ | 1½ | ½ | 2½ |
| May | ½ | 3½ | 2 | 6 |
| June | 1½ | 1½ | 1 | 4 |
| July | 2 | 4½ | 0 | 6½ |
| Auguſt | 0 | 1½ | ½ | 2 |
| September | 2 | 1 | 1 | 4 |
| October | 0 | 3½ | 0 | 3½ |
| November | 1 | ½ | 1 | 2½ |
| December | 2½ | 3½ | 0 | 6 |
| | 11½ | 25 | 7 | 43½ |

By theſe two tables it appears, that of all the winds between the N. and W. thoſe from the point of N.W. were far more frequent than thoſe from either ſide of it. Of the winds between the S. and E. thoſe from the point of S.E. were more frequent than thoſe to the E. of that point, and rather more frequent than thoſe to the S. of it;

it; but the difference in the latter caſe was very inconſiderable. Of the winds from all quarters, thoſe from the E.S.E and N.N.W. were the moſt rare, eſpecially the former. The numbers in the laſt columns of each of the four laſt tables are the ſums of the preceding columns ranging in the ſame horizontal lines. They ought to correſpond with the numbers in columns S.W. N.E. S.E. N.W. of TABLE I. reſpectively, and ſerve as a check upon the work in making the tables.

The general ſtate of the winds collected from the five preceding tables, according to their different degrees of prevalence, is as follows:

| ESE | NNW | WNW | SSE | SE | E | ENE | NNE | S | W | NW | N | WSW | SSW | NE | SW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 7 | 11½ | 12 | 14 | 17½ | 18½ | 20 | 21 | 24 | 25 | 25 | 30 | 34 | 35½ | 62½ | 361½ |

Days miſſed in the Journal, - - - - - 3½

365

TABLE VI.

Shewing the number of fair and frosty days in each half month and in the whole year.

| | Fair | | Fair days in whole month. | Frosty days | | Frosty days in whole month. |
|---|---|---|---|---|---|---|
| | 1st half. | Latter half. | | 1st half. | Latter half. | |
| January | 9 | 6 | 15 | 10 | 7 | 17 |
| February | 7 | 3 | 10 | 6 | | 6 |
| March | 7 | 13 | 20 | 4 | | 4 |
| April | 11 | 8 | 19 | | | |
| May | 8 | 6 | 14 | | | |
| June | 10 | 6 | 16 | | | |
| July | 6 | 8 | 14 | | | |
| Auguſt | 9 | 8 | 17 | | | |
| September | 7 | 2 | 9 | | | |
| October | 12 | 10 | 22 | | | |
| Novemb. | 5 | 6 | 11 | | 1 | 1 |
| December | 6 | 13 | 19 | 5 | 3 | 8 |
| Total fair days, | | | 186 | Total froſt, | | 36 |

There were but 10 days in the whole year that gave any ſnow; *viz.* 3 in January, 1 in February, 5 in November, and 1 in December. The firſt ſnow on the 9th of January in the afternoon, after a rainy morning, ſet in with a N.N.E. wind, and was ſucceeded by a ſharp froſt for three days and a half, with the wind E.N.E. The ſecond, which happened in the night between the ſeventeenth and eighteenth, came likewiſe after rain, and was ſucceeded by a froſt of four days and a half, wind ſhifting between N.W. and S.E. The laſt ſnow in January, on the 24th, fell with a S.W. wind, which ſet in the day before. It was followed by a moderate froſt of one

one day, though the wind continued in the S.W. The ſnow on the 1ſt of February came with a S.W. during a ſharp froſt. The wind was in the N.E. before the ſnow, and returned to the ſame point the next morning; the froſt ſharper than before the ſnow. The ſnows in the latter part of November were generally accompanied with rain, and did not bring actual froſt. The ſnow on the 9th of December came after two days froſt, which it ſeems to have put an end to. For though it froze in the evening after the ſnow, the froſt was much leſs ſevere than the preceding night, and a thaw came with rain, wind N.E., the next day.

There were only two thunder ſtorms this year, *videlicet*,

Auguſt 27. 2 P.M. Barometer 29,64 inches, Thermometer 63°, Wind N.W.

September 24. 9 P.M. Barometer 29,42 inches, Thermometer at 2 P.M. 64°.

# TABLE VII.

For Trial of the Influence of the WINDS upon the BAROMETER.

| | SW | WSW | SSW | NE | ENE | NNE | SE | ESE | SSE | NW | WNW | NNW | N | S | E | W |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan. | 29.37 | 29,61 | 29,60 | 29,34 | 29,64 | 29,58 | 29,57 | 29,72 | | 29,66 | 29,895 | 29,675 | 29,72 | | 29,80 | 29,67 |
| Feb. | 29,63 | 29,81 | 29,70 | 30,30 | | 30,41 | | | | 29,73 | 29,615 | | 29,69 | 29,86 | 29,85 | 29,90 |
| Mar. | 29,39 | 29,79 | 29,89 | 29,945 | 29,87 | 30,20 | 29,52 | 29,88 | 29,52 | 29,615 | | | 30,14 | 29,87 | 29,90 | 29,75 |
| April | 29,77 | 30,07 | 29,61 | 29,95 | 30,21 | 29,80 | 30,00 | | 29,69 | 29,80 | 29,58 | 29,90 | 29,82 | 29,475 | 29,53 | 29,80 |
| May | 29,91 | 29,46 | 29,45 | 29,96 | 29,86 | | | | 29,71 | 29,81 | 29,97 | 30,04 | 29,98 | 29,34 | 29,925 | |
| June | 29,91 | 29,92 | 29,80 | 30,21 | | 29,75 | 29,92 | | 29,95 | 30,00 | 29,69 | 29,87 | 29,60 | 29,83 | 29,84 | 30,09 |
| July | 29,97 | 29,97 | 29,98 | 29,92 | | 30,33 | | 29,78 | 29,97 | 30,07 | 30,085 | | 30,26 | 30,25 | | 29,94 |
| Aug. | 29,97 | 29,85 | 29,80 | 29,95 | 30,00 | 30,17 | 30,05 | 30,07 | 29,535 | 29,960 | | 30,12 | 30,13 | 29,74 | | 29,98 |
| Sept. | 29,89 | 29,80 | 29,70 | 29,97 | 29,82 | 29,94 | 29,51 | | 29,56 | 29,925 | 29,82 | 29,94 | 29,85 | 29,64 | 29,775 | 29,76 |
| Oct. | 29,98 | 30,28 | 30,225 | 30,32 | 29,865 | 30,23 | 30,15 | 29,54 | 30,18 | 29,98 | | | 30,19 | 30,22 | 29,95 | 30,27 |
| Nov. | 29,74 | 29,91 | 29,92 | 29,79 | 29,73 | 29,53 | 29,84 | | 29,86 | 29,81 | 29,74 | 29,90 | 29,93 | 29,61 | 29,54 | |
| Dec. | 30,07 | 29,795 | 29,71 | 30,15 | 29,82 | 30,38 | 29,62 | | 29,20 | 30,21 | 30,31 | | 30,38 | 29,64 | 29,90 | 30,51 |
| Means | 29,76 | 29,92 | 29,80 | 30,02 | 29,82 | 30,01 | 29,80 | 29,81 | 29,70 | 29,94 | 29,93 | 29,92 | 29,99 | 29,80 | 29,80 | 30,02 |

It is an old obſervation, that a N.E. wind in this country generally makes the barometer riſe. This naturally leads to an enquiry, whether there be any general connection of the riſe and fall of the barometer with the ſetting of the wind. Upon comparing the general account of the barometer for the year 1774, as ſtated at the end of the meteorological journal, with the journal at large, I found, that in ſeven months out of the twelve the greateſt height of the barometer was accompanied with a North-eaſterly wind; and in eight months out of the twelve, the leaſt height of the barometer was accompanied with a S.W. This incited me to take the trouble of making out the preceding table, which ſhews the mean height of the barometer which accompanied each wind in every month, and for the whole year. And it appears, that though the barometer may be almoſt at any height with any wind, yet the mean height was greater, in the courſe of the laſt year, with the winds which ſet from that ſemicircle of the compaſs, which is intercepted between the points of W.S.W. incluſive and E.N.E. excluſive, going round by the W. and N. than with the winds which ſet from the oppoſite ſemi-circle intercepted between E.N.E. incluſive and W.S.W. excluſive, going round by E. and S. In the former ſemi-circle the W. and N.E. give the greateſt mean height, and in the latter the S.S.E. and S.W. give the leaſt*.

* It is to be noted, that the means of the whole year, ſtated in the lowermoſt horizontal row, are not found by collecting the means of all the months into one ſum, and dividing by the number of months (for this method would always be fallacious, except each wind had blown for the ſame number of days in all the different months); but by adding together the heights attending each wind day by day, and dividing the ſum by the number of days each wind blew in the whole year.

## TABLE VIII.

### For Trial of the MOON's Influence.

| | Laſt Qr. | New. | Firſt Qr. | Full. | |
|---|---|---|---|---|---|
| | D. H. | D. H. | D. H. | D. H. | |
| Jan. | 5 6 | 11 21 | 19 3 | 27 7 | ♒ ☉ ♓ ✶ ☉ ♓ ☉ ♓ ☉ ♒ ♓ ☉ 6 7 9 10 14 18 23 25 26 30 |
| Feb. | 3 15 | 10 9 | 18 0 | 25 23 | ♒ ♓ ☉ ♒ ☉ ☉ 4 7 8 10 13 15 17 20 |
| Mar. | 4 22 | 11 22 | 19 20 | 27 11 | ☉ 10 |
| Apr. | 3 5 | 10 12 | 18 15 | 25 22 | ♒ ☉ ♒ ☉ 4 8 28 29 |
| May | 2 12 | 10 3 | 18 7 | 25 5 Laſt Qr. 31 20 | ♒ ☉ ♒ 5 7 23 |
| | New. | Firſt Qr. | Full. | Laſt Qr. | |
| June | 8 18 | 16 19 | 23 12 | 30 7 | ☉ ♒ ☉ ♒ ☉ ♒ ☉ 6 17 18 20 22 28 30 |
| July | 8 9 | 16 5 | 22 19 | 29 20 | ♒ ☉ ♒ ☉ ♓ ☉ 5 15 20 22 27 31 |
| Aug. | 7 0 | 14 12 | 21 3 | 28 12 | ♒ ☉ ☉ ♒ ♒ ☉ ♒ 4 6 11 15 17 26 |
| Sept. | 5 14 | 12 17 | 19 13 | 27 7 | ☉ ♒ ☉ ♒ ☉ ♓ ☉ ♒ ☉ ♒ 1 5 7 11 13 14 17 20 22 |
| Oct. | 5 3 | 12 0 | 19 2 | 27 3 | ☉ ☉ ♒ ☉ 3 23 24 29 |
| Nov. | 3 15 | 10 7 | 17 18 | 25 23 | ☉ ♒ ☉ ♒ ♓ ✶ ☉ 2 6 7 18 21 26 |
| Dec. | 3 2 | 9 17 | 17 12 | 25 17 | ♒ ☉ ☉ ♒ ♒ ☉ 2 5 11 14 15 |

This table exhibits a compariſon of the actual changes of the weather from fair to foul, with the aſpects of the Moon; and needs no other explanation than an interpretation of the characters in the laſt column.

— froſt
+ thaw
o fair
~ rainy
≈ ſtormy
* ſnow

Any one of theſe marks placed over a number ſignifies, that the weather indicated by that mark continued from the day of the month denoted by the number underneath to the day denoted by the next following number, bearing ſome other mark over it. Thus, in the month of July, rainy weather ſet in on the fifth, and laſted to the fifteenth; from the 15th to the 20th it was fine; when it changed again, and continued rainy till the 22d; then it was fine to the 27th, and rainy again till the 31ſt.

Such tables of compariſon, made yearly for a ſucceſſion of years, would in the end decide with certainty for or againſt the popular perſuaſion of the Moon's influence upon the changes of our weather; which hath ſome how or other gained credit even among the learned, without that ſtrict empiric examination, which a notion in itſelf ſo improbable, ſo deſtitute of all foundation in phyſical theory, ſo little ſupported by any plauſible analogy, ought to undergo. The vulgar doctrine about this influence is, that it is exerted at the ſyzygies and quadratures, and for three days before and after each of thoſe epochs. There are 24 days therefore in each ſynodic month, over which the Moon at this rate is ſuppoſed to preſide; and as the whole conſiſts but of 29 days 12$\frac{3}{4}$ hours,

hours, only $5\frac{1}{2}$ days are exempt from her pretended dominion. Hence, though the changes of the weather ſhould happen to have no connection whatever with the Moon's aſpects, though the fact ſhould be, that they take place at all times of the Moon indifferently, and are diſtributed in an equal proportion through the whole ſynodic month; yet any one who ſhall predict, that a change ſhall happen on ſome one of the 24 days aſſigned, rather than on any one of the remaining $5\frac{1}{2}$, will always have the chances 24 to $5\frac{1}{2}$ in his favour. Merely becauſe more changes will fall with in the greater time, and, upon an average, as many more in proportion as the time is greater. It is evident therefore, that this is a matter in which men may eaſily deceive themſelves, eſpecially in ſo unſettled a climate as that of this iſland: and the advocates for lunar influence are not to imagine they have fact on their ſide, unleſs it ſhould appear, from ſuch tables as theſe carefully kept for a long courſe of years, that the changes happening on the days, which they hold to be ſubject to the Moon, are more than thoſe which happen on the exempted days, in a much greater proportion than that of 24 to $5\frac{1}{2}$.

The antiquity of the opinion may perhaps be alledged in its favour; and it may ſeem an anſwer to the objection taken from the inſtability of the weather of this part of the world, that it had its origin in more ſettled climates. We find it, it muſt be confeſſed, in the earlieſt Greek writers, who probably had it with the reſt of their phyſics from the Eaſt. And to this circumſtance, I

am perſwaded, the opinion owes the credit it hath met with among men of learning. But whatever general aſſertions may be found in ſome writers, concerning celeſtial influences in general, and the Moon's in particular, as being of all the heavenly bodies the neareſt to the earth, the writers who treat of the ſigns of the weather practically, for the information of huſbandmen and mariners, derive their prognoſtics from circumſtances, which neither argue any real influence of the Moon as a cauſe, nor any belief of ſuch an influence; but are merely indications of the ſtate of the air at the time of obſervation: namely, the ſhape of the horns, the degree and colour of the light, and the number and quality of the luminous circles which ſometimes ſurround the Moon, and the circumſtances attending their diſappearance (a). It is true, that each of theſe prognoſtics is expreſsly confined, by the early writers, to a particular time of the Moon's age (b). But not, as I conceive, on account of any particular influence of the Moon in this or that aſpect; but merely becauſe the prognoſtics, that ſhe affords at one age, are ſuch in themſelves as ſhe cannot afford at another. For inſtance, the bluntneſs of the horns in the new Moon is a ſign of approaching rain,

(a) See the Διοσημεια of Aratus and the Scholia of Theon.

(b) Σήμαῖα δ' ὅτ' ἄρ' πᾶσιν ἐπ' ἤμασι παύλα τέτυκται.
Ἀλλ' ὅσα μὲν τριλάτῃ τετραταίῃ τε πέλῃται,
Μέσφα διχαιομένης· διχάδος γέ μεν ἄχρις ἐπ' αὐτὴν
Σημαίνει διχόμηνον· αὐτὰρ πάλιν ἐκ διχομήνης
Ἐς διχάδα φθιμένην· ἔχεται δέ οἱ αὐτίκα τέρας
Μηνὸς ἀποιχομένου. Arat. Διοσημεια.

becauſe

becauſe it indicates a turbid ſtate of the atmoſphere; for if the air were clear and dry, the horns ſhould appear ſharp and pointed, that being then their natural ſhape. But the bluntneſs of the horns is no ſign of change after the dichotomy; becauſe then the horns will appear blunt in all ſtates of the air, the elliptic arc on the deficient ſide of the Moon preſenting its concavity to the circular limb, and forming with it an obtuſe angle. Again, the degree of the Moon's light on the fourth day furniſhed a prognoſtic. It ought then to be ſtrong enough, if the air was clear, for terreſtrial objects to caſt a ſhadow (c). If their ſhadows were not diſcernible, it was a ſign that the air was impure, and bad weather was to be expected. But this prognoſtic did not take place *before* the fourth day, becauſe the light of the Moon was yet too weak for ſhadows to be formed in the pureſt ſtate of the air. It did not take place *after* the fourth day, becauſe the enlightened part was then ſo much encreaſed, that ſhadows would be formed in any ſtate of the air, if the Moon was not actually hidden by a cloud, or obſcured by ſenſible miſts. The prognoſtics furniſhed by the new Moon ſerved only till the dichotomy, and thoſe of the dichotomy till the full Moon, and ſo on; not becauſe a new and diſtinct influence was exerted in each new aſpect, but becauſe each new aſpect furniſhed a new ſet of ſigns, of a

(c) ——ὅτε πρώτη ἀποσκίδναλαι αὐτόθεν αὐγὴ
Ὅσσον ἐπισκιάειν ἐπὶ τέτραλον ἦμαρ ἴσσα. Αρατ. Διοσημεια.

Τέλαλαία γενομένη ἡ σελήνη ἀρχέλαι δύνασθαι σκιάζειν ἐν τῷ φωλὶ αὐτῆς· τριταίᾳ γὰρ ἃ ἐύναται διὰ τὴν περικειμένην τῇ φωλίς ἀδράνειαν. Theon in locum.

different

different kind. That this is a true repreſentation of the moſt ancient lunar prognoſtics, appears from hence; that others of a ſimilar kind were derived from the Sun and the fixed ſtars, particularly the *Præſepe and Aſelli* in Cancer, and the bright ſtar in the Altar.; and it is remarkable, that ARATUS ſays, the prognoſtics taken from the Sun are the moſt certain of all (d). The vulgar ſoon began to conſider thoſe things as cauſes, which had been propoſed to them only as ſigns. The manifeſt effect of the Moon upon the Ocean, while the mechanical cauſe of it was totally unknown, was interpreted as an argument of her influence over all terreſtrial things; and theſe notions were ſo conſiſtent with that viſionary philoſophy, which aſſigned diſtinct places to corruption, change, and paſſivity, on the one ſide, and the active governing powers of nature on the other, and made the orb of the Moon the boundary between the two, that they who ſhould have been its opponents, ranged themſelves on the ſide of popular prejudice. And the uncertain concluſions of an ill-conducted analogy, and a falſe metaphyſic, were mixed with the few ſimple precepts derived from obſervation, which probably made the whole of the ſcience of prognoſtication in its earlieſt and pureſt ſtate. Hence both THEOPHRASTUS and ARATUS teach us to remark the poſition of the Moon's horns, and take conjectures of approaching fair weather or tempeſt, according as they appear, at different times of the Moon's age, erect, reclined, or prone: not knowing

(d) Ηελίῳ δ' μᾶλλον ἐοικότα σήματα κεῖται. Διοσημεια.

that

that the poſition of the line joining the Moon's cuſps, with reſpect to the horizon, depends merely upon the mutual approach, or receſs, of the pole of a great circle drawn through the centers of the Sun and Moon, and the pole of the horizon, in the courſe of the diurnal revolution. And ſo great a man as VARRO, as he is quoted by PLINY, was not aſhamed to give this childiſh rule, for predicting the weather, for a whole month to come, from appearances at the new Moon. "If the upper horn "be obſcure, the decline of the Moon will bring rain. "If the lower horn, the rain will happen before the full. "At the time of the full Moon, if the blackneſs be in "the middle(e)." After this one cannot be ſurprized, that the poet VIRGIL ſhould make the prognoſtics of the fourth day deciſive for the whole lunation:

*Sin ortu quarto, namque is certiſſimus auctor,*
*Pura neque obtuſis per cœlum cornibus ibit,*
*Totus et ille dies, et qui naſcentur ab illo,*
*Exactum ad menſem pluviâ ventiſque carebunt.*

Georgic. lib. 1. lin. 143.

But in this he contradicts ARATUS, whoſe authority in general he follows implicitly. With ARATUS, the ſigns of the new Moon extend only to the firſt quarter.

The ancients aſcribed an influence to the conſtellations and fixed ſtars as well as to the Sun and Moon; and

(e) Apud Varronem ita eſt.——— Naſcens Luna ſi cornu ſuperiore obatro ſurget, pluvias decreſcens dabit: ſi inferiore, ante pleniłunium: ſi in mediâ nigritia illa fuerit, imbrem in pleno. PLIN. Nat. Hiſt. lib. XVIII. cap. 35.

there ſeems to have been much the ſame foundation for one as the other. In the *parapegmata* or calendars, introduced in Greece, as we learn from THEON (*f*), by the aſtronomer METON, and renewed either annually or, as I rather conjecture, at the expiration of every 19-year period, the heliacal riſings and ſettings of different ſtars were marked as bringing in different ſorts of weather. The truth is, the earlieſt aſtronomers imagined, that the weather was governed by the Sun; and that its varieties were every where owing to the different degrees of the Sun's heat in the different ſeaſons. They had therefore taken great pains to collect, by a long ſeries of obſervations, the weather that uſually prevailed in this or that particular place during the Sun's paſſage through every degree of every ſign. Upon theſe obſervations, not upon any whimſical theory of celeſtial influences, the predictions in the calendars were founded. It ſeemed reaſonable to announce, as the weather of each part of the year, what had been found to be then moſt frequent. And while the civil reckonings of time were ſo different among the different Greek ſtates, and ſo rudely digeſted in all, the heliacal riſings and ſettings of the ſtars were the only certain and obvious marks, the compilers of thoſe popular directories could hit upon, of the Sun's return to the different parts of the zodiac (*g*). Hence they propoſed them

(*f*) Scholia in Aratum.

(*g*) Geminus. Εἰσαγωγὴ εἰς τὰ φαινόμενα. c. 14.

to

to the people as ſignals of the weather to be expected. The form of the year being now the ſame in all parts of Europe, and pretty accurately adjuſted to the motions of the heavenly bodies, and the heliacal riſings and ſettings of the ſtars, from the different manner of life of our country people, not falling ſo much under popular obſervation with us, as they did among the Greeks, they are not marked as prognoſtics in our modern almanacks: and this I take to be the reaſon, that though the Moon hath maintained her reputation amongſt us, the influence of the fixed ſtars is ſunk, as it well deſerves, in utter oblivion. Upon the whole I do not deny, that the obſervant huſbandman will find a variety of uſeful prognoſtics in the appearances of the Moon, and the heavenly bodies in general; but they will be prognoſtics of no other kind, and for no other reaſon (though perhaps leſs fallible) than the ſputtering of the oil in the induſtrious maiden's lamp, or the excreſcences which gather round the wick (b). They will be ſymptoms deſtitute of all efficient powers. They will ſhew the preſent ſtate of the air, as that on which they depend, not as that which they

(b) Ne nocturna quidem carpentes penſa puellæ
Neſcivere hiemem: teſtâ cum ardente viderent
Scintillare oleum, et putris concreſcere fungos.
Georgic. lib. I. lin. 390.

Ἢ λύχνοιο μύκητες ἀγειρώνται περὶ μυῶπα,
Νύκτα καὶ ἀ σκοτίην, μηδ' ἢν ὑπὸ χείματος ὥρῃ
Λύχναν ἄλλοτε μέν τε φάος καὶ κόσμον ὁρώρῃ,
Ἄλλοτε δ' αἰσσωσιν ἀπὸ φλόγες, ἠύτε κῦφαι
Πομφόλυγες &c. Αρατ. Διοσημ.

 govern,

govern, and may furniſh probable conjectures for two or three days to come. To what I have already advanced in ſupport of this opinion, I ſhall only add the laſt lines of the Διοσημεια of ARATUS. They ſpeak the ſentiments of the earlieſt ages moſt deciſively, as they ſhew how little the doctrine of the influence of lunar aſpect had gained ground, even in his days, among practical writers. That elegant verſifier, there is little room to doubt, delivers the practical maxims of his time, juſt as he received them. He was too little of a poet to diſguiſe the truth with ornamental fiction, and too little of a philoſopher to adulterate it with hypotheſis.

Τῶν μηδὲν καλόκνησο, καλὸν δ' ἐπὶ σήματι σῆμα
Σκέπτεσθαι, μᾶλλον δὲ δυοῖν εἰς ταυτὸν ἰόντοιν
Ἐλπωρὴ τελέθοι· τριάτῳ δέ κε θαρσησείας.
Αἰεὶ δ' ἂν περιόντος ἀριθμοίης ἐνιαυτὸν
Σήματα, συμβάλλων εἴπερ κ' ἐπ' ἀξέρι τοίῃ
Ἥως ἀντέλλοντι καὶ ἐρχεται, ἢ καὶ ἰόντι,
Ὁπποῖον κ' σῆμα λέγοι· μάλα δ' ἄρκιον εἴη
Φράζεσθαι φθίνοντος, ἐφισαμένοιό τε μηνὸς
Τεταράδας ἀμφοτέρας· αἱ γάρ τ' ἄμυδις συνιόντων
Μηνῶν πειρατ' ἔχουσιν, ὅτε σφαλερώταλος αἰθὴρ
Ὁκτὼ νυξὶ πέλει, χήτεϊ χαροποῖο σελήνης.
Τῶν ἄμυδις πάντων ἐσκεμμένος εἰς ἐνιαυτὸν,
Οὐδέποτε σχεδίως κεν ἐπ' αἰθέρι τεκμήραιο.

Which

Which I render thus: " Neglect none of theſe prog-
" noſtics [none, he means, of the great variety he hath
" enumerated, taken from the heavens, from animals,
" plants, terreſtrial objects, &c.], it is a good thing to com-
" bine the obſervation of one prognoſtic with another. If
" two agree, there is the greater likelihood of the event,
" and a third makes it certain. Whatever you do, regiſter
" [ἀριθμοίης] the prognoſtics of the current year, care-
" fully noting what the prognoſtic ſays [ὁπποῖον κε σῆμα
" λέγοι; that is, what the event ſhew it to be a ſign of],
" if ſuch a ſort of morning (i) comes on with the riſe or
" ſetting of any particular ſtar. And it will be of the

(i) *Such a ſort of morning.* That is, a morning marked with ſuch or ſuch appearances. So I underſtand τοίη ἠὼς. The ſpirit of the precept ſeems to be, that the heliacal riſings of the ſtars are to be attended to, in conjunction with the particular appearances attending the dawn or ſun-riſe. The heliacal riſings ſhew the ſeaſon, or general conſtitution of the time of the year; the particular appearances of the morning indicate the minute circumſtances of the weather for two or three days to come. Thus the heliacal riſing of Arcturus was a ſign, in all the ancient parapegms, that the ſtormy ſeaſon was at hand, and bad weather of various ſorts, rain, thunder, high wind, was to be expected; but what the particular weather would be for a day or two to come, whether it would be only windy, or wet, with thunder or without, from what quarter the bad weather would come, all this would be pre-ſignified by the particular appearances of the morning. Perhaps the ſame appearance may be ſubject to ſome variety of interpretation at different ſeaſons of the year, and in different places. In this, experience and obſervation will be the only ſure guides. And for this reaſon ARATUS adviſes his ſcholar, not only to attend to the general rules laid down for him, but to keep a journal for himſelf, and make his own concluſions.

" higheſt importance to attend particularly to the two
" quaternions of the expiring and the incipient month(k)
" [that is to the four laſt days of the month going out,
" and the four firſt of that which is ſetting in], for they
" compriſe the extremities of the two months, where
" they meet: and the weather [or the ſtate of the air]
" is then particularly uncertain [difficult to gueſs at] for
" eight nights, for want of the ſilver-coloured Moon.
" If you attend to all theſe put together, all through the
" year, you will never form a random gueſs about the
" weather." The uncertainty of the weather for theſe eight nights cannot be an uncertainty of the effect depending upon the moon's aſpect; but it is an uncertainty of fore-knowledge, the poet ſpeaks of, for want of the Moon as an index. For though the word σφαλερώτατος by itſelf would be ambiguous, as it might be taken either in the ſenſe of δυσόχασος or εὐμελάβληος, the words χήτεϊ χαροποῖο σελήνης are deciſive for the firſt interpretation. The moon exiſts during theſe eight months as at other times. There is no want of her therefore as a phyſical agent: the only want there can be, is the want of her

(k) *And it will be of the higheſt importance to attend to*, &c. μάλα δ' ἄρκιον εἶη φράζεσθαι. I have ſometimes thought theſe words might be rendered thus: " This will be of great importance [that is, this joint obſervation of the general " indications of ſeaſon and of particular prognoſtics will be of great importance] " in order to *form a conjecture* about the two quaternions, &c." This interpretation would make the moſt connected meaning for the whole paſſage; but I do not recollect, nor can I find upon the ſtricteſt ſearch, any inſtance, wherein the verb φράζεσθαι is uſed in the ſenſe of *conjecturing*, or *forming a judgement or opinion about*.

appearance

appearance. It would be unpardonable not to mention, that ſo great an authority as that of THEOPHRASTUS is againſt the ſide of the queſtion to which I incline. The doctrine of the influence of lunar aſpect is expreſsly aſſerted in his Treatiſe on the Signs of Rain and Wind. He ſays, that the new Moon is generally a time of bad weather, becauſe the light of the Moon is wanting(l); and that the changes of weather generally fall upon the ſyzygies or quadratures. But this ſeems to have been merely an opinion founded upon an imaginary analogy between the epochs of ſyzygy and quadrature in the months, and the equinoxial and tropical epochs in the year. For the Moon, he ſays, is, as it were, the Sun of the night. THEOPHRASTUS, though a diligent obſerver of nature, was deep in the theory of that ſchool, of which he was himſelf one of the brighteſt ornaments: and his teſtimony, with reſpect to the matter of fact, hath not, like ARATUS's, a credibility founded on the mediocrity of his genius.

In the table, p. 177. the changes which fell on the ſyzygies and quadratures, or on any one of PLINY's critical days of the Moon's age (which are the 3d, 7th, 11th, 15th, 19th, 23d, 27th,), are diſtinguiſhed from the reſt by a larger character(m). And out of 69 changes regiſter-

(l) Διὸ καὶ αἱ συνόδοι τῶν μηνῶν χειμέριοί εἰσιν· ὅτι ἀπολείπει τὸ φῶς τῆς σελήνης, &c. THEOPHRAST. de ſignis Pluv. p. 417. Edit. Heinſ.

(m) Sunt et ipſius Lunæ octo articuli quoties in angulos ſolis incidit, pleriſque inter eos tantum obſervantibus præſagia ejus, hoc eſt tertia, ſeptima, undecima, decima quinta, decima nona, vigeſima tertia, vigeſima ſeptima, et interlunium. PLIN. Nat. Hiſt. lib. XVIII. c. 35.

ed

ed in this table 32 claim that diſtinction. Which is rather a larger proportion of the whole number, than is due to the time made up of all the days of ſyzygie and quadrature, in the whole year, together with PLINY's critical days, thrown into one ſum. For ſince there were 365 days in the year, and the days of ſyzygie and quadrature, with PLINY's critical days, amount to 113, out of 69 changes in the whole year 22 are as many as belong to theſe particular days, upon a proportional diſtribution. But in the preceding table, there are many alterations marked as changes, when it appears, that the weather returned to what it had been before the time of change, within the ſpace of 24 hours after it. Now if we reject all theſe on both ſides of the queſtion (which I think is the fair way of reckoning, for ſudden alterations, of ſo ſhort a duration, are rather to be called irregularities than changes of weather), we ſhall find but 46 changes in all, from one ſettled ſtate to another, of which only 20 fell on the days of ſyzygies, quadrature, or PLINY's days, which is ſtill more than the juſt proportion.

But again. PLINY's eight critical days were probably intended for the four days of ſyzygie and quadrature and the four of octagonal aſpect(n). For if the time of the conjunction be rightly aſſumed, the mean quadratures, and the mean oppoſition, and the mean octagonal aſpect, will always fall either on one of PLINY's days, or on the day next to it. The deviation, I ſuſ-

(n) The words, Quoties in angulos ſolis incidit, imply this.

pect, was intentional, and for the ſake of the odd numbers. Thus the 4th, 8th, and 12th days of the Moon ſhould have been critical, inſtead of the 3d, 7th, and 11th, if the mean motions of the Moon had been the ſingle thing attended to. But PLINY, or whoever was the firſt author of the rule he gives us, choſe the latter as containing, beſides much of the lunar influence, all the magic virtue of imparity, of which the others, taking their numerical denomination from even numbers, are totally deſtitute. Among the numerous believers in the Moon of our days, few, I ſuppoſe, retain any confidence in the phyſical powers of the odd numbers. They may imagine therefore, that the apparent inconſiſtence of PLINY's rule with the truth of things, may be owing to his ſuperſtition about the odd numbers, which led him wilfully to deviate from the mean epochs, little apprized (for the Romans never were aſtronomers) how much they ſometimes differ from the true ones, on account of the great and various inequalities of the Moon's motions, and how very widely his arbitrary arrangement would in conſequence often differ from the times it was intended nearly to repreſent. Inſtead of PLINY's critical days, I ſhall now, therefore, examine the days for which, I imagine, they were ſubſtituted; thoſe I mean of true ſyzygie, true quadrature, and true octagonal aſpect. The following table diſtinguiſhes the changes of weather which fell on theſe days. There were only 22 ſuch out of all the 69; which is ſcarce four more than their even proportion. And rejecting, as before, on both ſides,

the alterations of weather which were reverſed within the ſpace of 24 hours, there remain out of 46 changes in all only 10 upon the days of lunar influence, which are two leſs than belong to them upon the even chance; for the days of ſyzygie, quadrature, and octagonal aſpect, in the whole year are 98; and $365 : 98 = 46 : 12\frac{1}{2}$ very nearly. It is remarkable, that of theſe ten changes two only coincide with a new Moon; namely, thoſe of the 10th of February and 5th of September, and none at all with a full Moon. There were indeed two changes in the year upon the day of the full Moon; *videlicet*, thoſe of the 20th of September and 18th of November; but both were reverſed within the ſpace of 24 hours.

TABLE IX.

| | | | |
|---|---|---|---|
| January | 6 7 9 10 14 18 23 25 26 30 | 10 | 3 |
| February | 4 7 8 10 13 15 17 20 | 8 | 3 |
| March | 10 | 1 | 0 |
| April | 4 8 28 29 | 4 | 1 |
| May. | 5 7 23 | 3 | 0 |
| June | 6 17 18 20 22 28 30 | 7 | 3 |
| July | 5 15 20 22 27 31 | 6 | 1 |
| Auguſt | 4 6 11 15 17 26 | 6 | 2 |
| September | 1 5 7 11 13 14 17 20 22 | 9 | 4 |
| October | 3 23 24 29 | 4 | 1 |
| November | 2 6 7 18 21 26 | 6 | 3 |
| December | 2 5 11 14 15 | 5 | 1 |
| | | 69 | 22 |

I have added in this table two columns, ſhewing the number of changes in each month, and the number out of each agreeing with the Moon.

I ſhall only add, that no concluſion muſt be drawn from the obſervations of a ſingle year.