Observations on the climate of Penzance and the district of the Land's End in Cornwall : with an appendix containing meteorological tables, and a catalogue of the rarer indigenous plants. Read before the Penwith Agricultural Society, and published by request of the members / By John Forbes.

OBSERVATIONS

ON THE

CLIMATE OF PENZANCE

AND THE

DISTRICT OF THE LAND'S END

In Cornwall;

WITH AN APPENDIX

CONTAINING METEOROLOGICAL TABLES, AND A CATALOGUE OF THE RARER INDIGENOUS PLANTS.

Read before the Penwith Agricultural Society, and published by request of the Members.

BY JOHN FORBES, M. D.

Secretary of the Royal Geological Society of Cornwall, and Physician to the Penzance Dispensary.

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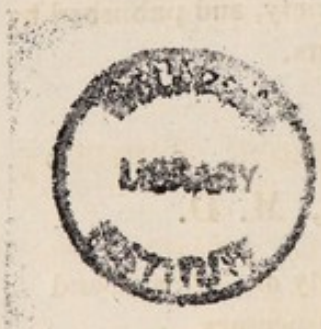

TO

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Secretary,

AND

HENRY BOASE, Esq. of Penzance,

Treasurer

Of the Penwith Agricultural Society;

THE FOLLOWING LITTLE TRACT
IS RESPECTFULLY
DEDICATED,
BY
THEIR OBLIGED AND FAITHFUL FRIEND

JOHN FORBES.

ADVERTISEMENT.

IN complying with the request of the members of the Society, to whom the following observations were originally addressed, to give them greater publicity through the medium of the press, I am willing to believe that I am, at the same time, contributing something to the existing stock of meteorological knowledge. Inconsiderable as may seem the extent of this little work, I hope it will be found to contain a fuller account of the climate of this part of the island than has yet been published; and from the rigidly inductive mode followed in its composition, I trust I cannot be mistaken in considering the results stated in it, as perfectly authentic, and therefore to be depended on. These are, in fact, simply the average results of the last fourteen years;—and must, therefore, be correct for that period at least.

In drawing up my Paper, although I have been especially careful to give a fair and impartial view of the subject treated of, without bias towards any particular object, still the medical reader, I doubt not, will perceive, in some of the minuter details, a tacit reference to the influence of climate on the living body. This might naturally be expected from the character of the writer's general studies, and is, I hope, more than justified by the surpassing importance of that particular application of our meteorological knowledge.

My medical friends at a distance, who have frequently requested information from me respecting the very peculiar climate of this place, will receive this little publication as a fuller and more authentic account than I could otherwise communicate; and I trust they will find in it every particular necessary to enable them to form a correct opinion of the merits of Penzance, as a residence for that class of invalids usually recommended to places enjoying mild seasons.

It did not enter into the plan of the present undertaking, to discuss the subject of the influence of this or any other climate in certain diseases; nor, indeed, has my residence in this place been sufficiently long to justify me in entering on such an enquiry. In prosecuting, however, the extensive subject of the medical Topography of this district, (a subject to which a physician practising in the country is naturally led,) I shall eventually, I trust, come to the consideration of this important topic; in the meanwhile I shall be much gratified and flattered, should the publication of my little work have the effect of facilitating my future inquiries, by inducing some of my medical brethren resident in different parts of the kingdom, to lay before the public accounts of the climate of their respective neighbourhoods, in the same plain and deductive method which has been adopted in the following pages.

Penzance 18*th Dec.* 1820.

OBSERVATIONS

ON THE

CLIMATE OF PENZANCE.

Read before the Penwith Agricultural Society, October 12th, 1820.

IN drawing up the observations on the climate of this district, which I have the honor of presenting to the Society, I have been principally indebted to the materials kindly afforded me by my friends Mr. Giddy and Mr. E. Giddy, Surgeons of Penzance, and to their relative Mr. John Giddy, of Calenick, near Truro:—my own personal observations extending only to the last three years. Mr. Giddy's observations extend from 1807 to the present time; Mr. E. Giddy's, which are on a more enlarged scale, and are recorded in the Journals of the Cornwall Geological Society, comprehend only the last three years. From these Journals I have constructed the general Tabular views of temperature, atmospheric pressure, rain, wind, &c. which I have the honor to present to the Society;* and as these exhibit the average of so many years, I am disposed to consider them as offering a fair view of the general state of the weather in this extremity of the island.

The general character and peculiarities of the

* See Tables in the Appendix.

climate of this district depend, as in other cases, on its geographical position and physical configuration. Placed in the lowest latitude of the island, its seasons ought, on this account, to possess a more genial character, than those of the more northern parts. And this effect of geographical position is greatly increased by other circumstances. The whole of Cornwall, indeed, but more especially the district of the Land's-end, possesses, as far as regards climate, all the advantages and disadvantages of a small island. And, accordingly, any one acquainted with the general principles that regulate climate, will have no difficulty in estimating, beforehand, the nature of that possessed by this district, if he only considers it as a small island, moderately elevated above the level of the sea, and placed at a considerable distance (say 30 or 40 miles, that is, half the length of the county) to the westward of the most southerly point of the main land.

OF TEMPERATURE.

Mean Temperature. The documents in my possession, although very accurate and valuable as far as they go, are not sufficient to enable me to deduce, quite satisfactorily, the mean temperature of Penzance. This can only be done, with any degree of certainty, from registers which give the temperature of the night as well as the day; and the journals above mentioned record only the temperature of that portion of the day included between the hours of seven in the morning and three in the afternoon. The

morning observations recorded in these were made at 7. a. m., with the exception of the months of December and January, in which the temperature was noted an hour later, viz. at 8. The mean of these observations, which are given in the first column of Table I., is 50.05° :* and, I think it will only be making due allowance for the daily increase of temperature from seven to eight, during the ten months in which the observation was taken at the former hour, to assume 51° as the mean temperature of Penzance (during the period included in Mr. Giddy's journals) at eight o'clock in the morning. I am induced to make this remark, because it has been stated by some eminent meteorologists, that the mean of the morning observations at 8 is equivalent to the mean temperature of the place. If this principle were correct, then, by the foregoing calculations, the mean temperature of Penzance would be 51° : But this, in the present case at least, certainly gives the temperature too low; although probably less so than may at first sight be imagined, from considering the latitude of the place only. By a reference to the Tables it will be seen, that although our winter temperature is very high, our summer temperature is proportionably low; and this circumstance will approximate our mean temperature to that of places of much more inclement seasons. Still, however, the mean temperature just stated, is, in all probability, somewhat under the truth.

* In all the Tables I have omitted, for the sake of perspicuity, the fractional parts of degrees of temperature.

I find on comparing the mean annual temperature of some other places, as deduced from the daily maxima and minima of a register-thermometer, with the morning observation at eight, at the same place, that the former is about one degree and half greater than the latter. Now if we believe that the results of the register-thermometer are most correct, and that these give, generally, a superiority of a degree and half over the 8 o'clock observation,—the adoption of this principle in the present case will give 52.5° as the mean temperature of Penzance.

It has been further ascertained that the mean of three observations, namely, in the morning, afternoon and evening,—comes very near the mean temperature of the place. On this principle, and assuming the evening temperature to be the same as the morning,(and I know from experience that this is very generally the case), we have 51.5° or 52° as the degree of our mean temperature. And I am disposed to fix on this as the truth; more especially as it accords with the result of my observations on the temperature of the springs and draw-wells in this neighbourhood. This is somewhat below the mean temperature usually assigned to this latitude; which, according to the philosophical principles of Mayer and Professor Leslie, ought to be about 53°, and, according to the calculations of Kirwan, 52.9.°

It is well known that the mean temperature of two places may be the same, although that of their different seasons may vary exceedingly. This is stri-

kingly exemplified in the case of Penzance. We have already mentioned how exactly this place assimilates in its meteorological habitudes with a small island; and the truth of this statement appears from an examination of the mean temperatures of the different seasons.

Like all small islands, in other words, like the surrounding sea, Penzance has a mean summer temperature considerably under, and a mean winter temperature considerably above, the mean of places similarly situate as to latitude, but differing in the latter being placed at a distance from the sea, whether on a continent or large island. This appears very evident from the Tables, which, reckoning on the same principles as in fixing the mean annual temperature, give the following, in round numbers, as the mean temperature of the different months and seasons :—

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
41°	44°	44°	49°	56°	60°	62°	61°	58°	53°	46°	43°

Spring.	Summer.	Autumn.	Winter.
45°	59°	57°	43°

From various considerations I am led to conclude that the mean height of the thermometer at 8 a. m., although not precisely equal to the mean temperature of the place, yet affords a sufficiently correct criterion of the mean temperature of the day, season, or year, at the place of observation. I am more particularly led to make this remark, because, in the observations I have had occasion to make respecting the comparative temperature of Penzance and other places, I have

for the most part confined myself to the results of the morning observations only.* I adopted this plan, partly because the morning observation was the only one, in many cases, to be procured, but, principally, because by means of it I was enabled to compare the temperature of the different places, for the most part, at the same hour, and, as far as practicable, during the same years. This circumstance I conceive to be of great importance, as it is well known how very variable the temperature of different years is at the same places.

Variation of Temperature. The truly peninsular situation of Penzance, as has been already remarked, accounts for the remarkable equability of its temperature. In this respect it certainly exceeds any other place in the island of which meteorological accounts have been published: and this singular equability is conspicuous no less in the variations of temperature of successive days, or hours, than in the extreme range of the day, month, or year. In proof of this I need only refer to the four last columns of Table I., and to the comparison hereafter to be instituted between the temperature of Penzance and some other places.

The utmost range in the thermometer at Penzance in any one year has been 55°; and the mean annual range has been only 49°: the extreme range in the whole series of years (viz. from 19° to 78°) has been only 59°, which is certainly less than any recorded in this country. The mean monthly range of

* See Table V.

the thermometer, that is, the mean of the greatest variations of each month for the 14 years, has been 21°. The following is the monthly and daily range for the different seasons; and also the mean variation of successive days at the same hour:—

	Winter.	Spring.	Summer.	Autumn.
Monthly range - - - - - -	22°	24°	20°	19°
Daily range - - - - - - -	8°	15°	16°	14°
Mean of the greatest variations of successive days	11.41°	9.5°	5.4°	7.6°
Mean variation of successive days - - - -	3.77°	2.97°	1.72°	2.28°

The annual mean of the greatest variations of successive days for each month, at the same hour, viz. 7 and 8 a. m., is 8.64°; and the mean variation of successive days is 2.68°.

In regard to the comparative temperature of the different seasons and months, it appears that this is equally indicative of the uncommon equability of the climate of this place.

The greatest variation between the mean temperature of any two successive months is 7°; while the mean variation of successive months is only 3.5°, or, calculating from the morning observation, 3.33°. The following is the statement of this mean monthly variation for the different seasons:—

	Winter.	Spring.	Summer.	Autumn.
By the morning observation -	3.66°	2°	4.66°	3°
—— mean of morn. & aftern.	4°	2.66°	4.66°	3.33°
—— —— morn. aftern. & even.	4°	2.66°	4.33°	3°

The variation of temperature between the different *seasons* is also very small; in other words, their mean temperature is remarkably equal. The following is the difference:—

Between Winter and Spring - - -	2°
—— Spring and Summer - -	14°
—— Summer and Autumn - -	2°
—— Autumn and Winter - -	14°

The coldest month is January;—the warmest month is July:—April and October approach nearest to the mean temperature of the year.

From the foregoing statements it will appear evident to those acquainted with meteorological details, that the temperature of Penzance is remarkable for its small annual, monthly, and daily range, and for its equability from day to day; and, also, that the mean temperature of our winters is uncommonly high for a British locality, and our summer temperature uncommonly low for our southerly latitude. It is, also, apparent that the difference of temperature between the different seasons is remarkably small, and especially between autumn and winter, and between winter and spring. But these circumstances will appear more evident by briefly mentioning a few of the very numerous and striking results, which I have deduced from a minute comparison of registers of the weather, kept at different places in the island.*

Taking the three months November, December, and January, together, I find that the temperature

* See Table V.

of the south coast of Devonshire, as, for example, Sidmouth, Dawlish, Torquay, and Plymouth, (all which places have very nearly the same temperature,) is 3° less than Penzance;—that Gosport, and the Isle of Wight, are also 3° colder;—that Exeter and Clifton are 4° colder;—that London is 5°, and the centrical parts of the low-lands of Scotland 7° colder.

To instance some of these somewhat more particularly:—1. Mean of the winter months at Sidmouth and Penzance at 8 a. m., for the same two years (1813, 1814):—

	Nov.	Dec.	Jan.	Mean.
*Sidmouth - -	44°	41°	34°	39°
Penzance - -	45°	49°	37°	43°

Superiority of Penzance in December 8°, in the whole period 4°.

2. Mean of the winter months at Exeter and Penzance, at 8 a. m., for the same five years (1814—1818):—

	Nov.	Dec.	Jan.	Mean,
†Exeter - -	43°	37°	34°	38°
Penzance -	47°	43°	41°	43°

Superiority of Penzance in January 7°, in the whole period 5°.

3. Mean of the winter months at Plymouth and Penzance, for the same two years (1814, 1815):—Plymouth, mean of the maxima by register-thermometer; Penzance, mean at 2 p. m. by the common thermometer:—

* Dr. Clarke in Thomson's Annals.

† Original Journal of E. P. Pilcher, Esq.

	Nov.	Dec.	Jan.	Mean.
*Plymouth -	47°	45°	37°	43°
Penzance -	50°	47°	39°	45°

Superiority of Penzance 2°.

4. Mean of the winter months at Clifton and Penzance; the former at 1 p. m. and for a period of thirteen years (1804—1816); the latter, mean of 8 a. m. and 2 p. m. for eleven years (1807—1817):—

	Nov.	Dec.	Jan.	Mean.
†Clifton - -	46°	43°	39°	42°
Penzance -	47°	43°	42°	43°

5. Mean of the winter months at the Isle of Wight and Penzance:—Isle of Wight at 9 a. m., mean of ten years (1809—1818); Penzance at 8 a. m., mean of eleven years (1807—1817):—

	Nov.	Dec.	Jan.	Mean.
‡Isle of Wight -	44°	39°	37°	40°
Penzance - -	45°	42°	40°	42°

Superiority of Penzance 2°.

6. Mean of the winter months at Gosport and

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* Mr. Fox in Thomson's Annals. It will be observed that the register-thermometer must often give a *higher* maximum than the common thermometer at 2 p. m. and cannot give a *lower*. On this account, the superiority of two degrees in this case is certainly more remarkable than double that number would have been by the common thermometer.

† Dr. Chisholm in the Edinburgh Medical and Surgical Journal. There is no doubt that the temperature of Penzance at 1 p. m. is very considerably above the mean of 3 a. m. and 2 p. m.; the results above stated, then, show very strongly the inferior temperature of Clifton.

‡ Original Journal of G. Kirkpatrick, Esq. The same observation is applicable here as to Clifton. Of course the temperature is considerably greater at nine o'clock, than at eight.

Penzance, at 8 a. m., during the same four years (1816—1819):—

	Nov.	Dec.	Jan.	Mean.
*Gosport - -	43°	37°	39°	39°
Penzance - -	45°	40°	43°	42°

Superiority of Penzance 3°.

7. Mean of the winter months at London and Penzance, at 8 a. m., during the same three years (1817—1819):—

	Nov,	Dec.	Jan,	Mean.
†London - -	45°	36°	38°	39°
Penzance - -	48°	40°	44°	44°

Superiority of Penzance 5°.

8. Mean of the winter months at Kinfauns (Perthshire), and Penzance at 8 a. m., during the same six years (1813—1818):—

	Nov.	Dec.	Jan,	Mean.
‡Kinfauns - -	39°	34°	32°	35°
Penzance - -	47°	43°	40°	43°

Superiority of Penzance 8°.

In stating these differences between each of those places and Penzance, it must be recollected that it is the *average* of the whole season that is given. The difference between the *greatest* degrees of cold is much greater, owing to the superior equability of the Penzance climate. As a proof of this I shall merely refer to the temperature of a few places during the severe weather of last January.

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* Dr. Burney in Thomson's Annals.

† Cary in Philosophical Magazine.

‡ Kinfauns register in Thomson's Annals.

In the night, in the neighbourhood of London, and during the day in many parts of Scotland, the thermometer was several degrees below zero. At the same hour in the morning (8 o'clock), the following was its lowest degree at the places mentioned:— Penzance 22°; London 11°; Exmouth 8°; Scotland 0°. The lowest point to which it has fallen, at Penzance, at 8 o'clock in the morning, during the last 14 years (as already mentioned,) has been 19°, and this only once.

There is less difference between the temperature of the three spring months. Our springs, although warmer than the places abovementioned, (except perhaps Devonshire,) are, however, not nearly *so much* superior in this respect, as our winters are. For example, by the registers in my possession it appears that the temperature of the south coast of Devon is precisely the same during spring as that of Penzance, while Gosport, the Isle of Wight, and Clifton, are only 1° less; London is 2°, and Scotland is 5° less. From this it follows, that, taken comparatively with our own winters, our springs are *colder* than in most other parts of the island; in other words, there is less difference of temperature between our winters and springs, than between the temperature of these two seasons in the other places.

As we advance towards the warm season, the superiority of our winter temperature, which we have found declining in spring, is now totally lost. The summers of nearly all the other southern and centri-

cal counties of England, are warmer than ours. By the single observation at 8 o'clock, it is found, by my Tables, that the south coast of Devonshire, Gosport, and the Isle of Wight, and, also, London, are one degree, at least, warmer; and it is only in Scotland that the temperature is less. By the two observations taken together, the difference is still greater in favour of the temperature of these places. But it is in the *maximum* temperature of particular days that this difference is most remarkable. Without detaining you with any minute specification of this, I need only recall to the recollection of every one, the great elevation which he has either seen or heard the thermometer to reach, in the warmer months, in London, or in any place out of Cornwall. To be above 80° on many warm days in any summer, is not looked upon as at all extraordinary; to be as high as 84°, or 86°, on one or two days, (sometimes, indeed, several degrees higher,) is far from a rare occurrence. Now, it appears from Table I. that during a period of 14 years, the greatest height reached by the thermometer at Penzance was 78°.

To instance more particularly London:—It appears from the register published in the Philosophical Magazine, that the average of the *greatest heights* of the thermometer at London, for the last three years, (1817, 1818, 1819) *at noon,* has been 83° for June; 80° for July; and 79° for August; while the average at Penzance *at* 2 *p. m.* (that is, at an hour universally warmer, by several degrees, than

noon,) has been only 73° for June and July, and 72° for August. The average of the three months makes the maximum temperature of London 8° above that of Penzance. From all this it is evident, that, compared with the rest of the island, Cornwall, and more particularly the district of the Land's-end, is fully as remarkable for its cool summers, as its warm winters.

It must not, however, be supposed that the *mean temperature* of our summers is so very much below that of the places mentioned, as the last observations may seem to imply. The fact is, that the very superior temperature of the *day* in the interior and more easterly parts of the island is, in a great measure, counterbalanced by the very inferior temperature of the *night* there; so that, while the average heat of the forenoon and afternoon is six, eight, or ten degrees above ours, the average heat of the whole diurnal period (night and day), is probably only one or two. In further illustration of this, I shall here compare the temperature of the month of August in the present year (1820) as ascertained by the register-thermometer, at Penzance, and at Edmonton, in the neighbourhood of London. I choose this particular month, not because it affords conclusions peculiarly applicable to the point in question, but merely because it is the only period of which, as far as I know, any such comparative records are to be found. The results are certainly very striking, and place in a conspicuous point of view the most distinguishing feature of our climate—*its equability*. The London

(or rather Edmonton) observations are recorded by Mr. Howard, and published in Thomson's Annals; those at Penzance were recorded by myself.

		London.		Penzance.
Absolute maximum		81°	—	67°
——— minimum		38°	—	46°
Mean of the maxima		72°	—	64°
——— minima		50°	—	54°
Mean of both observations		61°	—	59°
Extreme monthly range		43°	—	21°
Diurnal range	Max.	32°	—	14°
	Min.	11°	—	5°
	Mean	21°	—	9°

To show the influence of our peculiar situation in modifying the temperature of the different months, and seasons, I shall further compare our mean temperature throughout the year, as given above, with that of London. In this instance I take the mean temperature of London such as I find it stated in the common books on meteorology, which will account for some little discrepancy between the results and some formerly given. It will be seen that the mean temperature of the *whole year* is almost precisely the same at both places; while that of *particular months*, and *seasons*, varies considerably, according to those well-known regulating principles already so often alluded to.

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
London	35°	42°	46°	49°	56°	63°	66°	65°	59°	52°	44°	41°
Penz.	41°	44°	44°	49°	56°	60°	62°	61°	58°	53°	46°	43°

	Winter.	Spring.	Summer.	Autumn.
London	40°	45°	61°	58°
Penzance	43°	45°	59°	57°

Exeter is the only place in the southern parts of England that I find to be actually *colder* than Penzance in the three summer months; yet the following statements will show that the temperature, even of Exeter, is occasionally much higher than ever it is with us, and that its variations are always much greater. The results are the mean of the same five years at both places, viz. 1814—1818:—

	Penzance.		Exeter.
Mean height of the thermometer in May, June, and July, at 2 p. m.	65°	—	63°
Mean of the greatest heights of the thermometer for the same months	71°	—	73°
Mean of the lowest - - - - - - - -	52°	—	49°
Extreme range - - - - - - - - -	36°	—	42°

The following is a comparative view of the temperature of Penzance and Gosport, at the same hour in the afternoon (2 p. m.), and during the same four years, viz. 1816—1819:—

	Penzance.		Gosport.
May - - - - - - - - -	63°	—	62°
June - - - - - - - - -	66°	—	69°
July - - - - - - - - -	68°	—	70°
Mean of the three months	65.6°	—	67°

Nor is this great superiority of the range of temperature confined to the places mentioned, or peculiar to any one month or season. I find, from a careful examination of the registers kept at the following places, among others, viz. Sidmouth, Plymouth, Exeter, Isle of Wight, Gosport, London, and Kinfauns, that the mean of the monthly range, throughout the year, at all these places, exceeds that of Penzance by no less a proportion than *one fourth*.

This remarkable equability of the climate of this district is easily accounted for by its nearly insular form and low latitude; although, I confess, I was not at all aware of its extent before I set about this enquiry. In this respect, there is certainly no place in the British islands that can equal it, unless it be in the neighbouring islands of Scilly. Of the temperature of these islands no record, as far as I know, has yet been published, and I regret that it is not in my power, as yet, to supply the deficiency. The only document relative to this subject which I possess, is a register of the temperature, winds, and weather, for 46 days in the months of September, October, and November, in last year (1819), kindly kept for me by my friend Mr. Thrackston, at the island of Tresco.* This document shows very satisfactorily, as far as it goes, what might have been expected, the very superior equability of the Scilly islands. The following are the results:—

	Tresco.		Penzance.
Mean of September at 8 a. m.	58°	—	57°
—— October & November	52°	—	50°
—— both - - - - -	55°	—	53.5°

Inferiority of Penzance - 1.5°

	Tresco.		Penzance,
Mean of September at 2 p. m.	61°	—	63°
—— October & November	55°	—	56°
—— both - - - - -	58°	—	59.5°

Superiority of Penzance - 1.5°

* Tresco is about two miles long, and a mile and half broad.

The following is the mean of the morning and afternoon observations taken together at both places:

	Tresco.		Penzance.
Mean of September - - -	59.5°	—	60°
—— October & November	53.5°	—	53°
—— both - - - - - -	56.5°	—	56.5°

This proves the mean temperature of both places to be precisely the same. The superior equability of the island is further shown by the following results:—

	Tresco.		Penzance.
Mean diurnal range for the 46 days - -	3.23°	—	6.23°
Mean variation of successive days at the same hour in the morning - -	2.20°	—	2.82°
Extreme range during the 46 days - -	24°	—	32°
Greatest diurnal range - - - - - - -	6°	—	13°
Maximum temperature during the 46 days	67°	—	70°
Minimum temperature during ditto - -	43°	—	38°

With the view of still further illustrating the effects of a very small difference of situation on the temperature, I have given in Table VI. the results observed by Mr. John Giddy, at Calenick, near Truro. This place is on the same level as Penzance, and differs from it chiefly in being removed several miles from the sea, and in being about 20 miles to the N. & E. of it. These two circumstances, it appears, operate in the same manner as in the case of the situations just mentioned, but in a degree, of course, proportioned to their extent. Thus, it appears that the mean annual temperature of Penzance is a fractional part of a degree above Calenick; while winter and autumn are a full degree warmer. The

temperature of the spring is less at Penzance by 1°,—while the temperature of the three summer months is the same at both places. The effect of position is, however, more visible in single months than in the seasons. Thus January, at Penzance, is 2° warmer than at Calenick, while July, at Calenick, is 2° warmer than at Penzance.

Before concluding this part of the subject, it may be interesting to notice, in a few words, the relative temperature of different years, and of the same seasons in different years, at Penzance. With a view to this subject I have given in Table VII. the mean morning temperature of the four seasons, and also of the whole year, for every individual year since 1807. From this it results that the three last years have been warmer than any three successive years during the whole period, and that there is very little difference of temperature between the other years. The coldest year of the series is 1808, next to this, and nearly equally so, is 1816; the warmest year is 1818, and next to this is 1815. The greatest difference between the temperatnre of any two years in the period is 4.37°; the greatest between any two successive years is 2.82°; and the mean difference of successive years is 1.13°. The following are the warmest and coldest seasons throughout the period:

	Warmest.		Coldest.
Spring - - -	1815	—	1808
Summer - - -	1818	—	1811
Autumn - - -	1818	—	1817
Winter - - -	1818	—	1815

In reviewing the account just given of the temperature of the west of Cornwall, I think I cannot more correctly sum up the whole, than in the words of old Carew, whose early work on this county is certainly the only one among the many which have appeared, that possesses the raciness of originality. "The *Spring* visiteth not these quarters so timely as the eastern parts. *Summer* imparteth a very temperate heat, recompensing his slow fostering of the fruits with their kindly ripening. *Autumn* bringeth a somewhat late harvest, especially to the middle of the shire, where they seldom inn their corn before michaelmas. *Winter*, by reason of the south's near neighbourhood, and sea's warm breath, favoureth it with a milder cold than elsewhere, so, as upon both coasts, the frost and snow come very seldom, and make a speedy departure."*

Atmospheric Pressure. From considering the locality of Penzance, the great humidity of its climate, and the great variability in the force of its winds, some peculiarity might be expected in the phenomena of the barometer. Upon comparing, however, the various results obtained, as shewn in Table II., with those obtained in other parts of the island, the only peculiarities observable are the inferior altitude and smaller range of the mercurial column, at Penzance. Before taking any particular notice of this circumstance, I shall briefly notice some of the principal results deducible from the Table. The mean

* Carew's Survey p. 15, Lord de Dunstanville's edition.

height of the barometer is 29.61. The mean height during the different seasons is as follows :—Winter 29.60; Spring 29.57; Summer 29.65; Autumn 29.63. The greatest altitude is in June; the greatest in any two consecutive months is in June and July; and in any three consecutive months, in June, July, and August. The mercury is lowest in November, of any single month; in October and November, of any two successive months; and in September, October and November, of any three consecutive months. The mean annual range is 1.95; the mean monthly range is 1.07; the extreme range during the whole period is 2.40. The following is the mean range of the different seasons:—Winter 1.16; Spring 1.17; Summer 0.77; Autumn 0.91. The greatest range is in March of any single month; in March and April, of any two consecutive months; and in January, February and March, of any three consecutive months. The least range is in June, July and August. The mean daily range is 0.6; and this varies in the different seasons as follows :—Winter 0.8; Spring 0.8; Summer 0.4; Autumn 0.6. The greatest daily range in any one month is (0.76) in March; in any two consecutive months, March and April; in any three, February, March and April.

The following is the proportion of easterly and westerly winds during the times when the barometer stood at its highest and lowest points, in the three years :—

	Wind Easterly.	Westerly.
Barometer at its highest - -	21 —	12
——————— lowest - -	10 —	22

This shows very strongly the effect of the easterly winds in raising the mercury, and of the westerly winds in depressing it. The following is the proportional prevalence of easterly and westerly winds during the highest and lowest degrees of the barometer in the different seasons:—

	Winter.		Spring.		Summer.		Autumn.	
	E.	W.	E.	W.	E.	W.	E.	W.
Barometer high -	4	2 —	4	1 —	7	2 —	3	4
——————— low -	3	2 —	3	6 —	1	5 —	1	7

As the phenomena of the barometer are (if we except the indications of the weather, on which subject I am not prepared to enter) little connected with agriculture or horticulture, I shall conclude this part of my paper by giving a comparative view of the mean results of three years in Penzance and London:—

	London.	Penzance.
Mean height - - - - - - - - - - -	29.82 —	29.61
Mean of the greatest heights of each month	30.26 —	30.09
——————— least ———————	29.17 —	29.08
Absolute maximum in three years - -	30.62 —	30.42
——————— minimum ——————— - -	28.22 —	28.28
Extreme range in the period - - -	2.40 —	2.14
Mean annual range - - - - - - -	1.95 —	1.68
Mean monthly range - - - - - - -	1.07 —	1.00
Meanof the greatest range for each month	1.24 —	1.22

Is this comparatively low standard of the barometer indicative of the great humidity of the atmosphere in this district?

OF HUMIDITY.

Cornwall has been ever obnoxious to the charge of great humidity. In as far as the charge rests on hygrometrical humidity, and, also on the *number* of days on which rain falls, perhaps it is well founded; in as much as regards the actual *quantity* of rain, the imputation is certainly beyond the truth. I am unacquainted with any hygrometrical observations that have been made in this part of the country; I cannot, therefore, give any precise statement either of the comparative or actual humidity of its atmosphere. There can be no doubt, however, that this is much greater than in the interior counties. Its situation alone may be deemed sufficient to prove this; but the fact is further demonstrated by many well known peculiarities. There is much greater difficulty, for instance, of guarding against the oxydation of iron at Penzance than at London;—a fact well known and admitted by every one here resident. The great prevalence of westerly winds in this district will be more particularly noticed hereafter; now this wind, if it does not *always* bring rain, certainly has always qualities of great humidity, sufficiently cognizable by our senses. Besides, the very great number of days on which *some rain* falls, must give rise to a moist state of the air, even if it were not naturally charged with hygrometrical vapour. Fogs, however, are not by any means common; yet our warm west winds often bring with them a sort of drizzly rain, sufficient to wet thoroughly grass and

other vegetables, or the clothes of a person exposed to it; while neither the rain-guage nor the roads or streets show any indication of its presence, unless long continued. The mean annual number of days marked *misty* in Mr. Giddy's journal is 10.

Rain. By referring to Table IV. it will be seen that the number of days on which rain falls in the year, is 157. It must not from this, however, be supposed that we have this number of what may be properly called *rainy days:*—the truth is that we have heavy showers on many of our finest days; and this is so well known and expected, that the circumstance is hardly looked upon as an inconvenience by the inhabitants. The following remark of Dr. Borlase I have found to be peculiarly applicable to the climate of Mount's Bay:—"Our rains in Cornwall are rather frequent than heavy or excessive; and we have very seldom a day so thoroughly wet but that there is some intermission, nor so cloudy but the sun will find a time to shine."

The following statements extracted from some of the recent scientific journals will give us the relative wetness of Penzance in a more determinate manner. Number of rainy days in the year at the places undermentioned:—

Penzance (14 years 1807—1820) - -	157
Sidmouth (3 years) - - - - - - -	137
Gosport (4 years 1816—1819) - - -	115
Clifton (13 years 1804—1816) - - -	147
Manchester (1 year 1819) - - - -	215

Lancaster (7 years 1809—1815) - - -	151
New Malton, Yorkshire (1817—1819) -	137
Kinfauns (Perthshire) 7 years 1813—1219)	147
Cork, Ireland (2 years 1818—1819) - -	157

After all, I fear that by this statement, I am hardly doing justice to our climate, since it results from Mr. Giddy's Journals that the number of days properly called *rainy*, is really not great. The following are the mean results of eleven years, given more in detail than in the Table:—

Number of *clear* days, or dry days with sunshine	119.63
——— *fair* days, or dry days without sunshine	81.18
——— rainy days - - - - - - - - - -	49.36
——— days with occasional showers - -	96.90
——— misty days - - - - - - - - -	9.63
——— days on which snow fell - - - -	2.18
——— days on which hail fell - - - -	4.54

With regard to the actual quantity of rain that falls, as measured by the pluviameter, it appears that this is rather under the mean of the whole of England. The only record of the fall of rain in this neighbourhood that I have met with, previously to the two given in Table II., is that kept at Ludgvan and published by Dr. Borlase in the Philosophical Transactions:—This gives the mean of five years at 41 inches, which is far above the mean of England. Not having access at present to the original account of Dr. Borlase, I am unable to form any opinion whether there was any circumstance, either in the

manner of observing, or in the period, that could account for a proportion so much exceeding that recorded in my Table. But in order that a more accurate judgment may be formed of the comparative fall of rain in this part of the island, I have collected, from various sources, recent accounts of the fall of rain in numerous places in this country, as near as possible to the period included in the Penzance and Calenick Tables.* From this it appears that the fall of rain in the west of Cornwall as stated in Table II., viz. 25 inches, is in fact considerably below the standard of the island. In the Table, I have given the mean monthly fall of rain at Calenick for six years, and at Penzance for two; and I shall consider the mean of both these as the nearest approximation to the truth yet attainable:—it is this I use in the following observations.

With regard to the relative dryness of the different parts of the year,† it appears that the five months from October to February inclusive are the wettest, as well in the number of rainy days as in the actual fall of rain. Considered in respect of the number of rainy days only, it appears that the above-mentioned five months differ very little; that November is the wettest month; November and December the two wettest consecutive months; June is the driest; March and April the two driest consecutive months, and next to these and nearly equally dry, are June and July.

* See Table VI. † See Table III.

The fall of rain, and the proportion of wet days in different months and seasons very nearly accord; for instance, the greatest number of wet days in any one month is in November, and the greatest fall of rain is in the same month at Penzance, and in October at Calenick; the greatest number of rainy days in any two consecutive months, is in November and December; while the greatest fall of rain is in the same two months at Penzance, and in October and November at Calenick. The converse does not hold equally good; for instance, there are most dry days in June, but there is least rain in March; the two driest consecutive months are June and July; while the fall of rain is the smallest in March and April.

Of the quantity of rain received by the rain-gauge at Penzance I find that *one third* more fell during the night than during the day. There is however, nothing peculiar in this; as I find from Mr. Howard's meteorological Tables for London, that the very same proportion was observed by him in the years 1807, 1808, and 1809. It may be, also, proper to observe that the rain-guage at Penzance is placed on the top of a house (between 30 and 40 feet from the ground) in a situation not at all influenced by the adjacent buildings. As the water is conducted from the funnel to the guage by a pretty long tube of nearly an inch in diameter, some little allowance ought probably to be made for evaporation during the conveyance.

Snow. It appears from Tables III. and IV. that

the average number of days on which snow has fallen in any one year is very little more than two and half; and, including the days on which hail showers are noted, it scarcely amounts to nine. It appears, also, that of the fourteen years included in the Tables, there have been four on which no snow fell. Of course, the existence of causes to prevent the fall of snow will prevent its continuance on the ground; and the fact is that snow never remains on the soil in the vicinity of Penzance more than a day or two, seldom, indeed, more than a few hours; and even on the highest grounds, in the centre of our narrow peninsula, it seldom has been known to continue, more than a week or ten days.*

Frost. The first column of Table I. which gives the mean temperature of the different months at 7 and eight in the morning, will at once show that our frosts in this district must be slight and transient. And this is so remarkably the case, that it is a rare occurrence for the ponds in this district to be frozen sufficiently to bear the weight of a man, or even a

* In transcribing this paper for the press, I have, especially in the latter part of it, introduced several circumstances which seem necessary illustrations of the subject of this essay, but which are too well known to the members of the society to have been stated to them formally in the original reading of the paper. I make no apology for this inconsistency, as it is surely of less consequence that the paper should repeat what is already well-known to my friends here, than that, for the sake of mere punctilio, it should fail to convey a correct view of the subject to many others who might be interested in it, but who are unacquainted with the circumstances alluded to. I make this remark, once for all, and shall occasionally, in the sequel, rather consider myself as addressing my friends at a distance, who are ignorant of our genial seasons here, than my respected fellow-members of the Penwith Agricultural Society.

boy. The consequence is that *skating* as an amusement is entirely unknown among the young men of Penzance; and is considered as rather a singular phenomenon when exhibited by strangers, or by those among the natives who have learnt the art in other parts of the country. The marsh between this place and Marazion, which is generally overflowed in the winter season, and which offers, when frozen, a very fair field for the skater, I find upon referring to my note book, has been only four times distinguished by this exercise during the last thirty years, viz. in 1788, 1794, 1814, and 1819. There probably have been some other years in which this piece of water has been sufficiently frozen for the purpose, yet these are the only years wherein skating is recollected by several of my friends in Penzance, to have been practised during that period. And, indeed, when we attend to the degree of the winter temperature during the last fourteen years, as given in the Tables, we perceive that the solidification of water to suit the purpose of the skater, must, of necessity, be a very rare occurrence in this neighbourhood. During the thirteen years from 1807 to 1820, the thermometer at 7 and 8 in the morning has only been 37 *times* below the freezing point, which gives an average of less than *three* days for each winter during that period, in which the formation of ice was possible. The following Table exhibits the mean of the minimum temperature of each of the six winter months for the thirteen years; and also the

number of times the thermometer fell below the freezing point:—

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Mean of the minimum temp. in each month, for 13 years	36°	29°	29°	33°	33°	36°
Number of times below 32° during 13 years - - -	4	10	9	4	8	2

THUNDER.

Thunder appears to be of rarer occurrence in this district than in most others in the kingdom.* The historians of Cornwall, it is true, like all topographical writers, have occasion to record some severe thunder-storms which committed considerable damage; but these seem recorded rather from their calamitous events, memorable in a confined neighbourhood, than from any thing uncommon in their severity. From our Tables it appears that the mean number of days on which thunder has been heard, annually, is only *two and half*, and the greatest number of days in any one year is only *seven*. It also appears that the three winter months, January, February and March, are those in which thunder is most frequent; a circumstance, I apprehend, which is contrary to the state of the fact in most temperate countries, summer being the season in which this meteor most frequently occurs.

With the view of rendering this peculiarity more obvious, I shall here contrast the average number of thunder-storms in each month, for a period of

* See Tables III. and IV.

five years, at Kendal and Kewick, as given by Mr. Dalton, with those recorded in our Tables:—

1. For the whole year:—

	Jan.	Feb	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Kendal	.20	00	00	.60	1.40	1.00	2.40	1.40	.80	.40	00	.20
Penz.	.21	.44	.35	.07	.21	.28	.21	.28	.14	.21	.07	.07

2. For the different seasons:—

	Kendal.		Penzance.
Winter - - -	.40	—	.35
Spring - - -	.60	—	.86
Summer - - -	4.80	—	.70
Autumn - - -	2.60	—	.63
Total - - - -	8.40	—	2.54

These statements sufficiently prove the infrequency of thunder-storms in this neighbourhood, and show that the Land's-end district, at least, is by no means entitled to the character given to Cornwall by Dr. Young, viz. of being "more exposed to thunder than any county in Britain."*

WINDS.

"Touching the temperature of Cornwall," says Carew, "the air thereof is cleansed as with bellows, by the billows, and flowing and ebbing of the sea, and therethrough becometh pure and subtle, and by consequence healthful." "This notwithstanding" (he says in another place) "the country is much subject to storms, which fetching a large course in the open sea, do from thence violently assault the dwellers at land, and leave them uncovered houses, pared hedges

* Lectures on Natural Philosophy, vol. II.

and dwarf trees as witnesses of their force and fury." Dr. Borlase gives the same account of the frequency and violence of the storms and squalls in Cornwall, and my own experience leads me to the same conclusion. Indeed, I think the climate of the west of Cornwall is fully as remarkable for its great variability in respect of wind and rain, as it is for the singular unchangeableness of its temperature. The following statements will show the relative frequency of winds from different quarters; they are the mean results of the first eleven years of our period of observation :—

	No. of days.
North winds - - - - - - - - - - - -	36
South winds - - - - - - - - - - - -	45
East winds - - - - - - - - - - - -	37
West winds - - - - - - - - - - - -	39
Winds from the intermediate points of N. & E.	38
——————————— S. & E.	36
——————————— N. & W.	76
——————————— S. & W.	58

It appears from this that the south wind is much more prevalent than the north; but that there is very little difference between the direct east and west wind. It shows, also, that there is little difference in degree of prevalence between the N. E. and S. E.; while the N. W. exceeds very considerably the S. W. Dividing the direct north and south winds equally between the eastern and western points, and the direct east and west winds between the northern and southern points, the following is the

elative proportion of easterly and westerly, and northerly and southerly winds:—

Easterly winds -	151.5	Northerly winds -	188
Westerly winds -	213:5	Southerly winds -	177

This shows very satisfactorily how much more prevalent westerly winds are in this district than any others; it also shows that, although the direct south winds are much more prevalent than the direct north winds, yet that winds from all the northerly points taken together, are considerably more prevalent than from all the southerly points:—this is principally owing to the greater prevalence of the north-west winds. Taking the south winds and westerly winds together, and the north and easterly, the former are about one third more than the latter; viz.

South and westerly winds - -	218
North and easterly winds - -	147

In regard of the relative prevalence of the different winds in the different seasons, it will be seen from Table III. that easterly winds prevail nearly in an equal degree in summer and autumn; somewhat more in winter, and most of all in spring. Of course the westerly winds are precisely the reverse. Easterly winds prevail most in April, and least in August, reckoning the months singly; of any two consecutive months they prevail most in March and April, and least in July and August; of any three consecutive months they prevail most in March, April and May,

and least in the three following months, June, July and August. If we reckon our winter to commence with December, our spring with March, our summer with June, and our autumn with September, (which probably would be a correct natural division), the statement of the case would be—that easterly winds prevail by far most in spring, least in summer, and more in autumn than winter, as in the following Table:—

Easterly winds in winter (Dec. Jan. Feb.) -	34
——————— spring (Mar. Apr. May) -	44
——————— summer (June, July, Aug.)	32
——————— autumn (Sept. Oct. Nov.)	38

The relation of different winds to the temperature and humidity of a climate is an important matter of consideration; I shall therefore, in this place, make a few remarks on the subject. Generally speaking, it is true, that in the seasons in which westerly winds prevail most, there are most wet days;—thus, in the months of March, April and May, there are only 2 days more of westerly than easterly winds, while in December, January and February, there are 21; accordingly we find the number of wet days in the former months is only 34, while in the latter it is 46. It is true, that in the three following summer months the proportion of westerly winds is still greater than in the winter months, while the number of wet days is considerably less; but it must be remembered, that there is in the latter case the counteracting influence of the fine season.

The effect of the two different winds is so well known, that it is common to believe, when the wind is easterly, that there will be no rain; while, when it is in the opposite direction, however promising in other respects the sky may be, precautions against the probable irruption of western showers are seldom forgotten.

The influence of particular winds in altering the temperature is still more important and remarkable: and were it not that the same effects are found in other parts of the country, and that the statements made in the beginning of this paper prove the contrary, one might be induced to believe that the assertion of the superior equability of our temperature, so much insisted on in the preceding pages, has been hazarded without sufficient authority. It is, indeed, true, that owing to the nature of our situation precluding, in a great measure, the disturbing influence of local causes, we receive the impressions brought by the different winds purer, and less modified, than in most other parts of the country; still, it will be found, that, in other parts, the variations of the actual temperature are very much greater than ever they are observed in this district.

It may be stated as a general fact, that the south and west winds are uniformly warm and soft, and the north and east winds uniformly cold and sharp. These unvarying effects on sensation are, as certainly, although in a lesser degree, indicated by the thermometer. In the winter and spring months, the north and east winds

may be considered as having a temperature 6° or 8° lower than the south and west winds; and this is so constant a circumstance that the change of the temperature is as regular as the change of the wind; that is, if the wind continues in its new direction for one or more days. The change of temperature is most remarkable when the wind is high, and in this case, if the wind shifts suddenly, and continues still high, the change of temperature is very considerable in a short time. As this subject is rather curious and interesting, and has been too little attended to by writers on meteorology, I shall here give a short account of the more remarkable instances of these changes that have occurred during the winter and spring months of the two last years.

1818. In *January*, at the beginning of a gale from the east, the thermometer was 45°; the following day it was 40°, and on the third, when the gale was at its height, it was 39°. In the same month with a moderate wind from the west, the thermometer stood at 46°; on the following day this shifted a little to the southward of west, and encreased to a pretty strong gale which lasted four days; during this gale the thermometer stood at the average of 52°; on the fifth day the wind moderated and shifted to the N. W. when the thermometer fell to 43°.

In *February* in a brisk wind from the S. E. the thermometer stood at 45°. The wind continued high for four days, but gradually veered round, by the S., to the S. W., and then to the N. W.: following

the changes of the wind the mercury rose to 53°; and finally fell to 40°.

In *December*, the wind being N. E. and very gentle, the thermometer stood at 37°; next day it changed to the S. W. and blew a moderate gale, when the thermometer rose to 47°; this continuing, with increased violence, the thermometer next day rose to 50°; on the following day the wind getting moderate and changing to the eastward, the thermometer began to fall, and on the next day, the wind being then N. E., it stood at 41°. In the same month a change from a slight breeze from the west, to a gale from the S. W. raised the thermometer from 47° to 53° in the course of one day; and it fell to 41° on the wind moderating and coming round to its original point.

1819. In *January*, in a moderate breeze from the E. the thermometer stood at 43°; in the course of the two following days the wind shifting to the S. E. it rose to 47°; in the two following, the wind becoming quite southerly and blowing strong, the thermometer rose to 53°.

In *February*, in a gentle breeze from the N. the thermometer was 45°; next day the wind shifted to the S. W. and blew a good breeze, when the mercury rose to 50°; on the following day the wind being high from the same quarter, it rose to 54°;—the wind (still high) then shifted round to the N. W. and the mercury fell to 49°.

In *March*, for the first 13 days the wind was moderate from the E. and N. E., and the average of the

thermometer was 43°; on the three next days there was a brisk breeze from the N. W., during which the average of the thermometer was 46°; during the remainder of the month (15 days) the wind was either S., S. W., or W., and blew a brisk breeze,—and the average height of the thermometer was 51°.

In *October*, from the 1st to the 15th, the wind was in general brisk, on two days it blew a strong gale, and during the whole time continued either S. or S. W.; the average of the thermometer was 59°. The wind then shifted to the N. and E., at which points it continued for the remaining 16 days of the month (with the exception of 2 days to the N. W.) and the thermometer fell to the average of 48°.

In *November*, for 11 days the wind was northerly and easterly, sometimes blowing very strong from the N. W. and S. E.;—at this time the average height of the thermometer was 43°; it then shifted to the S. W. for 2 days, and then to the S., during which three days it blew a strong gale, and the mercury rose to 52°.

December was a very windy month. For 9 days the wind was northerly and easterly, the average height of the thermometer being as low as 36°; on the 10th day the wind shifted to the W. and the mercury rose to 43°; on the following day there came on a strong S. W. gale, which lasted 6 days, during which the average height of the mercury was 54°; the gale still continuing, but the wind changing to the N. W. for 2 days, and then to the N. E., the mercury fell on the first day to 44°, on the second to 39°, and on the third to 37°.

These details very satisfactorily account for the relative temperature of our winter and spring months. It has been already shown from Table III, that the north and east winds (including the S. E.) prevail by *one fourth* more, in the months of March, April and May, than in the three preceding months; and we have just seen that the winds from these quarters are capable of producing a very marked reduction of the temperature of this district. The proportion of the N., N. E., and E. winds, in the two seasons, for the first eleven years of our period is as follows:—

1.	Winter (Nov. Dec. Jan) - -	34
	Spring (Feb. Mar. Apr.) - -	35
2.	Winter (Dec. Jan. Feb.) - -	28
	Spring (Mar. Apr. May.) - -	41

What makes the great difference between these two statements is the circumstance of the N. and E. winds being very little prevalent in February, and much more prevalent in May than in October.

Although, as I have said, the direction of the winds in spring sufficiently accounts for the low temperature of that season, still the effects indicated by the thermometer are much less than our sensations would lead us to expect. Probably the hygrometer, by indicating the very superior *dryness*, and consequently superior *evaporating power* of the east winds, might enable us to come to a more decided opinion respecting their very singular, and very disagreeable, influence on our sensations.

During the prevalence of the south or south-west gales, there is very little difference of temperature between the day and night, as proved by the register-thermometer. Sometimes there is no difference whatever; and very commonly the minimum of the night is not more than 3° or 4° below the maximum of the day. This shows how very completely the influence of the sun is excluded by the dense vapour with which the air is loaded; and during these *our moist siroccos*, we may say, without any metaphor, that we are breathing the breezes of a climate milder than our own. When these south and south-west winds, so prevalent in winter, are very gentle, the sky is often clear for many days together. On these occasions, the warmth and softness of the air are truly delightful; and when, taken in conjunction with the beautiful scenery around Penzance.—the calm blue bay,—the gay green meadows,—the myrtles and other exotic plants common in our shrubberies,—one is almost tempted to forget that it is a British, and a winter landscape that he is contemplating.

In Mr. Giddy's register, there are two columns denoting high winds, the one marked *windy*, the other *stormy;* the former term expressing simply high winds, the latter very severe gales, generally accompanied by rain, &c. Of the former days the mean annual number is stated at 34, of the latter 12. The winter and spring months are the most windy, and it is in them principally that the stormy days occur. October, November and December, are the three most

stormy consecutive months; October is recorded as the most stormy; June, July and August, as the least; and they are nearly equally so. The following are the number of stormy days that have occurred during the last fourteen years, arranged according to the months in which they occurred:—

	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
No. of days	27	16	21	14	5	2	4	4	10	32	25	22

And the following are the number of stormy days during the last three years, arranged according to the quarters whence the wind blew:—

	S. E.	N. W.	S. W.	S.	W.
No. of days - -	21	19	13	6	2

Our most frequent gales are from the south-east, but our most severe are from the north-west; and these are much felt all over this district, there being no high land to break their force.

As confirming and illustrating some of the peculiarities of climate above detailed, I shall now briefly notice a few particulars respecting the vegetable products of the country; as, after all, there can be no doubt that the character of a climate is much more faithfully indicated by such natural tests, than by any instrumental, or artificial, means whatever.

1. The great mildness of the winter season, in this district, is evinced by the growth, in the open air, of several plants which are either not natives, not cultivated, or are inmates of the green-house, in most other parts of England. In the Appendix I

have given a list of the rarer indigenous plants of this district, among which I may particularise the *Sibthorpia Europæa* as strikingly evincing the superiority of our winter temperature. This elegant little plant when transplanted into the middle counties is killed down in the winter, even in a sheltered garden. The *Tamarix Gallica* may likewise be mentioned, although this is a much more hardy plant than the former.

In the Appendix I have also given a list of the tender Exotics which are common in our shrubberies; among which the Botanist will find several, growing here without shelter, which are green-house plants in most other parts of England. On this occasion I may remark, that if ornamental horticulture was as much attended to in this neighbourhood as in many other parts of England, there can be no doubt that our list of tender Exotics, thriving in the open border, would be greatly increased. Among the most conspicuous of our Exotics is the Myrtle, which, even in its extreme shoots, is rarely injured by the cold of winter. All its common varieties, broad and narrow leaved, single and double, thrive equally well and flower plentifully. In the open garden these plants attain the height of ten or twelve feet, and they may be seen trained on the front of some of the houses in Penzance, to double that height. Geraniums are also common in our borders, but many of these, in several places, were killed down to the ground last winter. The Hydrangea seems as hardy

as a native, and attains an immense size, as does also the Verbena Triphylla. From the list of Exotics I may further adduce the following, as striking instances of our mild climate: *Amaryllis Vittata, Canna Indica, Mesembryanthemum Deltoideum, Protæa Argentea, Calla Æthiopica.* The great American Aloe *(Agave Americana)* has flowered in the open air at Mousehole, two miles from Penzance; at Tehidy Park, and in the Scilly Islands. This has also twice happened at Salcombe, in Devonshire.

2. The progress of vegetation is so little checked during the winter months, that the meadows always retain their verdure, and in milder seasons afford even a considerable supply of grass to cattle.

3. It is customary for the gardeners and small farmers in the vicinity of Penzance to raise two crops of Potatoes in one year. The first crop is planted in November, and is gathered in April, May and June; the second crop is planted immediately on taking up the first, and as late as to the middle of July, and is gathered in time to allow the preparation of the ground for the succeeding crop. The first or spring crop, has, in general, no defence from the cold of winter but the stable dung used for manure; and it is a very rare thing for it to be injured by the frost. The above is the state of things with those who supply our market; but my friend Mr. Bolitho, of Chyandour, has constantly new Potatoes at christmas, and through the whole of January and part of February, raised in the open garden, with

no other shelter than that afforded by some matting during the coldest nights.

4. In consequence of the two circumstances just mentioned, the rent of land in the immediate vicinity of Penzance is remarkably high,—being very commonly from £10. to £12., and occasionally as much as £15.* per acre. Not many years ago higher rents than even this were given.

5. Cabbages and Turnips for the table are also earlier here than elsewhere; the former being ready in the middle of February, and the latter in the end of March. Cabbages, indeed, as they are quite unaffected by the winter cold, may be so regulated as to be cut in any month of the year. The Cabbage in general use here (the Paington, or early Cornish) is often killed by the severity of the winter in the midland counties. Brocoli is often ripe against christmas; Radishes against the first of April.

6. Owing to the comparative coldness of our late spring months and early summer months, vegetation is less rapid after it commences than in other parts of the island. The trees in the vicinity of London, for example, are in full foliage some time before they are with us, even in our most sheltered vallies. The same remark is applicable to many of our garden shrubs and flowers.

7. The very low temperature of our summers, and our want of sufficient sun-shine, prevent many of our fruits from attaining that richness of flavour,

* The Cornish acre is one sixth more than the statute acre.

and security of full maturation which they possess in the inland counties. The vine very rarely ripens its fruit in the open air; and our wall fruits in general, are, I apprehend, inferior in point of flavour to that of the inland counties, especially the Peach.

8. The Apricot rarely produces any fruit, except in a few places, and then very scantily. The green gage Plum is nearly equally unproductive. The Walnut, and common Hazel-nut very seldom bear fruit in this neighbourhood; although the latter is much more productive a few miles more to the eastward—more in the interior. Whether the failure of all or either of these last mentioned fruits be owing to the same cause, or to different causes; or what these are, I am not well assured. Apples for the table, and Strawberries are particularly plentiful and good.

9. A further consequence of our cool summers is the comparative lateness of our harvests. This is not very considerable, yet it is sufficiently obvious when compared with some of the other southern counties of England. From an account now before me, of the date at which harvest commenced on the farm of my friend Mr. Tremenheere, at Roscadghill, in the immediate vicinity of Penzance, for the last seventeen years, it appears that the average period of commencement is the 12th of August; the earliest (which is the present year) is the 3rd, and in one year (1817) it was as late as the 27th. In Table VII. I have given these dates for each year, with the view

of ascertaining whether, and how far, the temperature of different years and seasons has effect in accelerating or retarding the ripening of the crops.

10. Cornwall, like Scotland, is proverbial for its want of trees; and is more excusable than Scotland; for there they will grow if planted, here, in many cases, they will not. All the western district of Cornwall, on the high grounds and exposed uplands, is nearly destitute of trees. In close and sheltered vallies they grow very well. Almost all sorts of shrubs grow exceedingly well every where, and also young trees until they attain a certain height. Such trees as grow to a height beyond that of shrubs, in exposed situations, are all stunted; and this is the case with the common hedge-thorn used for fences. All trees in exposed situations, whether high or low, have their branches directed towards the east by the prevailing westerly winds. The only tree that seems to disregard the injurious effects of the climate, in high and exposed situations, is the Pinaster Fir (Pinus Pinaster). The Scotch Fir (Pinus Silvestris) is as much injured in exposed situations as other trees. These and other circumstances, I think, prove that it is to the physical, rather than the chemical qualities of our atmosphere, that the deficiency of trees is owing. Wherever trees are protected from the direct impetus of the sea breezes (and all ours are sea breezes), whether by walls, hills, or other trees, they will grow well and thrive; wherever they are not so protected, they will certainly not thrive, often

they will not grow. It is, indeed, true, that, in many of our more elevated situations, the want of sufficient depth of soil to receive the roots, is an additional obstacle to the growth of trees. Still, it is evident, that in general it is the climate, and not the soil, that is in fault.

For the following instances from the animal kingdom, illustrative of our mild seasons, I am indebted to my friend the Rev. W. T. Bree, of Allesley, Warwickshire; the same intelligent naturalist who furnished me with the list of our rarer indigenous plants given in the Appendix. I extract Mr. Bree's own words from his letter:—

11. "One of the most remarkable instances of the mildness of your climate, is the unusually early appearance of Frog's spawn: this I observed at Gulval on the 8th of January. According to White's Naturalist's Calendar (which was made from observations taken in Hampshire, a warm and early county), the earliest and latest appearances there specified, are February 28th and March 22nd. Taking, therefore, the 2nd week in March as the average for its appearance, you should seem in this instance, to be full two months earlier than Hampshire. I need not observe to you that White was an accurate and most observant Naturalist."

12. "In this neighbourhood (near Coventry), I rarely see any of our species of Swallow (except perhaps an occasional straggler), before the second week in April; but in 1818 I was not a little gratified

at observing upwards of a score of Sand Martins (Hirundo Riparia) sporting over the marsh between Gulval and Marazion on March 31st. The wind at that time was N. W. and the thermometer at 50° in the shade at noon. White, indeed, mentions the 21st March as the earliest appearance of the Sand Martin (in Hampshire I conclude). But fo my own part, though I have long been an attentive observer of the arrival and departure of our British Hirundines, I never but once ('till I was in Cornwall) saw an individual of this genus so early as the 3rd of April. This was a single bird of the species Hirundo Rustica."

13. "The Chaffinch (Fringilla Cœlebs) I heard in Cornwall begin to chirp his spring note the last day of December. Here with us he is seldom heard 'till the beginning of February or end of January."

14. "The Viper (Coluber Berus) a great lover of warmth and moisture, occurs more frequently in Cornwall than in the midland counties."

APPENDIX.

(A)

LIST OF SOME RARER INDIGENOUS PLANTS IN THE LAND'S END DISTRICT.

Pinguicula Lusitanica (Pale Butterwort). Bogs in this neighbourhood.

Utricularia Vulgaris (Common Bladderwort). Between Rosemorran and Kenegie.

Salvia Verbenaca (Wild English Clary). St. Ives, Scilly Islands.

Iris Fœtidissima (Stinking Iris—Roast-beef Plant). Madron, &c.

Scirpus Fluitans (Floating Club-rush). In the Marsh, Gulval.

Panicum Dactylon (Creeping Panick-grass). Beach between Penzance and Marazion, in a line with Gulval Church.

Briza Minor (Small Quaking-grass). Corn-fields between Gulval and Ludgvan, plentifully.

Rubia Peregrina (Wild Madder). Hayle, Helston, &c.

Exacum Filiforme (Least Gentianella). In the Marsh between Penzance and Marazion, beyond the half-way houses.

Anchusa Officimalis (Common Alkanet). St. Ives.

Convolvulus Soldanella (Sea Bindweed). White and Bay, &c.

Campanula Hederacea (Ivy-leaved Bell-flower). Trevayler Bottom, Gear Stamps, and New Mill, &c.

Verbascum Nigrum (Dark Mullein). Gulval.

Chironia Littoralis (Sea Centaury). Beach between Penzance and Marazion.

Samolus Valerandi (Brook-weed or Water Pimpernel). Land's End, &c.

Illecebrum Verticillatum (Whorled Knotgrass). Gear Stamps, Land's End, Gulval, &c.

Herniaria Hirsuta (Hairy Rupture-wort). Between Mullyon and the Lizard.

Cuscuta Epithymum (Lesser Dodder). Common upon Gorse.

Gentiana Campestris (Field Gentian). Downs, Whitesand Bay, Lizard, &c.

Eryngium Maritimum (Sea Holly). Sea-shore common.

Daucus Maritimus (Wild Carrot). Land's End, Logan Stone, Botallack Mine, St. Ives, &c.

Tamarix Gallica (French Tamarisk). The Mount, Lizard, Scilly Islands, (but apparently introduced).

Drosera Longifolia (Long-leaved Sun-dew). Marsh between Penzance and Marazion.

Ornithogalum Umbellatum (Common Star of Bethlehem). Near Marazion.

Scilla Verna (Vernal Squill). St. Ives plentiful, near Zennor, Morvah, opposite to Three Stone Oar.

Rumex Sanguineus (Bloody-veined Dock). Gulval.

Alisma Damasonium (Star-headed Water Plantain). Between Penzance and Marazion.

Erica Vagans (Cornish Heath). Near the Lizard, Soap Rock, Kinance Cove, between Helston and Mullyon.

Saponaria Officinalis (Soap-wort). St. Levan, Tresco Island, Scilly.

Silene Anglica (English Catchfly). Very common in corn fields.

Arenaria Verna (Vernal Sandwort). Kinance Cove.

Sedum Telephium (Orpine or Livelong). Logan Stone.

——— *Anglicum* (English Stonecrop). Very common in this neighbourhood.

Spergula Nodosa (Knotted Spurrey). Near Marazion.

Euphorbia Portlandica (Portland Spurge). Brehar Island, Scilly.

——————— *Paralia* (Sea Sponge). Scilly Islands.

Spiræa Filipendula (Common Dropwort). Kinance Cove.

Glaucium Luteum (Yellow Horned-Poppy). Scilly Islands.

Aquilegia Vulgaris (Common Columbine). St. Ives, Lelant, &c.

Helleborus Viridis (Green Hellebore). Between Rosemorran and Kenegie, near the brook.

Mentha Rotundifolia (Round-leaved Mint). Between Penzance and Newlyn. Whitesand Bay.

Stachys Arvensis (Corn Woundwort). Corn fields very common.

Scutellaria Minor (Lesser Skull-cap). Bogs Gulval.

Bartsia Viscosa (Yellow visced Bartsia). Bogs in this neighbourhood, common. Corn-fields near Hayle.

Antirrhinum Orontium (Lesser Snapdragon). Gulval, Land's End, Brehar Island, Scilly.

Scrophularia Scorodonia (Balm-leaved Figwort). St. Ives, Gulval and Chyandour plentifully. Within the ruins of the Abbey, Tresco Island, Scilly.

Sibthorpia Europæa (Cornish Moneywort). Moist banks, common in this neighbourhood.. Gulval, Maddern Well, Trereife Road-avenue, Helston.

Cochlearia Officinalis (Common Scurvy-grass). Cliffs near the sea, common.

——*Anglica* (English Scurvy-grass). Gulval, Penzance.

Bunias Cakile (Sea Rocket). Beach between Penzance and Newlyn.

Brassica Oleracea (Sea Cabbage). Cliffs Penzance, (perhaps introduced).

Erodium Maritimum. (Sea Stork's-bill). Sea-shore common.

—— *Cicutarium* (Hemlock Stork's-bill). Sea-shore common.

Geranium Sanguineum (Bloody Crane's-bill). Kinance Cove.

—— *Columbinum* (Long-stalked Crane's-bill). Ludgvan.

Genista Pilosa (Hairy Greenweed). Kinance Cove.

Anthyllis Vulneraria, (dwarf with a red flower) (Kidney-Vetch. Ladies'-finger). Downs Whitesand Bay.

Ornithopus Perpusillus (Common Bird's-foot). Gulval Carne, &c.

Trifolium Subterraneum (Subterraneous Trefoil). Near the sea-shore.

—— *Scabrum.* (Rough Trefoil). Near the sea-shore.

Hypericum Androsœmum (Tutsan. Parkleaves). Gulval. Trevayler bottom, &c.

Solidago Virgaurea (Common Golden-rod). Penzance, &c.

Inula Helenium (Elecampane). Gulval, the Mount, St. Mary's Scilly, St. Ives.

Pyrethrum Maritimum (Sea Feverfew). Sea-shore.

Anthemis Nobilis (Common Chamomile). Common in this neighbourhood.

Orchis Pyramidalis (Pyramidal Orchis). Near Hayle.

Neottia Spiralis. Between Penzance and Marazion.

Ruscus Aculeatus (Butcher's Broom). Lemorna Cove, St. Martin's Island, Scilly.

Myrica Gale (Sweet Gale. Dutch Myrtle). Marsh, Gulval and Ludgvan.

Osmunda Regalis (Royal Moonwort). Common in moist places.

Aspidium Oriopteris (Heath Shield-fern). Gear Stamps and New Mill.

—— *Dilatatum Variety* (Great Crested ditto). Moist banks in this neighbourhood.

Asplenium Marinum (Sea Spleenwort). Cliffs near the sea, St. Michael's Mount, Land's End, &c.

——— *Lanceolatnm* (Lanceolate ditto). Gulval, St. Michael's Mount, Lemorna Cove, &c.

Hymenophyllum Tunbridgense (Filmy-leaved Fern). Among the loose stones at Castle An Dennis, on the east side.

Dicranum Cerviculatum (Red-necked Forked-Moss). Gulval, Scilly Islands.

——— *Crispum* (Curled ditto). St. Mary's, Scilly.

Trichostomum Polyphyllum (Fringe-Moss). Gulval about Kenegie, Land's End, &c.

Neckera Heteromalla (Lateral Neckera). Trevayler bottom, Try, &c.

Hypnum Scorpioides (Scorpion Feather-Moss). Gulval, Zennor, Land's End.

—— *Alopecurum Variety* (Fox-tail ditto). Gulval.

Hookeria Lucens (Shining Membranaceous ditto). Trevayler Bottom. Between Rosemorran and Kenegie, &c.

THE FOLLOWING ARE CHIEFLY FROM RAY.

Mentha Odorata (Bergamot Mint). Burian.

Antirrhinum Repens (Creeping Toadflax). Near Penryn

Polygonum Aviculare (Knot-grass). Castle Treryn.

Asparagus Officinalis (Common Asparagus). Lizard.

Gnaphalium Luteo-album (Jersey Cudweed).

Cynosurus Echinatus (Rough Dog's-tail Grass) Ludgvan.

Euphorbia Peplis (Purple Spurge). Between Penzance and Marazion.

Santolina Maritima (Sea Cotton weed).

Saxifraga Stellaris (Hairy Saxifrage). Logan-rock.

Asplenium Marinum (Sea Spleenwood). Ditto.

Linum Angustifolium (Narrow-leaved pale Flax). St. Ives.

(B)

LIST OF SOME OF THE TENDERER EXOTICS GROWING IN THE OPEN AIR, IN THE NEIGHBOURHOOD OF PENZANCE, 1820.

*Agave Americana.
Amaryllis Vittata.
Arum Colocasia.
Azalea Indica.
Buddlœa Globosa.
Bocconia Cordata.
Coronilla Glauca, &c.
Calla Æthiopica.
Cistus Salvifolius.
Chrysanthemum Indicum.
Camellia Japonica.
Cyclamen Persicum.
Canna Indica.
Cheiranthus Tristis.
Dahlia (many varieties).
Daphne Indica.
*Dracocephalum Canariense.
Eucomis Striata.
Fuchsia Coccinea.
Geranium (several species of the African G.)
Hypericum Coris.
——— Crispum.
Hypericum Balearicum.
Hydrangea Decolor.
Haustonia Coccinea.
Hemerocallis Alba.
Lavandula Viridis.
Lobelia Fulgens.
Myrtus Communis.
Mesembryanthemum Deltoideum.
Melianthus Major.
Mimulus Glutinosus.
Magnolia Tripetala.
Metrosideros Lanceolata.
Olea Fragrans.
Pittosporum Undulatum.
Phylica Ericoides.
Protœa Argentea.
Punica Nana.
Solanum Pseudo-Capsicum.
Teucrium Frutescens.
———Marum.
Verbena Triphylla.
Westringia Rosmarinacea.

* Not growing at present.

METEOROLOGICAL TABLES.

TABLE I.

TEMPERATURE OF PENZANCE.

14 years, 1807 to 1820.	Farenheit's Thermometer.										
	Mean Temp.			Extreme Temp.				Variation of Temperature.			
	At 7 a. m. *	At 2 p. m.	At 7 & 2.	Actual max.	Actual min.	Mean of max.	Mean of min.	Monthly range.	Daily range.†	Mean of the greatest variations of successive days, 4 years.	Mean variation of succes sive days, 5 years.
Jan.	40	44	42	56	19	52	27	22	8	10.5	3.74
Feb.	42	48	45	58	26	54	33	21	12	10.	3.26
Mar.	42	50	46	62	28	58	32	26	16	10.5	3.15
Apr.	46	55	50	68	32	63	40	26	18	8.	2.52
May	53	62	58	74	42	69	46	23	18	5.6	2.09
June	58	66	62	78	45	73	52	21	16	5.6	1.61
July	60	68	64	78	52	74	56	18	16	5.0	1.46
Aug.	59	67	63	78	50	72	54	17	16	4.6	1.27
Sep.	56	63	60	74	42	69	49	20	14	9.2	2.55
Oct.	51	57	54	68	37	64	41	22	12	9.	3.02
Nov.	45	50	48	69	28	57	36	21	10	11.25	3.18
Dec.	42	45	43	58	22	54	29	25	6	12.5	4.41
Mean	50	56	53			63	41	21	13	8.64	2.68

Greatest annual range - 55°.
Least annual range - - 46°.
Mean annual range - - 49°.

* The time of observation in December and January was 8 o'clock.

† This column is constructed by comparing the two first of this Table and doubling the difference.

TABLE II.

Atmospheric Pressure & Rain at Penzance & Calenick.

Calenick 1811-16, Penz. 1818-19.	Barometer.						Rain in inches.		
	Calenick.		Penzance.		Both places.		Penz. 1819-20	Calen. 1811-16	Mean of both.
	Mean.	Range	Mean.	Range	Mean.	Range			
Jan.	29.63	1.45	29.67	1.36	29.65	1.40	2.64	2.98	2.81
Feb.	29.74	1.12	29.58	1.07	29.66	1.09	1.88	2.87	2.37
Mar.	29.82	1.28	29.56	1.08	29.69	1.18	.78	1.87	1.32
Apr.	29.73	1.02	29.41	.94	29.57	.98	.91	1.83	1.37
May	29.79	.86	29.61	.60	29.70	.73	1.88	1.85	1.86
June	29.87	1.05	29.74	.67	29.80	.86	1.40	2.31	1.85
July	29.91	.69	29.78	.76	29.89	.72	1.01	1.97	1.49
Aug.	29.99	.73	29.75	.68	29.87	.70	1.30	1.52	1.41
Sept.	29.93	.76	29.59	.99	29.76	.87	1.59	2.15	1.87
Oct.	29.67	1.21	29.60	.94	29.63	1.02	1.81	4.24	3.02
Nov.	29.74	1.25	29.54	.94	29.64	1.09	2.86	3.18	3.02
Dec.	29.73	1.30	29.65	1.14	29.69	1.22	2.51	2.98	2.74
Mean	29.79	1.06	29.62	.93	29.71	.98	20.57	29.73	25.13

TABLE III.

Monthly state of the Weather at Penzance.

1807 to 1820.	Weather. Number of Days.					Winds. Number of Days.			
	Dry.	Wet.	Snow.	Hail.	Thunder.	N. & N.E.	E. & S. E.	S. & S. W.	W. & N. W.
Jan.	14.21	15.64	.50	.71	.21	6.50	6.71	6.78	10.21
Feb.	12.92	14.14	.64	.85	.44	4.57	4.14	8.71	10.78
Mar.	17.92	11.35	.35	.92	.35	6.78	8.00	6.92	8.92
Apr.	19.71	9.71	.14	.64	.07	7.42	8.42	7.14	7.00
May	17.07	13.42		.14	.21	6.00	8.00	10.60	7.00
June	20.	9.07		.14	.28	6.35	4.85	6.92	11.28
July	19.28	11.57			.21	6.07	5.00	8.78	11.00
Aug.	18.42	12.78			.28	6.28	3.71	10.35	10.78
Sept.	18.07	11.71			.14	6.35	7.71	7.14	8.78
Oct.	15.57	14.71		.64	.21	4.42	7.64	10.35	8.71
Nov.	12.64	16.85	.07	.50	.07	6.14	6.14	7.71	10.14
Dec.	12.57	16.64	.44	1.50	.07	6.21	5.92	7.00	11.57

TABLE IV.

Annual State of the Weather at Penzance.

Years.	Weather. Number of Days.					Winds. Number of Days.			
	Dry.	Wet.	Snow.	Hail.	Thunder.	N. & N. E.	E. & S. E.	S. & S. W.	W. & N. W.
1807	215	132	5	9	4	84	50	109	122
1808	217	134	7	6	2	68	84	92	121
1809	190	167		5	3	60	77	104	124
1810	212	150		1	2	69	75	121	100
1811	177	181	3	2	2	73	63	135	94
1812	199	164	1		2	75	87	99	104
1813	207	153		3	2	86	77	91	111
1814	225	134	4	1	1	64	84	109	108
1815	192	157	4	11	1	75	68	110	112
1816	187	169		9	1	80	67	83	135
1817	187	171	1	4	2	84	64	92	125
1818	191	174	3	8	4	51	101	83	130
1819	184	181	2	19	7	88	75	77	125
1820	221	144	6	12	3	63	95	78	129
Mean	200.35	157.92	2.57	6.42	2.57	72.85	75.50	98.78	117.14

N. B. Under the column *wet days,* are included all the days wherein any rain fell.

TABLE V.

Comparative View of Mean Temperature at different Places in Great Britain.

	Time of observation.	Mean Temperature.												Mean Temp.					Var. of Temp.§§	
		Winter.			Spring.			Summer			Autumn									
		Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Winter.	Spring.	Summer.	Autumn.	Whole year.	Annual range.	Mean variation of successive months.
	a m.																			
Isle of Wight, 10 yrs. (1809–1818)*	9	44	39	37	41	44	46	56	62	65	62	58	51	40	43	61	57	50	25	4.66
†Penzance, 14 yrs. (1807-1820)‡	8†	45	42	40	42	42	46	53	58	60	59	56	51	42	43	57	55	50	19	3.33
Sidmouth, 2 years (1813-1814)§ -	8	44	41	34	40	43	50	54	60	64	63	59	50	39	44	59	57	50	30	5.00
Exeter, 5 years (1814–1818)‖ - -	8	43	37	34	38	41	44	51	57	59	57	53	47	38	41	55	52	46	25	4.16
Gosport, 4 years (1816–1819)** -	8	43	37	39	39	41	46	52	60	62	61	57	49	39	42	58	55	48	25	4.16
London, 3 years (1817–1819)†† -	8	45	36	38	39	40	45	52	59	61	60	56	48	39	41	57	54	48	25	4.16
Kinfauns, 6 years (1813–1818)‡‡	8	39	34	32	36	37	42	48	54	57	55	51	44	35	38	53	50	43	25	4.16

* Original journal by — Kirkpatrick, Esq.

† I have stated the time here at 8, a. m. but the observations were taken at 7, a, m, in all the months except December and January, Of course, some allowance ought to be made on account of the earlier (and colder) period of observation at Penzance.

‡ Original journal by T, and E, Giddy Esqrs.

‖ Original journal by E. P. Pilcher Esq.

†† Mr. Cary, in Philosophical Magazine.

§ Dr. Clarke, in Annals of Philosophy.

** Dr. Burney, in Annals of Philosophy.

‡‡ Thomson's Annals.

§§ These two columns are formed from the mean temperature as given in the preceding part of the Table.

TABLE VI.

Comparative Temperature of Penzance and Calenick.

Mean of the same 5 years (1811–1816) at 8 a. m., and 2 p. m.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mean.
Penzance -	40	45	46	51	59	61	63	63	60	54	48	44	52.83
Calenick -	38	45	47	52	58	62	65	63	61	55	47	43	53.

N. B. In this, as in the other Tables, the morning observation at Penzance is at 7 a. m., with the exception of December and January.

TABLE VII.

Comparative Temperature of different Years and Seasons at Penzance for the last 14 Years.

Years.	Mean Temperature at 7 and 8 a. m.					Harvest begun at Roscadghill.*
	Winter.	Spring.	Summer.	Autumn.	Whole Year.	August.
1807	41.	43.	58.	54.	49.	17th
1808	42.	39.	57.	54.	48.	16
1809	43.	42.	56.	54.	49.	18
1810	42.	43.	56.	56.	49.	20
1811	43.	44.	55.	55.	49.	12
1812	42.	42.	57.	56.	49.	13
1813	42.	44.	57.	55.	50.	21
1814	42.	42.	57.	55.	49.	10
1815	41.	48.	59.	57.	51.	14
1816	42.	42.	55.	55.	48.	5
1817	46.	45.	55.	53.	50.	27
1818	47.	43.	61.	58.	52.	8
1819	42.	46.	57.	58.	51.	5
Mean	43.15	43.88	57.40	55.88	50.	14

* The land at Roscadghill has chiefly a northern aspect.

TABLE VIII.

Comparative Fall of Rain in different Places, from recent observations.

Places, and Period of Observation.	Quantity of Rain in inches.
Calenick, (6 years, 1811–1816) - - - -	29
Penzance, (2 years 1819–1820) - - - -	21
Exeter, (3 years, 1817–1819) - - - - -	29
Plymouth, (2 years, 1815–1816) - - - -	31
Sidmouth, (1 year, 1814) - - - - - -	25
Isle of Wight, (8 years, 1811–1818) - - -	36
Gosport, (4 years, 1816–1819) - - - -	30
Croydon, (3 years, 1817–1819) - - - -	25
Tottenham, (6 years, 1811–1816) - - - -	24
Manchester, (1 year, 1819) - - - - - -	35
Lancaster, (7 years, 1809–1815) - - - -	38
New Malton, (Yorkshire) (3 yrs. 1817–1819)	30
Edinburgh, (2 years, 1811–1812) - - - -	29
Bothwell Castle, (3 years, 1810–1812) - -	27
Glasgow, (3 years, 1810–1812) - - - -	24
Largs, (Scotland) 3 years, 1810–1812) - -	43
Gordon Castle, (Scotland) (3 yrs. 1810–1812)	29
Kinfauns, (Perthshire) (7 years, 1813–1819)	27
Cork, (Ireland) (2 years, 1818–1819) - - -	38

POSTSCRIPT.

With the view of further illustrating the equability of our temperature (see page 17), I subjoin the following results for last month (November, 1820);—those for Edmonton taken from Mr. Adams's Diary

in the Literary Gazette;—those for Derby, from Mr. J. T. Swanwick's, in the Derby Mercury.

	Penzance.	Edmonton.	Derby.
Absolute max. - - -	56°. —	58°. —	54°.
——— min. - - -	35°. —	22°. —	25°.
Mean of max. - - -	50°. —	47°. —	45.9°.
——— min. - - -	44°. —	35°. —	35.9°.
Mean of both, - - -	47°. —	41°. —	40.9°.
Extreme monthly range	21°. —	36°. —	29°.
Diurnal Range { Max.	13°. —	25°. —	
Diurnal Range { Min.	1°. —	3°. —	
Diurnal Range { Mean	6°. —	12°. —	

I also subjoin a Table of the mean morning temperature of the three coldest months at Nice, Pisa, and Rome, (extracted from Dr. Clark's late excellent work on the climate and diseases of France and Italy,) compared with that of Penzance for the same years. This statement will show the difference of temperature between these places and Penzance to be much less, I think than might have been anticipated from considering the difference of geographical position; certainly much less than had been conceived by myself before examination.

Farenheit's Thermometer.	Time of observation.	Dec.	Jan.	Feb.	Mean	Extreme range	Absolute Max.	Absolute Min.
Nice, 3 yrs. (1815–1817)	sun-rise	44	44	47	45	33	63	30
Pisa, 3 yrs. (1814-1816)	sun-rise	42	40	43	41	40	60	20
Rome, 3 yrs. (1815–1817)	7 a. m.	42	41	43	42	37	64	27
Penz. 3 yrs. (1815–1817)	7&8 a.m.	42	41	44	42	36	58	22

ERRATA.

Page 20, line 2 from bottom. For *above* read *below*.
—— — last line. Dele "*and autumn are*" read *is*.
—— 41, line 19. For *October* read *November*.

Finis.

Vigurs, Printer, Penzance.