The climate of the south of Devon : and its influence upon health, with short accounts of Exeter, Torquay, Babbicombe, Teignmouth ... / By Thomas Shapter, M.D.

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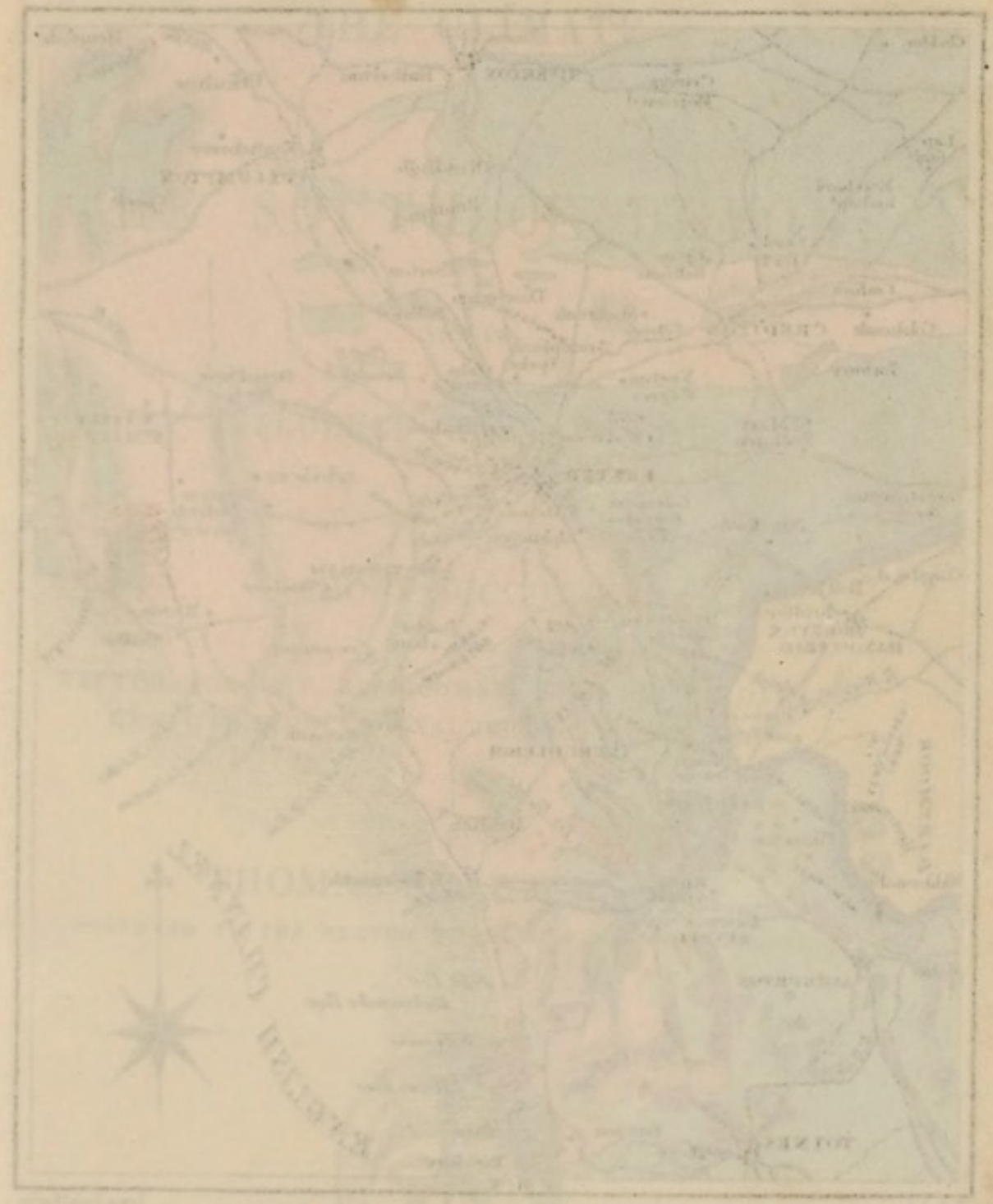

GEOLOGICAL MAP OF SOUTH DEVON.

The words in this character (MANGANESE.) refer to mineral deposits or the habitats of other natural productions. The numerals designate the height at which the places so marked are above the level of the Sea.

BLACK	BOVEY COAL	GRAUWACKE SLATES	LIGHT BLUE
LIGHT GREEN	GREEN SANDSTONE	CARBONACEOUS SCHIST	DARK BLUE
DARK RED	RED SANDSTONE	CODDON HILL GRIT	PURPLE
BROWN	TRAP ROCKS	GRANITIC GREEN STONE	DARK GREEN
VERMILION	LIMESTONE	GRANITE	YELLOW

THE CLIMATE

OF

THE SOUTH OF DEVON;

AND ITS

INFLUENCE UPON HEALTH:

WITH

SHORT ACCOUNTS

OF

EXETER, TORQUAY, BABBICOMBE, TEIGNMOUTH, DAWLISH,
EXMOUTH, BUDLEIGH-SALTERTON, SIDMOUTH, &c.

BY

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&c. &c.

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TO

SIR THOMAS DYKE ACLAND, BART., M.P.

"TRUE TO VIRTUE AND AS WARM AS TRUE,"

THIS LITTLE VOLUME

IS

Dedicated.

PREFACE.

The following pages were written in accordance with the suggestion of Sir James Clark, that, in order to determine the true character of the climate of the south-western part of England, observations should be made in some of its principal localities. Drs. Carrick and Symonds have, as far as their resources would permit, illustrated the climate of Bristol and Clifton, and Dr. Forbes has contributed an essay on the Medical Topography of the Land's End, which may be quoted as more than ordinarily valuable; the present volume is offered as another link to this chain of information.

The sources, whence the chapter on Climate is composed, are registers kept by Dr. Barham in the parish of St. Leonard, by Mr. White of St. Thomas, Mr. Ponsford surgeon to the Lunatic Asylum, and Mr. Squance librarian to the Exeter Institution; the averages have chiefly been deduced from the latter; those of rain, however, are calculated from the register kept at the Asylum, which I believe, from local circumstances, to give a truer statement of the fall proper to the district.

The chapter on Geology, which is intended to be only a very general and condensed description of

the formations of the district, contains the substance of a paper read before the Philosophical Society of Exeter, in the Christmas of 1837; in revising it, I have availed myself of the assistance of Mr. Parker, and the recent volume of Sir H. de la Beche.* The map illustrating this chapter is, to the north of a line drawn horizontally through Dawlish, a republication of one printed in 1837; below this line, I am indebted, for the boundaries of the strata, to the Ordnance map, subsequently published. On comparing these maps it will be seen, that they are generally in accordance; two masses of green sand, however, marked in the latter as crowning the Woodbury hills, are omitted, as I have not been able to find any traces of it in these localities.

The Tables of the Statistics of Life and Disease, have been made with considerable care, and at great expense of labour; in order to test the correctness of the former, the parish registers were investigated three several times, and the aggregate numbers so checked as to prevent the possibility of error; they are therefore well worthy of being compared and contrasted, in any enquiry into the probabilities of life in this country, with those of Northampton and Carlisle.

* Report on the Geology of Cornwall, Devon, and West Somerset.

The Barnfield, Exeter;
June 1, 1842.

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PART I.

THE CLIMATE, DISEASES, AND PRINCIPAL TOWNS OF THE SOUTH OF DEVON.

CHAPTER I.

CLIMATE OF THE SOUTH OF DEVON.

DEVONSHIRE has long been celebrated for the mildness of its seasons, and on this account has been a favorite resort of the invalid, and generally attractive as a residence; we are therefore not surprised that Sir James Clark should view it as extraordinary, "notwithstanding the public attention has been so long directed towards the climate of Devonshire, how few are the materials which can be collected with a reference to this subject."* I trust, however, the following pages will show that, as regards the South of Devon, observations sufficient have been made; and that the endeavour to deduce from them the peculiarities of its climate has not been unsuccessful.

* Clark on Climate, p. 138; 1841.

The circumstances which exert an influence on, and may be said to determine, the climate of a district, are by some meteorologists very much restricted; and Leslie, whom we must regard as a great authority, affirms that they are reducible to two,—distance from the equator, and height above the level of the sea. There can be no doubt, however, that the operation of the relative masses of water and land, of the geological character and cultivation of the soil, of the aspect of the sloping side, and more especially of the prevalence of the different winds, should be regarded; for most assuredly each of these tends, in some respects, not only to modify a local climate, but to constitute circumstances materially influencing the public health.

The more striking characteristic of the climate of Devon generally, is that of being warm and moist: though this is partly owing to its latitude, yet much is due to its position as regards the ocean, forming, as it does, a portion of a large promontory, or imperfect peninsula, projecting westward into the Atlantic, so that nearly one half of its circumference is sea coast. In this latter circumstance alone conditions exist, which not only ameliorate and soften its general character, but likewise tend to produce an equability of temperature, which is not common to larger breadths of land.

In the following pages it is proposed to illustrate

more particularly the climate and general medical character of that southern portion of the county, which includes Exeter, and the severally well-known watering-places in its vicinity. It would be inconvenient, as well as unnecessary, either to extend or limit our observations by any very arbitrary or artificial boundary. Moreover, the subject will be more usefully entertained, by referring to such places and circumstances as are of prominent interest in their relations to health, and the sojournment in disease.

The general physiognomy of the portion of the county now to be considered may be stated as being that of a succession of undulating high grounds, with luxuriant vales, and small fertile valleys, for the most part in a state of high cultivation, and richly wooded by very lofty hedge-rows;—these, which are thickly studded with elm and oak trees, (the former especially in the vale of the Exe,) form boundaries of, generally speaking, very small inclosures. Besides the undulating high grounds there are hills and ridges of very considerable altitude, as Dartmoor, Haldon, Woodbury, and Whitstone.

Though we have not space to dwell upon the scenery of the district, it may not be inapposite to mention that at almost every step those varying scenes of rich home views and extended prospects present themselves, which have greatly contributed to obtain for Devonshire the name of one of the most beautiful counties in the kingdom.

We shall now proceed to state the climate of this portion of the South of Devon, as deduced from actual observation.

TEMPERATURE. The mean annual temperature is 51° 29′;* this is nearly one degree higher than that of London. There can, however, be no doubt that the mean for London is very considerably overstated when calculated to be as high as 50° 39′. Luke Howard, and he is confirmed by Daniell, states the mean for the latitude and level of London not to amount to more than 48° 5′. In stating it to be 50° 39′, I follow Sir James Clark, who has taken as his standard the results derived from registers kept

* According to the formula of Leslie, the mean temperature of this district at the level of the sea is 53°, with an almost extreme variation of 90°. The line of perpetual snow being 6167 feet above the level of the sea. So that its observed mean temperature of 51° 29′ is 5° 51′ below the mean of the whole earth, and 1° 31′ below the estimated climate for Exeter, which is 52° 60′, as a deduction for altitude must be made of about 1 degree for every 100 yards.

In the table of Ptolemy, which is generally esteemed to be very accurate, this district is in the eighteenth climate or parallel, with 16^{h} 15′ for the length of its midsummer day, and 1° 36′ for the breadth of its zone. Humboldt, however, laying aside every theoretical consideration, has endeavoured to arrange the places on the earth's surface under what he terms isothermal lines; these lines being determined by the mean temperature of the places themselves. According to this system, he fixes this portion of Devon, erroneously certainly, on the northern side of that line, the like temperature of which is stated to be 50°, and within that zone, whose annual mean ranges from 41° to 50°, the extreme range during the year being estimated at 32° 5′. This system is here particularly mentioned, as it will greatly facilitate comparison with such districts as may be deemed desirable.

in the heart of the metropolis itself, where the climate is necessarily much influenced by the local circumstances of a great city.

In comparing the thermometrical observations of this portion of Devonshire with those made in other parts of England, we observe that equability of temperature is one of its striking characteristics. The difference between the warmest and coldest of ten years* amounting but to four degrees, and the mean difference of temperature in succeeding years, but to one degree and a half. This same relative superiority of equable temperature obtains, likewise, in the various months and seasons of each year: this fact is made sufficiently obvious by comparing the thermometrical observations recorded in this district, with those made in

* *Mean temperature for ten successive years.*

	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
Exeter....	53·06	53·74	51·92	52·59	48·73	49·80	51·62	49·76	50·11	51·57

Difference of temperature in succeeding years.

	1825 and 1826	1826 and 1827	1827 and 1828	1828 and 1829	1829 and 1830	1830 and 1831	1831 and 1832	1832 and 1833	1833 and 1834
Exeter....	·68	1·82	·67	3·86	1·07	1·82	1·86	·35	1·46

Mean temperature of those years above the mean of the climate	52·41
,, ,, below ,, ,,	49·60
Difference.....	2·11

London.* Nevertheless, though not so commonly as in most other places, it is subject to alterna-

* *Mean temperature of the months.*

	Jan.	Feb	Mar.	Apr.	May.	Jun.	July.	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter....	39·06	41·73	44·47	48·73	55·34	60·33	63·64	62·27	56·97	53·29	45·58	43·43
London ..	37·3	40·4	42·6	48·0	55·6	60·0	63·4	63·5	58·8	51·7	43·4	39·5

Difference in mean temperature of succeeding months.

	Jan. and Feb.	Feb. and Mar.	Mar. and April	April and May	May and June	June and July	July and Aug.	Aug. and Sept.	Sept. and Oct.	Oct. and Nov.	Nov. and Dec.	Dec. and Jan.
Exeter....	2·66	2·73	4·26	6·61	4·99	3·30	1·37	5·30	3·68	7·70	2·14	4·36
London ..	3·3	2·2	5·3	7·6	4·3	3·4	0·1	4·7	7·	8·3	3·8	2·2

The mean difference of temperature in succeeding months.

Exeter ..... 4·09

London ..... 4·3

Difference of mean temperature between warmest and coldest months.

Exeter..... 24·57

London ... . 26·2

SEASONS.

Mean temperature of the seasons.

	Winter.	Spring.	Summer.	Autumn.
Exeter	41·80	49·51	62·08	51·94
London	39·1	48·7	62·3	51·3

Difference in mean temperature of successive seasons.

	Winter. and Spring.	Spring and Summer.	Summer and Autumn.	Autumn. and Winter.
Exeter	7·71	12·57	10·14	10·14
London	9·6	13·5	11·	12·2

Difference of mean temperature between winter and summer.

Exeter ..... 20·28

London ..... 23·2

tions of temperature, which are occasionally very considerable, so that much greater differences take place than might be expected in the means of succeeding years, and of the corresponding seasons of these years. For instance, the difference of the means between 1827 and 1828 amounted to nearly three degrees and a half (3° 36′), while between the winters of 1826-7 and 1827-8 a difference in the mean temperature took place, which amounted to more than four degrees and a half (4° 60′), very nearly as much as the total difference in the mean temperature between the warmest and the coldest of ten successive years.

Temperature.

Dec. 1826	46·00	Dec. 1827	47·30	Difference.	1·30
Jan. 1827...	39·48	Jan. 1828...	43·69	,,	4·21
Feb. 1827...	35·60	Feb. 1828...	43·91	,,	8·31
Mean...	40·36	Mean...	44·96	,,	4·60

In further confirmation of these great occasional variations we may observe, in the above table, that the corresponding months of February in these two succeeding years differed to the very great extent of nearly eight degrees and a third.

These occasional variations of climate are especially worthy of notice, and every means should be taken to make them obvious; they are the cause of much acute and fatal disease, which, there can be no

doubt, might be in some measure avoided, were only due caution observed. All classes indiscriminately are lulled by the mildness of several successive winters into undue exposure, and carelessness of clothing, and the poor, more especially, into a general improvidence against the effects and consequent distress of severe weather, so that, whenever the temperature suddenly falls or maintains itself for any length of time considerably below the general average, a more than ordinary proportion of privation and mortality is the consequence.

The changes which take place between the temperature of the different months and seasons of the year* are likewise worthy of remark. January,

* *Mean of the maximum daily temperature for each month.*

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter ...	51·2	55·2	58·6	65·4	72·8	77·7	81·5	77·6	71·1	65·4	59·6	56·3
London ...	40·28	44·63	48·0	55·3	64·	68·3	71·5	71·2	65·6	57·0	47·2	42·6

Mean of minimum daily temperature for each month.

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Exeter ...	25·1	26·8	29·9	32·5	38·4	45·5	48·1	46·6	42·1	36·2	28·7	31·0
London ..	31·2	33·7	35·3	39·4	46·5	49·7	53·8	53·9	48·6	43·5	36·4	33·9

Difference between the mean maximum and mean minimum temperature for each month.

	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter....	26·1	28·3	28·7	32·9	34·4	32·2	33·4	31·0	29·0	29·2	30·9	25·6
London ...	8·9	10·9	12·7	15·9	17·5	18·6	17·6	17·2	16·9	13·5	10·7	8·7

whose average temperature is thirty-nine degrees, is the coldest month in the year. The temperature progressively increases until July, when it attains rather more than a mean height of sixty-three degrees and a half (63·64) from this it gra-

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Mean difference between the temperature of day and night.

Exeter	30·
London	14·14

Difference between the mean temperature of day and night at each season.

	Winter.	Spring.	Summer.	Autumn.
Exeter	26·6	31·3	32·	29·
London	9·5	18·7	17·9	13·8

Variation of temperature of successive days for the whole year.

	Mean variation.	Extreme variation.
Exeter	3·3	27
London	4·0	18

Mean range of the thermometer.

	Annual.	Monthly.	Daily.
Exeter	59·0	29·9	6·7
London	64·0	34·	11·0

Absolute range.

	Greatest.	Lowest.	Mean.
Exeter	94	16	70
London	96	5	91

dually decreases through the remaining months till the minimum of January is again attained. The increase is very gradual during the months of January, February, March, and April, between April and May it is very considerable, amounting in fact to more than six degrees and a half (6·61), more than half of the whole difference that takes place between spring and summer. The decrement is only great between August and September, and October and November. In London the great falls in temperature take place during September, October and November, and the mean maximum temperature is not attained till August.

In the seasons the greatest change of temperature takes place between the spring and summer, amounting to more than twelve degrees and a half (12·57); the least variation is between winter and spring, being rather less than eight degrees (7·71). Though these changes may at first sight appear considerable, yet when contrasted with those of London, and other places in England, the equability of climate is very marked; for notwithstanding the mean temperature of this district is higher than that of London, yet its summer is less hot, while its winter is considerably less cold.

That the climate here is generally more equable, and the winters much milder than in most places of a like mean temperature, is rendered sufficiently obvious if we look to such as are within the same

zone of temperature; (*vide Note* *, p. 4:) in common with London, their winters are, generally speaking, colder, and their summers warmer. This fact may be further illustrated by selecting those places, the winter temperature of which is the same as that of this district, and regarding how very much their annual mean temperature is in excess of that of Devon. Amongst the first class are Vienna, with a winter whose average temperature is colder by more than nine degrees and a half, and a summer warmer by more than seven degrees; and Manheim, with a winter three degrees colder, and a summer five degrees hotter; Clermont and Brussels, together with other places, too many to mention, and which have a mean temperature scarcely superior to that of Exeter, are visited by far greater coldness in winter, and a heat much more considerable in summer. All these places are, therefore, obviously subject to much greater variations of temperature than this portion of Devonshire, thus, while the difference between the mean summer and winter temperatures of the latter does not amount to much more than twenty degrees (20·28), that of Clermont is nearly thirty degrees (29·88), and that of Brussels but very little less (29·52).

Further, if this district be compared with many places whose winter temperature is about the same, or in other words were an isochimal line, after the system of Humboldt, to be drawn from the South of

Devon, we should have presented to our notice such places as Nantz, with a mean annual temperature higher by nearly three degrees and a half (54·68); Bordeaux, by more than five degrees (56·48); St. Malo, by nearly three degrees (54·14); Pau, by more than three and a half (54 95), &c. No stronger proof need be offered than these facts afford of the comparative equability of this climate, and as regards the British Isles, I very much question whether there be any portion, with the exception of the Land's End, which can vie with it in this respect.

On comparing the differences of temperature between day and night in this district with the corresponding diurnal differences in London, as given by Luke Howard, a dissimilarity is observed as remarkable as it was unlooked for; while the mean difference of temperature between day and night, for the whole year, amounts here to thirty degrees; in London it is stated not to exceed fourteen degrees and a half (14·14). This discrepancy obtains, likewise, in the mean diurnal variation which takes place during the several months and seasons. But what makes it still more remarkable, is the fact that, while this very much slighter diurnal variation exists in the metropolis the monthly mean range of temperature, as well as the absolute range, is rather greater. One is immediately induced to suspect that some reason for this very great dissimi-

larity in the climates of London and Devon may be found in the fact of the cooling of the air of the former being interfered with by artificial and local causes. Yet what is to be said when this accurate observer states, that nearly a like condition exists in that which he is pleased to call the climate of the district of London, *i. e.* a climate calculated from registers kept a few miles from the metropolis itself? I was at first willing to believe that some error existed in the mode of calculating these differences; such, however, has not been found on re-examination to be the case Are we then to conclude that the temperature of day and night in this district is much less equable than in London and its neighbourhood? or, supposing this to be the case, how are we to reconcile the curious discrepancy between the proportionate smallness of the daily range of temperature in London, and the largeness of its monthly mean and absolute range? That these anomalous conditions of temperature really do exist is evident, as shown by actual observation, and I cannot help concluding, notwithstanding the seeming objection of Luke Howard, that an explanation must be sought, not only in the great quantity of heat artificially generated there, but also in the dense masses of houses radiating during the night the excess of temperature acquired during the day; the surrounding thick atmosphere constituting a medium which prevents this taking place as rapidly as if the sky

were clear, and assisted by a free ventilation. The same causes may be adduced to explain why the maximum temperature is arrived at a month later than in this less obstructed district.

Before leaving the subject of temperature, one or two remarkable circumstances may be alluded to. In 1825, on the 19th of July, the wind blowing from the eastward, and the barometer standing at 30·10, the temperature arose to the unusual height, in the shade, of 95°, and 132° in the sun. In 1835, on the 17th of August, the wind blowing from the east, the barometer standing at 30·20, the temperature was 82°; three days after this the wind being from the south-east, the barometer having slightly fallen (29·90), the temperature rose to 86°. In 1828, on the 28th of January, the wind blowing from the west-south-west, the barometer 29·98, the temperature was as high as 56°. So mild and genial was the atmosphere, that the birds were singing as if it were spring, and boys were literally bathing in the river; almost similar mildness characterized the latter end of December, 1833,* and the beginning of January of 1834.† In 1829, on the 25th of January, the wind from the north-east, the barometer at 29·41, the temperature was as low as 12°, a very unusual occurrence in this district. On the 1st of January of the following year the thermo-

* 1833, Dec. 30th, therm. 53, barom. 29·90, W.

† 1834, Jan. 2d, therm. 45, barom. 30·34. N.W.

meter marked a temperature nearly as low (14°); the wind blowing also from the north-east, and the barometer standing as high as 30·56.

As somewhat connected with the subject of temperature, we may here note the relative quantities of cloud and sunshine* which are proper to this district. For the most part the skies are disposed to be clouded and overcast; the months in which this is peculiarly the case, are January, December, November, February, March, and October; they are placed in this order to indicate the relative proportion of shade proper to each month. The brightest and most sunshiny months are April and May, July and August have only a moderate proportion. It is in great measure owing to the peculiar prevalence of cloud, that grapes, and other out-door fruits of high flavour, so frequently fail in arriving at a desirable state of maturity. As far as mere temperature is concerned, there is no reason whatever for their not

* *Daily average for the year.*

Sunshine.	Gleam.	Cloud.
115·2	78·1	170·6

Daily average for each month in the year.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Sunshine..	7·1	6·6	9·5	12·1	12·5	10·5	11·	10·6	11·5	9·6	6·5	7·6
Gleam....	3·6	4·4	4·8	7·7	9·	8·1	8·6	10.1	8·1	6·	5·5	4·2
Cloud	20·2	17·2	16·6	10·1	9·5	11·2	11·3	10·2	11·3	15·3	18·	19·1

ripening sufficiently, but the absence of the direct rays of the sun prevents the perfect development of flavour. Though the south of Devon labours under this disadvantage, yet it meets with an ample compensation in its fields being usually unparched, and its springs flowing, during periods when the contrary is the case in other parts of England.

INDICATIONS OF THE BAROMETER. The indications of the barometer, though not very dissimilar from those of London,* yet show in all their indications a slighter amount of higher measurement, together with a tendency to less variation, excepting during the months of April and July; we

	Exeter.	London.
* The mean height	29·87	29·61
Mean of the maximum heights.....	30·34	30·26
,, minimum heights	29·35	29·17
Absolute maximum heights	30·90	30·62
,, minimum heights	28·80	28·22

Mean height of different years.

	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
Exeter	30·5	29·86	29·80	29·97	29·75	29·68	29·77	29·85	29·72	29·85

Mean variation in different years.

	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
Exeter	1·80	1·33	1·60	1·85	1·50	1·76	1·55	1·30	1·65	1·56

may therefore conclude that the atmosphere in this district is both less dense, and less liable to changes in its density, than is the case in the metropolis.

In considering the barometrical observations, without reference to other atmospherical phenomena, nothing very peculiar presents itself, with the exception of its range being greater in winter than in summer, and that during the former period it is at its minimum, and at its maximum in the latter. We may therefore infer that when the barometer indicates a dense state of the atmosphere, it

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Mean height in different months.

	Jan	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter ..	29·85	29·91	29·98	29·83	29·87	29·95	29·91	29·92	29·87	29·94	29·86	29·79

Mean range in different months.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Exeter ..	1·20	1·08	1·11	1·11	0·78	0·66	0·73	0·88	1·01	·98	1·11	1·15
London ..	1·42	1·35	1·29	1·07	0·91	0·83	0·69	0·75	0·89	1·15	1·45	1·45

	Exeter.		London.
Extreme range	2·10	.....	2·40
Mean and annual range	1·59	.....	1·95
Mean monthly range	·98	.....	1·07
Mean range in winter	1·14	.....	1·40
,, spring.....	1·00	.....	1·09
,, summer	·75	... ..	·75
,, autumn	1·03	....	1·16

acquires a less liability to variation than when the contrary condition obtains.

If we pursue our observations further, we find that all the great elevations of the column which mark the presence of a dense atmosphere, are attended not only by dry and probably continued fine weather, but appear in connexion with northerly winds, while all its great depressions being caused by a less dense state of the atmosphere, occur in connexion with southerly winds; we may instance, in illustration of this, the following remarkable and most opposite states of the barometer, that occurred during the ten years in which these meteorological observations were recorded. On the 10th of January, 1825, the barometer stood at 30·85, the wind blowing from the north; on the 23d of November, 1824, it stood at 28·09, the wind blowing from the south-west. The barometer, therefore, indicates not only the state of the weather, but also the great changes of the wind, for we find that the northern atmosphere, from the coldness of its temperature, necessarily contains but little aqueous vapour, and consequently becomes more dense, from the weight of the atmosphere being greater than that of aqueous vapour; as the northerly air advances towards the south it becomes warmed, and acquiring a greater capacity for vapour, dries up the atmosphere it invades; hence the connexion between the higher indications of the barometer, with

the northerly winds, as with the fine settled state of the weather. Exactly the reverse of this is the case when the atmosphere proceeds from the south; its temperature is less dense, and contains a larger quantity of vapour. On invading this climate it becomes cooled, by being mingled with its colder currents, by which means its density is increased, and consequently its capacity for vapour diminished, which is then deposited in the form of mist or rain.

HYGROMETRICAL CONSTITUTION OF THE ATMOSPHERE. The consideration of this subject is very important, much more so than one might be led to expect from the general looseness, or almost total neglect with which observations upon it have been made. The effects which very slight variations in moisture exert upon some forms of disease sufficiently show how powerfully it acts upon the human economy.

The moisture of the climate of this part of England is proverbial, and the observations which have been made by Daniell's hygrometer fully sustain for it this character.

Though the absolute state of the dew point by itself may be interesting, yet the only way of appreciating the true condition of atmospheric moisture, is by noting the difference between the temperature of the atmosphere and the temperature at which dew is deposited; for when the temperature of the

dew point approaches that of the atmosphere, a moist climate is present, and, when they are widely separated, a dry climate prevails.

From a daily observation made at 9 A.M., * for the space of five years, the mean temperature at which dew is deposited is about forty-six (45·9), while the temperature of the atmosphere itself is fifty-three, so that there is only a mean difference of four degrees and a half (4·4) between them. This

* *Mean dew point for the several months during five years, with corresponding thermometrical observations.*

	1832		1833		1834		1835		1836		Mean D.P.	Mean Ther.	Diff.
	D.P.	Ther.	D.P.	Ther.	D.P.	Ther.	D.P.	Ther.	D.P.	Ther.			
January	36·8	39·3	33·7	36·	44·3	45·	37·9	39·	38·	40·3	38·1	38·9	1·8
February	36·	39·7	40·2	43·7	39·3	40·2	40·2	43·	36·2	39·2	38·3	41·1	2·8
March..	38·2	44·4	34·5	38·1	45·3	45·7	39·8	44·2	39·7	44·3	39·5	43·0	4·4
April ..	41·	51·8	41·	47·8	48·3	48·3	43·4	48·3	40·	46·9	42·7	48·6	5·9
May ...	47·6	55·4	49·4	53·6	55·2	57·1	47·7	55·2	43·9	53·7	48·7	56·	7·3
June ..	49·4	61·4	51·2	56·7	57·1	60·4	53·4	61·1	53·	60·3	52·8	59·9	7·1
July....	52·5	66·4	53·4	62·5	59·	63·5	56·1	65·1	54·6	62·9	55·1	64·0	8·9
August .	52·7	62·8	51·6	60·1	57·9	62·4	56·6	63·9	53·4	61·3	54·4	62·1	7·7
Septem.	50·5	53·7	51·3	55·2	53·8	59·1	53·1	57·9	48·7	55·4	51·4	56·2	4·8
October .	47·8	50·5	48·7	51·7	48·1	52·6	46·1	48·6	45·	47·8	47·1	50·2	3·1
Novem.	43·3	45·2	44·3	42·	40·1	42·8	44·1	45·1	39·5	43·2	42·2	43·6	1·4
Decem.	40·2	42·9	44·9	46·8	39·4	42·	45·	46·	37·2	40·9	41·3	43·7	2·3
Mean ..	44·6	51·	45·2	49·9	48·9	51·6	46·9	51·4	44·1	49·8	45·9	50·7	4·4

Mean dew point for each season, with corresponding thermometrical observations.

	Winter.	Spring.	Summer.	Autumn.
D.P.	39·2	43·6	54·1	46·9
Ther.	41·5	49·5	62·	50·0
Difference ..	2·3	5·9	7·9	3·1

slight variation indicates an atmosphere charged with fluid, and the slightest depression in its temperature immediately involves the deposit of moisture, either in the form of dew or rain.

The winter season is the most damp, the differences of temperature amounting to but two degrees and a third (2·3), nor is the autumn much superior in this respect, the difference being very little more than three degrees (3·1). The summer and spring are comparatively dry seasons, the mean difference in the temperature of the dew point, and the atmosphere in the former, amounts to nearly eight degrees (7·9), and in the latter to nearly six (5·9).

As regards the months, the dampest is November, when a difference not amounting to one degree and a half (1·4) exists; December is dryer by one degree. The tendency to moisture increases again in January; from this time until July, the atmosphere gradually becomes dryer, until the mean difference of nearly nine degrees (8·9) is attained; it then becomes gradually moister, until the extreme dampness of November is again arrived at. In general language it may be stated, that from March to September the climate is dry, and during the remainder of the year humid.

The dew point alone cannot be taken as a very certain index of the probability of rain; for although the mean maximum temperature at which dew is

deposited, is only two degrees and a half* below the corresponding temperature of the atmosphere, while there is a difference of more than seven degrees and a half when the mean minimum takes place, and although the maximum dew point is accompanied by south and south-west winds, and misty or showery weather, and the minimum, by north and north-east winds, and fine weather; yet it would appear that no very intimate connexion exists between it, and the weight of the atmosphere; for notwithstanding the atmosphere is generally more dense with a low dew point, than with a high one, yet the variation amounts only to a little more than one tenth of an inch, while the corresponding mean range of the dew point amounts to nearly sixteen and a half (16·4).

Rain. The western shores of England are necessarily, from their aspect and position as regards

* *The mean maximum dew point, with corresponding observations.*

	Dew point.	Barometer.	Thermometer.	Winds.	Weather.
Exeter	53·6	29·75	56·1	S. and S. W.	Misty and Showers

The mean minimum dew point, with corresponding observations.

	Dew point.	Barometer.	Thermometer.	Winds.	Weather.
Exeter..	37·2	29·84	44·8	N. and N.E.	Fine.

the Atlantic, subject to a large share of rain. Common report has ever extended this charge especially to Devonshire; nevertheless, direct observation proves that, whatever may be the case as regards other parts of the county, this southern portion is by no means so particularly liable to it.

The mean annual fall of rain* amounts very nearly to thirty-two inches (31·90), being about seven inches more than fall in London. As might be expected, the quantity that falls in different

* *Mean annual fall in inches.*

St. Thomas	31·9
London	25·

Mean quantity of rain in each year, for ten years.

	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
St. Thomas ..	28·72	30·53	33·23	40·31	34·9	32·71	34·88	30·21	35·25	26·65

Mean fall of rain in each month.

	Jan.	Feb.	Mar.	April	May.	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
St. Thomas	2·9	2·6	2·1	2·5	1·9	2·5	2·2	2·4	3·0	3·1	3·1	3·6
London ...	1·9	1·4	3·2	1·6	1·8	1·9	2·6	2·1	1·9	2·5	2·9	2·4

Mean fall of rain in different seasons.

	Winter.	Spring.	Summer.	Autumn.
St. Thomas	9·1	6·5	7·1	9·2
London	5·8	4·8	6·6	7·4

years is very various; thus, in the ten successive years, during which these observations were made, there fell in one year (1828), the very enormous quantity of more than forty inches (40·31), while in another (1834), it did not exceed much more than twenty-six inches and a half (26·65), so that the difference between these several years amounted to nearly fourteen inches (13·86).

The number of years in which a quantity of rain falls above the average, is greater than that in which it is below, in the proportion of six to four; while in London it amounts to but fourteen to ten, eleven intermediate years being stated to be in neither extreme.

During the autumn and winter seasons the largest quantity of rain falls; in the summer the fall is proportionably moderate, and least in the spring. In London the smallest quantity of rain falls during the winter and spring, and the largest quantity during the summer and autumn, so that the chief difference between the two districts is, that in Devonshire the winter is rainy, which is not the case in London.

With regard to the average quantity of rain that falls in each month, we find that by far the larger proportion is deposited in September, October, November, and December; while from March to August the fall is comparatively small. This also differs slightly from what takes place in the metro-

polis, where but little rain falls in September, and where May, in which the least quantity of rain falls here, is relatively a rainy month. In July the absolute amount of rain that falls in London is greater than in this part of Devonshire.

Though the quantity of rain which falls annually here is greater than in London, yet the number of wet days is not so many: by a wet day is understood a day on which a fall of rain, however slight, takes place. Here the average annual number of wet days amounts to rather more than a hundred and sixty-two (162·4),* while in London it amounts to one hundred and seventy-eight. In a previous page the autumn has been stated to be the most rainy season, *i.e.* the season in which the largest amount of rain falls, but during the winter the greater number of

* *Average number of wet days in a year.*

St. Thomas	162·4
London.....	178·

Number of days on which rain falls in each season.

	Winter	Spring	Summer	Autumn
St. Thomas	42·0	36·8	41·7	41·9
London	48·	43·	44·	43·

Number of days on which rain falls in each month.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
St. Thomas	12·9	11·8	12·3	12·2	12·3	13·6	13·1	15·	13·4	14·	14·5	17·3
London ..	14·	16·	13·	14·	16·	12·	16·	16·	12·	16·	15·	18·

wet days are registered, for the autumnal rains are heavy, while those of winter partake more of the character of continual drizzle; we therefore see that, in this district, as well as in other places, the extent of wet weather is by no means to be measured by the amount of rain registered. This may be rendered more obvious by comparing the observations of the number of rainy days in the several months, with the quantity of rain; for instance, February, which has fewer wet days here than any of the other months, has yet a larger share of rain, while in London directly the reverse is the case, the average of rain being low, and the proportion of wet days large:—in this part of Devonshire there are on an average rather more than thirteen (13·5) rainy days in this month, while in London there are very nearly fifteen (14·8), June and September have more wet days here than in London, while February, March, April, and May have few here, and a large number in London. It is therefore evident that more rain falls in this district in a given time than in London.

The statement that it is chiefly continued rain which falls during the winter, while in the autumn the rain is deposited for the most part in showers, is fully borne out by the result of eight years' observations,* made on the characters of the dry and rainy

* All sunshine constitutes a fine day; alternate cloud and sunshine, without rain, a fair day; and alternate cloud and sunshine, with rain,

days, from the year 1829 to 1836 inclusive: for these I am indebted to Dr. Barham.

FROST, SNOW, AND SLEET. Frost, during the winter and spring seasons, is by no means unfrequent, but very rarely indeed does the atmosphere maintain, for any length of time, a temperature below the freezing point: this is to be expected from the mean temperature of these periods being considerably above that point.* About once in five years, however, we have a severer winter, and a continuous

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a showery day. The fine, fair, and cloudy days, are dry days; the showery and wet, are wet days.

Average character of the days for each year and season.

	Fine	Fair	Cloudy	Showery	Wet
Annual average..	135·5	51·12	30·6	63·	76·9
Winter	22·0	14·2	15·5	12·4	25·2
Spring	40·3	12·5	6·1	18·1	14·8
Summer	44·1	10·6	1·8	20·5	14·6
Autumn	26·0	13·7	8·2	18·8	23·

Average general character of the days for each month.

	Fine	Fair	Cloudy	Showery	Wet
January.....	6·1	4·6	7·5	3·9	8·8
February	8·	4·5	3·1	4·5	8·1
March	9·2	5·9	3·6	6·	6·2
April.....	12·9	2·6	1·	7·5	6·
May	18·2	4·	1·5	4·6	2·6
June	13·	3·5	0·8	6·7	5·9
July	15·9	3·6	0·7	7·1	3·6
August	15·2	3·5	0·3	6·7	5·1
September.....	11·3	4·1	0·6	8·5	5·3
October.....	8·1	5·6	2·7	5·7	7·7
November.....	6·6	4·	4·9	4·6	10·
December	7·9	5·1	4·9	4·	9·

* Vide Note* p. 6.

frost of ten days or so is marked by the freezing of the rivers, &c.

Snow but rarely falls in any great quantity, or remains upon the ground above two or three days, except on the high lands, which sometimes are covered for a considerable time by a light snow. In ten years the number of days in which snow or sleet fell amounted to only sixty-nine.* During a fall the wind is generally from the north-east, the barometer not standing very low (29·76), and the thermometer indicating a temperature not quite a degree below the freezing point; the fall nearly always takes place in January and February.

HAIL† occurs only a little more frequently than

*Yearly average	Barom.	Therm.	N. E.	E. S.	S. W.	W. N.
6·9	29·76	31·8	3·1	1·7	·5	1·9

These sixty-nine days of snow and sleet were thus distributed:—

	Jan.	Feb.	March	April	May	Oct.	Nov.	Dec.
Sixty-nine days' snow	30	15	5	6	1	1	5	6

	Yearly Average	Barom.	Therm.	N. E.	E. S.	S. W.	W. N.
† Hail..	7·1	29·59	34·2	·5	·3	1·7	4·6

These seventy-one days of hail were thus distributed:—

	Jan.	Feb.	Mar.	Apr.	May.	June	Sept.	Oct.	Nov.	Dec.
Seventy-one days' hail	9	9	7	16	3	1	2	4	5	15

snow. In ten years the number of days in which it fell amounted to seventy-one. It is most prevalent in April and December. During a hail storm the barometer is rather lower than when snow falls, with a slightly higher temperature (34·2). These storms usually proceed from the north-west. It is worthy of remark, that there is almost constantly a change of wind during a hail-storm; before the fall of hail the wind is generally from the south-east, and immediately succeeding it from the south-west, and north-west; the former (relatively) is a cold wind,* while the two latter are warm; it therefore becomes evident that the fall of hail is due to a warm current of air being suddenly chilled by coming in contact with a colder current, by which means its capacity for moisture is decreased, and the result is the deposit of the superabundance in the form of hail.

THUNDER AND LIGHTNING are comparatively unfrequent, and very rarely, indeed, are the storms attended by serious or awful consequences. In ten years the number of days in which storms of thunder and lightning occurred, amounted to 105,†

* S. E. average temperature ..... 50·85
S. W. ,, ... 53·49
N. W. ,, ... 51·75 vide postea.

	Yearly Average	Barom.	Therm.	N. E.	E. S.	S. W.	W. N.
†Thunder and Lightning	10·5	29·69	57·1	·7	4·2	3·8	1·8

† These one hundred and five days are thus distributed:—

taking place for the most part during the summer months; nevertheless their greater prevalence then does not appear altogether to be owing to the higher temperature of this season; for more storms take place during the cold month of December than in the months immediately preceding and succeeding it. The barometer, during a thunder storm, stands rather lower than its usual average; the thermometer marks a high temperature, about six degrees above the mean of the climate, and the wind is usually from the south-east or south-west.

Though these storms, as we have said, are rarely attended by alarming consequences, yet occasionally serious results take place. The most awful visitationof recent years occurred on the 10th of June, 1826, when a thunder storm vented its fury at Alphington; the tower of the church was struck by the electric fluid, and a boy, then at work upon it, killed on the spot.

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
One hundred and five days	4	2	4	5	13	16	15	16	10	7	3	10

The average number of days for each season is 2·5, occurring in the following proportion :—

	Winter	Spring	Summer	Autumn
Thunder and Lightning	1·6	2·2	4·7	2·

WIND. The greatly-prevailing winds * of this district are the west and north-west; they are much

* *Average frequency of each wind in a year.*

N.	S.	E.	W.	N. E.	N. W.	S. E.	S. W
32·8	41·4	29·7	73·7	42·8	57·6	41·4	44·8

Relative frequency of the winds in each month during the space of ten years, i. e. from 1825 *to* 1834.

	N.	E.	S.	W.	N. E.	N. W.	S. E.	S. W.
January	3·8	2·4	3·9	3·8	6·1	5·3	2·8	2·8
February	2·2	2·3	1·5	6·9	3·1	4·5	3·6	4·3
March	2·3	1·7	4·0	6·5	4·5	5·6	3·7	2·6
April	4·1	2·9	2·9	5·6	3·4	4·6	4·0	2·3
May	2·1	4·4	3·0	3·7	5·0	4·7	5·5	2·6
June	1·9	3·0	1·4	7·4	2·3	5·0	3·7	4·3
July	2·0	4·1	1·6	4·2	3·6	5·2	4·4	3·5
August	2·5	3·9	·8	6·4	3·5	4·6	2·4	4·7
September ..	1·9	3·7	3·0	6·5	2·6	4·0	2·9	5·2
October	3·4	5·6	2·4	7·0	1·2	3·5	3·2	5·5
November ..	3·5	2·6	2·2	7·6	3·4	4·8	2·7	3·2
December....	2·8	3·7	2·1	7·0	4·0	4·4	2·7	4·5

Prevailing wind for each month.

Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
N. E.	W.	W.	W.	S. E.	W.	N.W.	W.	W.	W.	W.	W.

In the above table the eight leading divisions of the compass are adhered to. Luke Howard, however, prefers including all the winds in four divisions; and for the sake of comparing them with the winds of London I shall now do likewise.

Relative proportion of winds for ten years.

	N.W.—W.	S.W.—S.	S. E.—E.	N. E.—N.
Exeter, 1825-34..	131·3	86·2	71·1	75·6
London, 1807-16..	100·4	104·4	53·9	74·4

more frequent than in London: the south-west and south are more prevalent there than here. The easterly wind with its variations to the south and north occur very rarely both here and in London. The east and south-easterly winds prevail chiefly during May, July, and October; the west and north-westerly winds, in June, November,

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*Average temperature during the several winds.**

N.W.—W.	S.W.—S.	S. E.—E.	N. E.—N.
51·75	53·49	50·85	48·32

Averaged temperature during the several winds in each month, for seven years.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
N.W.—W.	43·3	43·8	47·0	48·5	56·0	59·0	60·9	61·2	56·1	52·2	47·1	45·9
S.W.—S.	46·3	47·4	47·3	51·7	55·6	60·0	63·7	61·1	58·1	52·4	50·1	48·2
S.E.—E.	37·6	37·0	44·1	49·5	56·4	59·5	66·2	64·1	60·0	52·4	44·5	39·0
N.E.—N.	35·3	36·7	40·5	46·7	51·3	61·3	63·8	61·0	55·5	50·0	41·5	36·3

Average temperature during the several winds in each season.

	N.W.—W.	S. W.—S.	S. E.—E.	N. E.—N.
Winter.....	44·3	47·3	40·2	36·1
Spring	47·1	51·5	50·	46·1
Summer	60·3	61·6	63·2	62·0
Autumn	51·8	53·5	52·3	48·0

Average height of the barometer during the different winds.

N.W.—W.	S.W.—S.	S.E.—E.	N.E.—N.
29·73	29·64	29·84	29·85

* These observations, which extend over a period of seven years, were only registered when the wind was permanent during the day.

February, December, and March; in fact no winds blow in any one month so constantly as these do in the month of June. South and south-westerly winds prevail most in September, and north and north-easterly winds in January.

We have previously remarked that the barometer is at its highest, and the dew point at its lowest, during the north and north-easterly winds, and the barometer at its lowest, and the dew-point at its highest, during the south and south-westerly winds: consequently, the dry winds are those ranging from the south backwards to the north, including the east and its variations, while those that are attended by rain or moisture blow from the south forwards to the north, including the west, and its variations. The greater prevalence of these latter winds sufficiently accounts for the large proportion of rain that falls. Taking the average of the whole year, the south and south-westerly winds are attended by the highest temperature; and the north and north-easterly by the lowest; this is not however maintained during every period of the year; in fact the temperature, not only of these, but of all the winds, varies absolutely, as well as relatively, during the several months. The east and south-easterly winds for instance are accompanied by a temperature higher than any other winds in May, but in February, by nearly the lowest; and the north and north-easterly winds, which we have just spoken of

as being, on the yearly average, the coldest, are during the month of June warmer even than the south and south-westerly. In fact they are the coldest of all the winds in winter, and the warmest in summer. It is evident, therefore, that the temperature of the different winds varies very considerably: the north and north-easterly winds exhibit an extreme mean variation of nearly twenty-nine degrees (28·8); the east and south-easterly winds of more than twenty-eight degrees and a half (28·6); the south and south-westerly of nearly twenty degrees (19·9); and the north and north-westerly of only about eighteen degrees (17·9). This relative alteration of temperature is easily understood when we regard the points from which the several winds proceed, and the tracts they pass over. The west and north-westerly, though blowing from the cold latitudes, yet from passing chiefly over ocean, are not only modified in temperature, but are rendered more equable than any of the other winds, while the north and north-easterly coming certainly from latitudes still colder, are not only the coldest, but, from passing over large masses of land, are subject to greater variations. This is also the case with the east and south-easterly winds, the difference in whose means is not much less, passing over as they do the vast deserts of Arabia. The south and south-westerly winds are also modified considerably, from passing over the Atlantic.

During the winter season the south-west wind is

often accompanied by a warm thick mist, which is peculiarly relaxing, and from its frequency not unaptly styled Devonshire weather. This wind, traversing the great mass over the Atlantic, from the warmer latitudes, reaches the coast overcharged with a greater quantity of moisture than the air can contain, when cooled by the lower temperature of the local climate; the result is the misty appearance of a great dew deposit. A similar phenomenon not unfrequently attends the south-east wind during the summer. The principle of its action is the same, that is to say, the wind comes parched and heated from the Arabian desert, saturates its capacity for moisture with the waters both of the Mediterranean and of the English Channel, and deposits it again upon our coast, thus refreshing the country with dew. Not so in winter; during this period we have shown it to be the coldest of the winds, when by mingling with and cooling the warmer air of our climate it causes the dew deposit.

The winds very rarely blow hard; in this district, generally speaking, the tendency of the air is to gentle and light breezes. Occasionally, however, it is visited by storms and gales. Those of peculiar violence since my residence here, have been a very violent storm of wind, from the west, on the 20th of February, 1833, when elm and other trees were torn up by the roots in all directions; it commenced at about six in the morning, and continued till noon;

another during the night of the 28th of March, which wrecked many vessels upon our western coast; and the hurricane of the 28th of November of the same year. At eight o'clock in the morning the sky became clouded, and some drizzling rain fell; about nine, a brisk wind arose from the south-west, (the barometer falling to 28·50,) which quickly increased to a force of frightful power: trees were torn up; houses unroofed; masses of lead were rolled from their places, like sheets of paper, and carried to the distance of many yards; slates and portions of building materials fell in all directions like hail: nothing could exceed the dreary character of the atmosphere during this period. Shortly after ten A.M. the hurricane subsided, the clouds were dissipated, the clear blue sky being only here and there traversed by long flowing tail-shaped clouds. The aspect which the sky now presented was serene and quiet; the air became warm and pleasant; and, but for the universal scene of devastation around, nothing indicated the convulsion that had so lately taken place.

This hurricane, according to the best calculations that I could make, passed over this district (during the period of its greatest violence) at the rate of eighty miles in the hour; assuming this to be correct, the pressure on each square foot amounted to the great force of 31·490 pounds.

Chapter II.

SUMMARY OF THE CLIMATE, AND THE DISEASES PROPER TO IT.

It may be seen from the previous sketch that the chief characteristic of the climate of this district is that of being warm, soft, mild, equable, calm, and free from storms; though subject to a large share of rain, yet it seldom occurs that a whole day is so unceasingly wet, as not to afford some hours, whether early or late, sufficiently fine for out-door exercise. During the winter season the temperature rarely maintains for any length of time a degree so low, as to render the climate particularly inclement; frost seldom occurring, and rarely of long continuance. The air is usually damp; but from the general prevalence of warm westerly winds, the moisture which it contains is not cold and chilling. A general impression prevails that this, which

may be styled the muggy weather of Devon, is unwholesome, such however is not the case, as will be seen in the sequel; in fact the accompanying temperature takes from it the usual injuriousness of such a condition. The character of the spring during the early part does not materially differ from the winter, excepting that the air is less damp, and the days less rainy. Towards the close of this season north-easterly winds somewhat prevail; these should be particularly guarded against, especially by the delicate, as from their piercing and cold nature, they are apt, by repressing the cutaneous functions, to cause internal inflammation. The summer is rarely very hot, and though showers are frequent, yet it may be considered a dry season. The winds which blow, for the most part from the north-west, are cooling and refreshing. The evenings and nights, however, are sometimes cold and damp, and, therefore, exposure at these times, with only summer clothing, should be avoided. The autumn is warm, and inclined to be damp and rainy; it is peculiarly the season for the Devonshire drizzle, which is a rain so light as to deposit itself as a thick dew, attended by a gray-clouded sky: the winds during this season are chiefly from the west. By way of marking the general mildness of the climate, it may be mentioned that many of the tender and delicate exotics flourish in the open air, and are not destroyed by exposure

during the winter season.* During this period also, it is not unfrequent to see the hedges studded with many of the native flowers.

We shall now proceed to illustrate the effects of this climate upon the constitutions of its inhabitants, by giving a description of the diseases incidental to the neighbourhood.†

* Erythrina laurifolia.
Eriobotrya Japonica.
Laurus camphora.
Camellia Japonica, in all its varieties.
Camellia reticulata.
Thea viridis.
—— bohea.
Magnolia fiscata, var., Exoniensis.
Arundo donax.
Agave Americana.
Passiflora Brasiliensis.
Linum trigynum.
Coronilla glauca.
Hydrangea hortensis.
Nerina undulata.
Buddlea globosa.
Gazania rigens.
Photinia serrulata.
Mimulus cardinalis.
Verbena Melindres.
Illicium Floridanum.
Myrtus communis.
Punica granatum.
Citrus medica.
——— limonum.
——— acida
——— aurantium.
Olea Europæa
Gladiolus cardinalis.
——— psittacinus.
Alstræmeria, varieties.
Ixia, varieties.
Metrosideros saligna.
Chrysanthemum Indicum.
Cheiranthus tristis.
Eucomis punctata.
Hemerocallis Japonica.
Salvia angustifolia.
Edwardsia microphylla.
Commelina cœlestis.
Ceanothus Azareus.

The following plants are killed to the ground every winter, or otherwise injured:

Verbena triphylla.
Amaryllis Belladonna.
Azalea Indica, var., albiflora.
Acacia armata.
Fuchsia Thomsoniana.
——— Virgata
——— Macrostemma
——— Thymifolia.
Apios tuberosa.

† The Third and last Report of the Registrar-general announces the

For this purpose the cases which have been treated at the Exeter Dispensary will be referred to. Those selected will comprehend the patients admitted to this charity during the ten years (viz., from 1825 to 1834 inclusive) which have hitherto occupied our attention; this period has been chosen in order that the local influence of climate, &c., may be better illustrated and compared.

The number which were admitted during this period, amounting to 11,258, is in every way adequate to give a fair and satisfactory view of the nature of disease as occurring in this district, especially as no restrictions prevail regarding the admission of patients. They are arranged under different classes, in which the whole of the diseases are brought in apposition with each other, together with a statement of the months in which they occurred; the average age, and the relative proportions of disease in each sex.

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gratifying and interesting fact that the mortality of the county of Devon has been gradually decreasing since 1837. Fewer die under one year of age than in any other county in England: the average mortality for the whole of England at this age, being 218 in 1000, while in Devon it is only 168. This low rate of mortality also holds good during the whole period of life under seventy, amounting in all England to 859 in 1000, while in Devon only to 773. After the age of seventy the mortality is increased as must necessarily be the consequence from its previous lower rate, the average being 140 in 1000 for England, and 227 for Devon.

TABLE I.	No. admd.	Male	Female	Av. age	Per cent.	Proportion.
Fever	1341	437	904	31	11·9	1-8 .. 530
Eruptive fever ...	80	31	49	8	·7	1-140
Rheumatism	456	237	219	42	4·	1-24 . 314
Dropsy	402	143	259	49	3·5	1-28
Scrofula	208	99	109	15	1·8	1-54 .. 26
Scirrhus	46	7	39	37	·4	1-244 .. 34
Dis. of brain	535	215	320	32	4·7	1-21 .. 23
Dis. of heart	114	50	64	37	1·	1-98 .. 86
Bronchitis	1211	482	729	38	10·7	1-9 .. 359
Phthisis	460	177	283	31	4· } 17	1-26 .. 29
Pneumonia	253	147	106	33	2·2	1-44 .. 126
Debility	265	55	210	31	2·3	1-42 .. 128
Diarrhœa	908	376	532	31	8·	1-12 .. 362
Dyspepsia	596	186	410	41	5·2 } 14½	1-22 .. 126
Dis. of liver	85	37	48	36	·7 } +	1-132 .. 38
Gastritis	43	12	31	39	·3	1-261 .. 35
Female dis.....	457	..	457	30	4·	1-24 .. 290
Eruptions	809	323	486	27	7·1	1-14
Dis. of Kidney ..	83	48	35	40	·7 +	1-135 .. 53
Worms	34	14	20	14	·3	1-331 .. 4
Bronchocele	39	1	38	29	·3 +	1-288 .. 26
Surgical, &c.	2833	1458	1375	32	25·1	¼
Total	11258	4535	6723	32	100·	
Proportion of males to females per cent.	100	40·2	59·8			

TABLE II.	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	TOTAL.
Fever	100	107	155	113	112	164	187	130	136	137	1341
Eruptive fever	2	2	4	15	4	5	18	9	13	8	80
Rheumatism .	38	28	38	46	25	47	39	43	66	86	456
Dropsy	36	31	36	30	39	30	61	45	44	50	402
Scrofula . ..	16	4	14	17	28	23	20	37	20	29	208
Scirrhus	1	4	1	6	11	5	7	4	2	5	46
Dis. of brain .	31	35	55	58	66	58	61	54	49	68	535
Dis. of heart .	3	..	4	6	11	21	14	15	13	27	114
Bronchitis ..	65	63	100	138	123	122	156	105	190	149	1211
Phthisis	25	43	29	44	38	42	60	66	64	49	460
Pneumonia ..	11	12	12	17	34	31	31	29	52	24	253
Debility	27	30	50	52	51	12	15	17	5	6	265
Diarrhœa ...	85	84	43	53	41	55	123	138	146	140	908
Dyspepsia ...	44	53	41	62	64	77	63	44	66	82	596
Dis. of liver .	6	1	7	9	2	4	13	16	18	9	85
Gastritis ...	11	2	1	1	5	..	6	8	6	3	43
Female dis. ..	30	19	20	16	49	56	53	56	78	80	457
Eruptions ..	64	66	66	82	66	95	92	95	91	92	809
Dis. of kidney	5	1	11	8	10	9	18	11	4	7	83
Worms	4	5	6	1	5	3	2	2	3	3	34
Bronchocele .	4	6	1	4	1	7	7	3	5	2	39
Surgical, &c. .	190	181	302	289	304	356	282	263	332	334	2833
Total ..	778	777	996	1067	1087	1222	1328	1190	1403	1390	11258

TABLE III.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Avge.
Fever	105	153	131	141	127	119	120	82	92	100	103	68	111
Eruptive fever	4	8	11	3	14	5	7	1	10	5	5	7	6+
Rheumatism .	40	43	50	59	49	51	34	33	25	23	23	26	38
Dropsy	39	37	29	43	37	36	35	35	24	34	32	21	33+
Scrofula	15	13	19	18	28	25	15	21	15	15	8	16	17+
Scirrhus	7	7	5	1	2	3	2	5	1	4	4	5	4
Dis. of brain .	39	61	52	63	60	51	40	29	25	45	39	31	44+
Dis. of heart .	11	5	13	11	15	14	10	6	8	8	7	6	9+
Bronchitis ..	107	153	127	147	136	80	127	55	53	53	77	96	100
Phthisis	40	38	52	44	40	42	32	40	37	36	32	27	38
Pneumonia ..	24	30	33	38	15	14	10	13	12	15	27	22	21
Debility	16	17	32	32	35	40	18	15	18	14	13	15	22
Diarrhœa ..	33	56	50	52	75	61	85	162	147	97	46	39	75+
Dyspepsia ..	48	36	55	62	72	54	50	53	46	45	41	34	50
Dis. of liver .	6	10	9	6	9	9	4	9	4	8	5	6	7
Gastritis	6	3	4	9	4	4	3	1	1	2	3	3	3+
Female dis. ..	37	38	37	51	42	48	48	43	22	28	36	27	38
Eruptions ..	69	81	74	78	89	74	72	43	44	68	66	51	67
Dis. of kidney	6	6	7	7	5	11	7	8	4	8	5	9	7
Worms	3	1	5	2	4	2	6	2	2	1	4	2	2+
Bronchocele .	6	1	5	2	1	1	3	6	4	4	4	2	3
Total ..	656	797	800	869	859	744	728	662	594	623	580	513	
Nos. per cent.	7·8	9·3	9·3	10·3	10·2	8·8	8·6	7·8	7·	7·4	6·8	6·	
Relative proportion	1-12	1-10	1-10	1-9	1-9	1-11	1-11	1-12	1-14	1-13	1-14	1-16	

Before making any comments upon these tables it is necessary to explain that the record of the exact nature of the disease is not always so specific as might be desired. For instance, a case of phthisis may be entered as one of cough simply, consequently such a case does not appear in the tables under its true designation; thus the number of cases of phthisis is lessened, while that of bronchitis, under which cough is comprehended, is proportionably augmented. These errors necessarily prevent any accurate numerical statement being made of the different lesions occurring in individual organs; but

that no inconvenience may arise, the cases are so grouped that the relative proportions of affections of the chest, abdomen, brain, &c., may be appreciated with sufficient accuracy, either as compared with each other or with the diseases generally included in the table. For instance, the diseases of the lungs may be seen to comprehend 17 per cent. of the whole diseases of the district, while those of the abdomen amount to but 14 per cent., and fevers only to 12.

Table I. which will be found useful for reference in the course of the following observations, is, by itself, chiefly interesting as showing at one view the proportional occurrence of the several classes of disease, together with the relative liability of sex and age. Thus the 11,258 cases consist of 4535 males and 6723 females, *i. e.*, 40 per cent. of the former and 60 per cent. of the latter, making an excess of 20 per cent. against female health; so that notwithstanding the number of females in Exeter are 10 per cent. in excess of the males, the latter forming 45 per cent. and the former 55 per cent. of the whole, yet we may infer they are more liable to disease than males. This holds good, although the 4 per cent. of diseases which are peculiar to females be deducted, as well as the 3 per cent. for debility, bronchocele, and scirrhus, which in great measure are proper to and consequent upon the peculiar organization of this sex; for there remains an excess

of 5 per cent. in the sickness which is common to both sexes. It may, however, be supposed that females apply for advice under circumstances of slighter affection than males; though to a certain extent this may be true, yet there can be no doubt disease is more frequent among them.

It may be mentioned here that Mr. Farr's letter, which accompanies the report of the registrar-general, in many respects bears out the preceding tables, with regard to the relative frequency of the several diseases in different sexes; thus according to both, males are more susceptible of pneumonia and diabetes, and females of scirrhus and phthisis, &c.

The average age of those admitted is thirty-two years. It is obvious, however, that it cannot be satisfactorily asserted that this is the period of life most susceptible of disease; we shall not therefore dwell upon this subject, but merely state that an average drawn from the whole list of diseases is liable to an error which does not obtain when applied to the individual affections.

Table II. is interesting as showing the relative proportion of disease in each year. The gradual increase in the total number of admissions which is observable is not to be attributed to any progressive increase of disease, but to an extension of the charity during this period.

In Table III. the 2833 surgical cases, which form

part of the other two tables, are omitted. The remaining 8425 are so arranged as to show the relative frequency of each disease during the several months of the year. This table is particularly interesting; from it we see that February, March, April, May, June, and July, constitute what may be called the more sickly period of the year, but that the spring months of April and May are those in which the greatest amount of sickness prevails. The climate of these two months is characterized by some peculiarities which are worthy of notice. It is between the months of April and May that the rise in temperature is most considerable, amounting to more than one half of the whole difference which takes place in the temperature between spring and summer; moreover, the difference in temperature between day and night, *i. e.*, between the diurnal maximum and minimum, is more marked than in any of the other months, amounting in April to nearly 39°, and in May to 34½°, (30° being the mean diurnal difference during the year.)

The mean barometric height is lower during these two months than in either of the two months which immediately precede or succeed them, being in March 29·98, and in June 29·95; while in April it is only 29·83, and in May 29·87. The following table shows the mean maximum and minimum dew-point, with the attendant observations:

		Dew-point	Barom.	Therm.	Wind	Weather
April	Max.	49·8	29·56	50·6	S.E.	Rainy.
	Min.	32·2	29·96	42·2	N.	Fair.
May	Max.	55·0	30·00	59·4	S.E.	Fair.
	Min.	40·2	29·79	50·8	N.E.	Fair.

The winds which particularly prevail during these months are the north, north-east, and south-east which impart an unusually dry character to the atmosphere; we therefore find them, notwithstanding the frequent occurrence of partial showers, to be months in which the amount of rain that falls is very small; May, indeed, is the least rainy month in the year, the average fall being only one ninth of an inch. In April it amounts to two fifths; a portion of this falls in storms of hail, to which this month is liable, though they but rarely occur in this climate as compared with other parts of England. April and May are also characterized by having more sunshiny days than the other months; this is a point of much interest, especially when the diurnal variations of temperature are taken into account. We see, therefore, that these, the most sickly months in the year, are characterized by a sudden increase of temperature, by warm days and cold nights, by an atmosphere which is dry and has a great capacity for moisture, by the fall of but little rain, and by a seductive sunshine. On reference to the table we observe that the diseases which more particularly

make up the increase in number are, in April, fever, rheumatism, dropsy, diseases of the brain, bronchitis, and pneumonia, dyspepsia, gastritis, and diseases peculiar to females; in May, eruptive fevers, scrofula, diseases of the brain and heart, bronchitis, dyspepsia, and eruptive complaints. It must, however, be understood that it does not follow, because these months are noted for a greater prevalence of disease, that they are also attended by the greatest mortality; on the contrary, they are rather below the average in this respect.*

The period of the year in which the least amount of disease prevails extends from August to January. From the table, No. 3, it might be inferred that December is particularly healthy; but as regards this month, as likewise November to a slight extent, a source of inaccuracy† obtains, which entirely stultifies such an inference. We are inclined to state that September and October constitute the period more especially free from sickness, and that September is by far the healthiest month of the year; we shall therefore draw attention to the climate of this month. It is characterized by a mean temperature of 56°·9, the mean maximum being 71°·1,

* Vide postea.

† The inaccuracy alluded to is owing to a deficiency at this period of the recommendations by which patients are admitted; being the end of the year these become scarce, and consequently fewer patients are enabled to present themselves for the benefit of the charity.

and the minimum 42°·1, giving a mean diurnal difference of only 29°. The decrement in temperature which takes place between August and this month is very considerable, amounting to nearly 6°. The barometer stands at 29·87, with a mean range of one inch. The mean maximum and minimum dew-point, with corresponding observations, are as follow:

		Dew-point	Barom.	Therm.	Wind.	Weather
Sept.	Max.	59·4	29·52	61·6	S.	Rainy.
	Min.	42·6	29·80	54·0	N.W.	Fair.

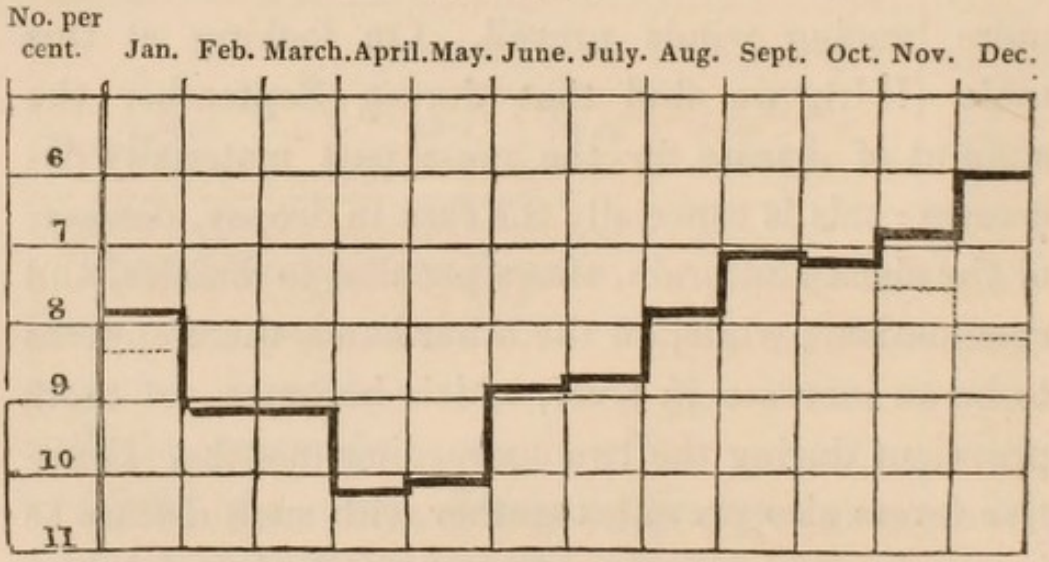
Though there is much sunshine in September, yet there are many days (13) during which a large quantity of rain is precipitated; this is also the case with the succeeding month. The prevailing winds are from the west; occasionally there is thunder, very seldom hail, and no snow. From the above we see that this month is rather colder than the mean of the climate, and, comparatively speaking, is attended with only slight changes in the diurnal temperature; we also see that the temperature of the dew-point at its maximum is very near to that of the atmosphere, and very distant at its minimum, so that the air is moist when the temperature is high, and dry when it is low. We may therefore fairly conclude that an equable temperature, attended by a moist warm atmosphere, or, in other words, the "muggy" Devonshire weather is congenial to health,

while dry easterly winds and a variable temperature are peculiarly obnoxious to it. This bears out the observation I had long since made, independently of these tables, that the inhabitants of South Devon, especially if afflicted by chest disease, do not suffer in health so materially during this commonly-styled unwholesome weather as when the more bracing winds prevail. On looking at this table (III.), we find that during September the amount of disease for the most part materially decreases; this is especially the case in dropsy, diseases of the chest and brain, those peculiar to females, and rheumatism; while, on the other hand, there appears to be an increase in fever, which becomes yet more prevalent during the two succeeding months. Eruptive fevers also prevail, together with such disease as is more prominently characterized by debility. Diarrhœa, the prevailing disorder of August, and dyspepsia, which more particularly swell the amount of disease in September, are nevertheless on the decline, and materially lessen in frequency towards its conclusion and during the succeeding month.

In order to show the relative mortality of the several months, the following little diagram is subjoined. The error which prevails in the statement of disease during December, as also to a slighter extent in November and January, has been previously alluded to. In the diagram the thick lines exemplify the real numbers per cent. as entered in

the books of the Dispensary during each month. The dotted lines represent what may be considered as a more true approximation to the real occurrence of disease.

Diagram, showing the relative number per cent. of sick persons in each month.



Before entering upon the consideration of the diseases in detail, it may be remarked that this district, in common with other parts of the kingdom, suffers occasionally from the occurrence of epidemics. In the published annals of Exeter mention is made of the frequent infliction of plagues and sicknesses, attended by very marked mortalities; but beyond this bare notice there is so little that is definite or characteristic that any lengthened detail of them would be useless.

Within my own observation the general aspect of disease has partaken of two very separate and

distinct characters. During the few years immediately preceding 1828, affections of the serous membranes for the most part prevailed; thus the cases chiefly met with were those of pleuritis, peritonitis, and, amongst children, hydrocephalus, all exhibiting a type of disease requiring the most prompt and persevering antiphlogistic treatment. Since that period, however, diseases having their origin in the mucous membranes, or else involving them in their course, have been of the most usual occurrence, and these have required a treatment rather mild than heroic; experience soon showed that the type of disease was changed, and the method of cure which had been previously requisite was anything but applicable.

I shall now cursorily allude to the more recent epidemics. In 1825, inflammations of the serous membranes were exceedingly prevalent; peritonitis, in its severest forms, was of common occurrence, and, amongst children, hydrocephalus was so frequent as really to justify one in styling it an epidemic. During the autumn of 1829, English cholera in its most rapid and urgent forms occurred, and was attended by a very signal mortality. In 1831, an influenza of a severe character prevailed. 1832 was conspicuous, during the months of July and August, for the prevalence of the malignant cholera. In 1834, a slighter influenza occurred. In 1836, smallpox; followed, in 1837, by hooping-

cough, and then by scarlet fever: each of these infantile diseases during this period was very fatal in its consequences. In 1837, influenza again prevailed; it was very general, and attended, as was the case throughout England, with a severe and painful series of symptoms; and in the spring of 1838, a peculiar form of spotted fever occurred. As these various epidemics will be mentioned when speaking of the several groups of disease composing the above tables, we shall not dwell further on them here.

Fever. From the tables which have just been stated, we see that out of 11,258 cases, 1341 consist of fever; so that nearly one in nine, or 12 per cent. of the diseases which occur in the district, are of this character. This is a larger average than I anticipated. It had always appeared to me that Exeter was peculiarly free, comparatively speaking, from its influence; and, which it certainly is, from its worst and most fatal aspects. It must, however, not only be borne in mind that the above amount comprehends all the milder forms of continued simple fever, as well as the more confirmed cases of typhus, but also that the cases are selected from that part of the population, which, from the nature of their employment, and the scantiness of their means of subsistence, are peculiarly prone to it; and that the cases are taken from the residents in a city, which increases the liability over a country district to the

enormous amount of 55 per cent.* Nevertheless, large as is the above proportion, this can by no means be considered a locality particularly favorable to the development of fever, for the average is considerably lower than in many of the other large towns in the kingdom, as London, Edinburgh, Glasgow, Dublin, Worcester, Bristol, &c. As might have been expected, fever varies, both in its absolute and relative frequency, in different years and months. With regard to its absolute frequency, nothing positive can be stated, for in this respect the tables are incomplete, as previously pointed out. The relative frequency of its occurrence in different years varies from one tenth to one sixth of the whole cases admitted, *i. e.*, from 15·5 to 9·6 per cent., as may be seen in the following table:

TABLE IV.—*Showing the proportion per cent. of fever cases which occurred in ten successive years.*

1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
12·8	13·7	15·5	10·5	10·3	13·4	14·	10·8	9·6	9·8

In 1827, the year in which the greatest proportion of fever cases occurred, the climate presented nothing very remarkable; the temperature, as well as the rain which fell, being only rather above the mean. In the two preceding years, 1826 and 1825, in which

* Letter to Registrar-general, p. 21.

the proportion of fever cases was also large, the climate was warm and rather dry; while, in 1833, when the weather was cold and rainy, and in 1834, a year characterized by dry and temperate seasons, the proportion of fever cases was low. In order to appreciate the relative tendency to fever in each month the following table is constructed.

TABLE V.—*Showing the relative proportion per cent. of fever cases occurring in each month.*

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
8	11	9	10	8	8	8	6	6	7	7	5

This table shows that February is the month the most prone to fever, and that August and September are the least so, as is also the case in a lesser degree with the three preceding and two following months; it has elsewhere been pointed out why December should not be taken into account. We see therefore that the fine cold bracing weather, which people so usually congratulate themselves upon as being free from fever, is really the weather most liable to it; while the warm and sultry months of summer are those in which it least prevails. It is not a little remarkable that in 1827, when the greatest proportion of fever cases occurred, the fewest number of deaths took place;* while in 1833 and

* Vide postea.

1834, years in which the proportion of fever was but small, the amount of deaths was above the average. The same observation also holds good, as regards the months; for August and September, which, of all the months are the most fatal, are seen to be the most free from fever; while February, the least fatal, is the most prone to its attacks: so that it might almost be inferred that fever is not a fatal disease here, as also that the circumstances, which tend to originate it, are not those which involve a large amount of mortality. This somewhat bears out the impression that fever in its severest forms is not a disease very common in this district.

With regard to period of life, it appears that adult age is the most obnoxious to fever. The average age given by these 1341 cases is thirty-one; this is considerably younger than the average of cases treated and reported by Dr. Craigie,* the mean age of which amounted to forty-five; and a more advanced period of life than those reported by Dr. Tweedie,† whose greatest amount of cases occurred between the ages of twenty and twenty-five.

The fevers of this district are for the most part simple synochus and typhus. Cases of synocha I believe to be very rare,—certainly so, as far as my own observation goes. I have scarcely seen a case of well-marked inflammatory simple fever. Gene-

* Edinburgh Review, vol. xlvi.

† Cyclopædia of Practical Medicine, vol. ii. p. 189.

rally speaking, the cases of fever which occur are accompanied by local inflammation in some one or other of the great organs of the body. There can be no doubt, however, that examples of fever, with sufficiently and even strongly-characterized symptoms are sometimes met with, in which no indications whatever of local lesion are discoverable, either during life, or after death, on the minutest *post mortem* examination. I cannot, therefore, but entertain the strongest conviction of the existence of primary and essential fever; in fact, I feel thoroughly assured, from the opportunities of observation which this district has afforded me, that all the different forms of continued fever, whether they be the simple or the inflammatory continued fever, or even typhus itself, may exist and really go through their several stages without any necessary attendant lesion. I am aware that this is a view which does not generally obtain in the present day; and perchance it may be advanced against it that the observations of Louis, which more particularly refer to typhus, are directly in opposition to it. The views and statements of this greatest of our modern observers have been however differently interpreted by me. He by no means asserts that to a diseased condition of the glands of Peyer is to be attributed *the cause* of typhus, but, from the constancy with which he met with lesion there, after death from this disease, such condition may be considered inseparable

from its existence, and constituting its anatomical character. Though I am strongly inclined to believe that fever, properly so called, does not originate in consequence of derangement either of the solids or fluids, and that many of the cases, which I have had the opportunity of watching, exhibited at their commencement no characters but what may be referable to functional disorder alone, yet by far the greater proportion, in fact nearly the whole, as previously mentioned, presented traces sufficiently evident of the presence of some local inflammation. In many of these the organic complication was seen to be superinduced as epidemic influence or personal peculiarity determined. This may fairly be assumed from its not being infrequently observed, that at certain seasons there is almost an indiscriminate tendency to affections of a particular organ; while at other times, when simple fever only is epidemic, different organs become affected, as constitutional predisposition may direct. In this district then it may be stated that cases of simple and uncomplicated fever do not very often occur, a statement which is particularly true amongst the class of patients from which these returns have been made; for cases of pure fever are proportionately much less frequent amongst the working classes than in the better ranks of life. This is doubtless owing to the former receiving the infection of fever under circumstances with which an exposure to the causes of local inflammation is associated.

As far as my own observation goes, the adynamic typhus fever, as occurring in Exeter, is most frequently complicated with affection of the mucous membranes of the stomach and bowels, then with the viscera of the chest, and more rarely with the brain. In the other and more simple fevers of the district, the chest is most frequently attacked, then the abdomen, and then the brain. In placing complication with the cerebrum thus low, I am of course referring to the early stages of fever, and not to any symptomatic disorder which may supervene towards the fatal close. When the brain is primarily affected, it is generally by congestion, accompanied by low muttering delirium, with coherence when roused; active and violent delirium is comparatively rare. It seldom assumes an epidemic character; but occurs more usually in a few cases only, and at the same time with others which are characterized by different and more general complications. When cerebral affection occurs, it may for the most part be observed that not only is it complicated with lesion of other organs, but that most usually the presence of these lesions had been previously manifested. Affection of the chest, as already observed, most frequently prevails in the ordinary simple fevers; it is in fact very rarely that cases of synochus even if not complicated with the more urgent derangements of the chest, are not attended by some short irritating dry cough, becoming moist

after a day or two. I have indeed frequently discovered, by the stethoscope, in very slight cases of fever, when even the patient himself has not directed attention to any inconvenience of the chest, sufficiently well-marked symptoms of a dry catarrh. Fever, with pulmonic complication, occurs chiefly during the winter and spring. It has always appeared to me that, in these cases, the greatest amount of inflammatory action takes place with the least tendency to cerebral disorder.

A difference of opinion exists as to fever causing tuberculous deposit in those predisposed to it. I cannot but think that I have seen in more than one instance the symptoms of a fatal consumption, which previously had not manifested itself, fully developed immediately after an attack of fever, and on comparing the returns of phthisis with those of fever, as set forth in the tables quoted above, it will be seen that the average age at which each of these diseases prevails is the same, viz., thirty-one. This, however, can only be hazarded as a very distant corroboration of such a view.

The fevers complicated with stomach and intestinal affections are those which present for the most part the adynamic form. They commence in a state of low irritability, which is but rarely succeeded by any marked symptoms of reaction. They are usually accompanied by pain and uneasiness of the stomach, aggravated on pressure, and not unfrequently at-

tended by a constant and most distressing sickness. When this is the case the tongue is sufficiently indicative of gastric irritation, its tip and edges being usually red and glossy, as if raw; while its surface, generally whitened, presents a spotted appearance from the raised state of the papillæ. The bowels are easily acted on, and if once set in motion difficult to control, the skin early becomes dry and harsh, the thirst excessive, and the pulse small and quick. On fevers thus complicated running a bad course, the patient is much distressed by the mouth becoming aphthous, ulcerated, and covered with sordes, and, though rarely, by troublesome sloughings of the tonsils, pharynx, and œsophagus. These inconveniences supervene, more especially, when children are the subject of this kind of fever, and in them they present indications of much danger. In adults however, these local aggravations are not so dangerous as troublesome; in them they are usually relieved by treatment, and disappear as the general symptoms decline. This form of fever prevails for the most part in hot summers and towards the autumn. It more rarely occurs in the winter and spring.

Fever, complicated with pain and inflammation of the liver, though sometimes met with, is certainly not frequent; in fact, acute forms of liver disease, whether idiopathic or in connexion with fever, are certainly not common in the district.

The febrile eruptive symptoms of the skin, though prevailing extensively at times, are not, generally speaking, of frequent occurrence. The most usual form is that of petechiæ; vibices and maculæ being comparatively unfrequent. My own observation leads me to think that the cases in which the former occur, are more often manageable than otherwise; while the occurrence of the latter indicates a state of the system which usually proves fatal.

A peculiar form of spotted fever was epidemic here in 1836. The eruption, though at first sight very similar to petechiæ, on closer examination presented many characters sufficiently different to mark it as totally distinct. Nor can it be considered as having any affinity to the white miliary eruption which is occasionally seen to accompany epidemic gastric fever. In fact it may be said that this spotted fever was a peculiar kind of typhus, attended by an exanthematous rash. The skin within twenty-four hours after the febrile attack became generally darkened in colour and spotted over, especially on the chest and arms, with dots of a brownish red, sometimes passing into purplish. These dots were larger than petechiæ, and, instead of having defined margins like these latter, passed off gradually into the deepened colour of the surrounding surface. I am inclined to view this as a vesicular eruption, for not only did many of the dots eventually assume this character, but generally the sequence was a desqua-

mation of the cuticle. This fever, which was generally of an adynamic character, usually set in with the most overwhelming feeling of lassitude and depression; headach, but no very marked mental disability, (excepting in three cases, which occurred in one family; in these, low murmuring delirium continued for nearly three days;) countenance anxious; eyes suffused; pulse quick, small, and wiry; tongue moist, without any very marked coat, though generally whitish, in some cases florid towards the extreme tip, and in subsequent stages, towards its centre and back part, of a moist brown; slight cough; bowels more relaxed than otherwise, and at all times very easily acted on by medicine; no great degree of thirst; the skin warm, though by no means burning. The eruption made its appearance on the second day after the fever, and on the fourth or fifth usually declined. In these cases bleeding and strong purgatives appeared to exercise a most untoward influence; while saline medicines, combined with aromatics, were peculiarly useful. On following this plan of treatment I may almost say not a single case proved fatal.

In 1839 and 1840, fever assumed a hemorrhagic tendency, and many died in consequence of the bloody discharges poured from the bowels, and which no means appeared capable of restraining.

During the last ten years it has occurred twice if not three times that the external mucous surfaces in

children, during a scarcely appreciable attack of fever, have shown a great liability to take on an inflammation of a bad character, attended by copious muco-puriform discharges. In 1834, this was peculiarly the case with the female organs of generation; so much so, that if seen without a knowledge of the presence of fever and its epidemic character, suspicion might have been raised that disease had been communicated attended with violence.

In October 1841, a low fever, accompanied with diarrhœa, prevailed amongst children, when the throat, (from which in some cases false membranes were thrown off,) as well as the conjunctiva became inflamed; the eyelids, generally swollen, with difficulty permitted the state of the ball to be observed; soon the secretion became copious, and so tenacious as almost to preclude the possibility of the eye being opened, so that the acrid discharge being pent up, the little sufferer, in case of life being spared, recovered, with the eye materially injured, if not entirely destroyed.

A few words on the nature of the treatment which fever has required at different periods may not be inapplicable here, as further exemplifying the changeableness of its epidemic character. Preceding and about the year 1826, fever required the most prompt and extensive antiphlogistic management. On its first onset the free use of the lancet and smart purgatives were imperatively called for. Of

late years such a course of treatment would have been followed by consequences the most disastrous; a fever so treated would inevitably pass into a state of low collapse, from which no efforts could recall the system. In fact, for some years past, the free use of evacuants has been almost entirely precluded; the only treatment admissible has been slight purgatives, with mild saline medicines, to which, on occasion, might be added some gentle diffusible stimulants, as small doses of ammonia, with a little aromatic confection, valerian, &c. The fevers which occurred before and during 1826 were for the most part of an inflammatory character; while those prevailing latterly have been adynamic and more closely allied to true typhus.

Intermittent fever is of very rare occurrence; occasionally a case may present itself; but, generally speaking, it is not a form of disease proper to this district. In 1826 and 1827, a few cases occurred, but these were chiefly amongst the excavators of the canal, which was then in the course of extension. These men were exposed, by the nature of the work they were engaged in, to an influence peculiarly fitted for its development. The neighbourhood, however, presents generally no conditions likely to originate fevers of this character.

I may incidentally allude here to two cases which in some respects are remarkable. In the one, the exciting cause was fright, and a true tertian fol-

lowed; it occurred in a young girl, aged nine. In the other, a lady, generally resident in Lincolnshire, after staying a month in this city, took a little tour in the neighbourhood for ten days, and then, on returning to it, was attacked by a quotidian in its severest form. She had never, during her residence in Lincolnshire, suffered from any form of intermittent disease.

ERUPTIVE FEVERS. Though sporadic cases of several eruptive fevers are occasionally met with, yet, for the most part, they may be said to occur only epidemically — a considerable period usually intervenes between their reappearance, and then great numbers are affected at the same time.

MEASLES. This affection does not offer in its occurrence any local peculiarities worthy of remark. In 1831, many cases occurred. In 1836 this infantile disease was extensively epidemic; many of the cases were of a malignant form, and numerous deaths took place in consequence. Generally speaking, however, it is mild in its character. The recurrence of this disease does not appear, as far as I have observed, to belong exclusively to any particular season of the year, nor to any particular kind of weather; it breaks out indiscriminately at all seasons, whether they be dry or moist, hot or cold. During the ten years in which these returns were

made, measles frequently occurred, but at the two periods above mentioned it was more particularly prevalent. Amongst the lower orders the after effects are often very severe; those most so are coughs and general affection of the chest, disorder and suppuration in the auditory passages, and general weakness of the constitution.

Scarlet Fever has occurred in an epidemic form several times. In 1832 and 1833 there were many cases; in the latter year, several persons of advanced age were attacked. Scarlet fever in this district is usually mild and very manageable, so much so that the lower orders rarely apply for medical assistance. Sometimes it takes on a severe character. In May and June 1837, it was not only very generally epidemic, but assumed a peculiarly bad aspect. The cases were for the most part of the malignant kind, and accompanied by the worst form of sore throat; children in great numbers fell victims to its influence. During the continuance of this epidemic, many differences from the more usual course of scarlatina were presented. I have observed the eruption come out in the natural way, go through its course, and followed by every appearance of convalescence, when relapse has taken place, and the sore throat, together with the eruptive fever, again become re-established. At other times I have seen the eruption assume so completely the cha-

racter of measles, that had it not been for the presence of sore throat there would have been great difficulty in distinguishing it. In some cases, again, it assumed the vesicular form, the whole surface being covered over with small papulæ; in others the scarlet eruption assumed a dull livid hue, and was interspersed with dark-coloured spots, resembling *petechiæ*, but which I am disposed to think were not identical with them. The fever, which usually set in with headach, vomiting, and rigor, on close questioning, had evidently been some two or three days preceded by sore throat.

In all these varieties of scarlet fever, the countenance became pale and fallen; the throat swelled rapidly; the skin early lost the marked scalding character proper to this affection, and assumed a subdued colour; the pulse was small and rapid; a constant diarrhœa early supervened of a most offensive nature; and, in the more urgent cases, convulsions, coma, and death ensued. Though apparently of an inflammatory character, yet the ordinary means, depletion, purgatives, and cold affusion, appeared particularly hazardous; under such a course of treatment life seemed to vanish, so silently and rapidly did the vital powers subside. The exhibition of opium, either in draught or by enema, appeared to me singularly inapplicable; certainly in cases where it was administered a fatal termination

early took place. In fact so disheartening was the result of the most varied methods pursued, that one was inclined to think treatment useless. Almost with this impression, certainly with a prejudice against it, I adopted Dr. Peart's plan of freely administering ammonia; and with the most complete success. Under its influence the patient cooled, the throat recovered its healthy appearance, the pulse its tone, and indeed subsidence of the more urgent symptoms quickly ensued. The promptness of relief thus afforded is particularly serviceable, as counteracting the after lesions which so commonly take place in the throat, these rarely becoming confirmed until after the fifth day, so that I cannot but view ammonia as a most valuable medicine in this disease when attended by putrid sore throat. A medical friend tells me he found equal success in the nitro-muriatic mixture.

During this epidemic the number of deaths was very great, frequently two or three in the same family fell victims to its influence.

Towards the latter end of 1841 and the commencement of 1842 scarlet fever was again epidemic, and attended by the same low inflammatory character as in 1837 ; and I was happy to find that the liberal use of ammonia was attended by the same results; not only were present symptoms relieved, and danger almost invariably arrested by its use; but I observed

that the patients stepped as it were immediately from the sick bed into health; there was nothing like a protracted convalescence.

During these epidemics the contagiousness of scarlet fever was most fully manifested: in fact so intense was the power of this principle, that in houses where cases occurred, persons of mature age who had previously had it were attacked by an irritative fever, accompanied by putrid sore throat; in some of these there was even an irregular efflorescence of the skin. As illustrative of the persistency of its contagiousness, I may mention the following: A young lady had this affection; two months after her most perfect recovery I was consulted as to the safety of her visiting some distant relatives where children were. The assurance was ventured of perfect safety. To my surprise, in two distant houses where these visits were paid, the scarlet fever broke out. There could be traced no other previous cases in either neighbourhood, so that the only conclusion to be arrived at was that the contagious principle had been retained and conveyed by this young lady. This occurred in the autumn and winter of 1840.

The after effects of scarlet fever are not often very prominent in this district. Though dropsy with coagulable urine occasionally takes place, yet it is by no means so frequent as reported in other places. Perhaps the most troublesome of the after

affections are running at the ears and an enlarged state of the tonsils. For this latter affection I believe there is no cure but time, at least no means that I have ever seen employed for dispelling the swelling have succeeded; with regard to the former tonic diet and counter-irritation behind the ears often effect much; occasionally the hydriodate of potassa appears useful; good effects also often follow the local application of iodurate of lead ointment warmed and dropped into the ear. After the use of ammonia, however, the subsequent effects of scarlet fever are far from frequent, forming the exception rather than the ordinary course.

Smallpox is occasionally epidemic; it was so in 1837 and in 1841. Excepting on such occasions, cases are rarely met with. In May and June, 1837, it was very general, and peculiarly fatal; the number of deaths which took place in this city and the immediate neighbourhood was very considerable. The cases which occurred assumed every aspect, from the mildest to the severest forms. In many the pustules took on a dark colour very early in their course, and as the disease progressed became almost black; for the most part these cases terminated fatally.

In October and November, 1841, it assumed a particulary low type, the pustule rising flattened in the centre, waxy in appearance, and after the second

day becoming of a dark colour; it very rarely filled out and followed the usual course. The breathing was oppressed, the pulse quick and small, the thirst excessive, and generally speaking the continued moaning and crying of the younger sufferers indicated a considerable amount of pain. These cases required stimulants and backing up; a great many however resisted every attempt at cure; amongst those who recovered a general anasarca was not unusual, but not attended by a coagulable urine.

Several instances of secondary infection took place during both these epidemics; some of them were after previous inoculation, some after vaccination; the proportion of these latter to the whole number attacked, however, was not very considerable, certainly did not exceed one in twenty. Those cases which occurred after smallpox were for the most part severe, while those after vaccination were mild, and terminated favorably; in fact, after making every enquiry, I could not learn that a single death took place in consequence. Many cases I am fully persuaded are called secondary smallpox which are really primary, for there can be no doubt that security is often placed in an imperfect vaccination. It is too commonly the case that the different stages of the vaccine vesicle are not properly attended to: this, amongst the lower orders, is often owing to the carelessness of the parents, who, after the opera-

tion, do not submit the arm to the observation of the surgeon; if it rise *at all*, they are satisfied. Though doubtless during this period the cases which occurred after vaccination were the true varioloid disease, yet I am inclined to think that, at other times, many affections, such as were formerly placed to the account of swinepox, chickenpox, &c., are now all set down as secondary smallpox. I have certainly seen cases called varioloid, which appeared to me nothing more than swinepox. Notwithstanding vaccination is daily making rapid advances in public estimation, as well amongst the lower orders as the well educated, yet, if the smallpox be not in the neighbourhood, there is some difficulty in inducing the poor to have their children vaccinated; when there is no pressing danger to be apprehended, they are careless. The men offer more opposition to vaccination than their wives. Many instances have occurred where the women evinced the greatest anxiety about it, but were thwarted in their wishes by the obstinacy of their husbands. Should however danger make its appearance, by smallpox breaking out, then numbers crowd in from all parts, anxiously soliciting gratuitous vaccination; sometimes it is requested, at the same moment, for five or six of one family; evidence very sufficient of previous neglect.

Revaccination is often resorted to; I have watched

its progress in a great many cases; and, where satisfied of a previously efficient vaccination, have *never* seen it go through a regular progress, or in any way present a vesicle from which lymph ought to be taken. The conviction therefore presses itself upon me that there is no other use in revaccination than as a test of the regularity of the previous vesicle. In this respect it appears to be eminently useful, and by no means to be neglected where the slightest doubt is entertained. I should however be inclined to regard the test as incomplete, unless there were present very sensible evidence of the specific virus being absorbed, as indicated by the formation of an irregular vesicle, attended by a certain degree of surrounding inflammation. It is too often the practice to insert from a glass into the arm a small quantity of the dried virus, and then, because no effect has followed, to proclaim that the patient resists the infection in consequence of the previous operation. Thus an imperfect attempt not only lulls into a false security, but by its failure, throws undue discredit upon the protective power of vaccination.

It may not be inappropriate here to mention the numbers vaccinated at the Dispensary during the last few years. It will mark the confidence which the lower orders repose in it.

Years	Numbers Vaccinated
1834	614
1835	525
1836	430
1837	461
1838	510
1839	515
1840	502
1841	615

Swinepox, Chickenpox, &c. It was mentioned above that these affections were often mistaken for, and called, secondary smallpox; this happened in 1839, when a great number of these cases occurred. They evidently, however, were not a modified smallpox; and in confirmation of it, during their prevalence there was no case, as far as I am aware, of true smallpox in the city. Nevertheless, it was currently reported that such and such persons had the smallpox, and that vaccination had failed to protect them.

Rheumatism, Lumbago, Gout, &c., though not infrequent disorders of the district, are yet by no means so prevalent as in many other parts of the kingdom,—the number of cases forming about 4 per cent., or 1 in 24 of the whole registered diseases; while, in Penzance, they constitute 1 in 17·6; in Plymouth, 1 in 18·4; in London, 1 in 14·7; and in the north of England, 1 in 22.* Rheumatism chiefly attacks

* British and Foreign Medical Review, vol. vi. p. 14.

adults and those advanced in years; the average age given by the tables is forty-three. The cases which occur consist chiefly of subacute rheumatism, rheumatic gout, and more especially of chronic rheumatism. Acute rheumatism is only occasionally met with. The various forms of this disorder occur during every period of the year, but the months of March, April, May, and June, constitute the season in which they chiefly prevail; while, during the autumn, they are evidently upon the decrease. In the March and April of 1833, there were a number of cases of rheumatic fever: the former month was unusually cold and dry, with rather a low range of the barometer; the latter was cold and wet. Climate, however, does not appear to exert so great an influence upon rheumatism as is generally thought to be the case; at least such to a certain extent may be inferred from the fact of its not being so frequent here as in the north of England, nor in the north of England as in the milder climates of Plymouth and Penzance.

Rheumatic affections, though often distorting and preventing free action of the joints, are not generally dangerous in their effects, excepting in those cases where metastatis to the heart takes place; this is unfortunately frequent, and, I believe, one of the chief sources of disease in this organ. The usual treatment resorted to, with varying success, is the exhibition of colchicum, Dover's powder, guaiacum, and the hydriodate of potass; in some cases of old

standing I have seen the *oleum jecinoris aselli* of service. Externally, much benefit is often derived from the use of moist stimulating poultices. I have examined the urine of a large number of rheumatic patients, and have found it invariably very deficient in urea—which has been, in favorable cases, increased by the administration of colchicum.

Dropsy is in this district more frequent than appears to be the case in many other places; it forms $3\frac{1}{2}$ per cent., or 1 in 28 of the whole diseases. How far this prevalence is owing to the moisture of the climate is difficult to determine. It is, however, a common belief that dropsy is more frequent in places where the atmosphere is generally charged with moisture: the theory of which is, that a climate of this nature produces a preternatural fulness of the blood-vessels by retarding the flow of blood in the veins; hence (assuming such to be a predisposing state of the system) upon any defect arising in the compensating functions of the kidneys or other excretories of the animal fluids, dropsy ensues. The cases of dropsy which constitute the greater proportion in this report are anasarca, and occur for the most part in those whose constitutions are broken down by other diseases, or in old persons attacked by inflammatory disorders. In young females it is sometimes caused by the disturbed state of the constitution, consequent upon uterine de-

rangements. Generally speaking, the number of cases is much the same at all periods of the year; to a certain extent however it may be said that more occur in April, and fewer in September.

In an able summary of the reports of diseases from several towns, in the sixth volume of the 'British and Foreign Medical Review,' it is remarked that the proportional occurrence of dropsy in any district furnishes a fair index of its morality—the prevalence of intoxication, and of spirit drinking especially, being indicated by the amount of dropsy. As far as this district is concerned, such an inference can by no means be drawn; for its inhabitants are not particulary addicted to intoxication, and certainly not to the indiscriminate and free use of ardent spirits. As a proof that dropsy owes its origin to some other source, it is comparatively rare to find the nutmeg liver in connexion with it. The great amount of the dropsy of this district rather seems owing to the general deprivation, so constant amongst the poor, and to the want of sufficient clothing, and care, on exposure after sickness.

Dropsy, with a coagulable state of the urine, is occasionally met with; at the public institutions of Exeter there are usually two or three cases under treatment. Diabetes mellitus and insipidus are by no means uncommon, and occur chiefly in males. Every case of true diabetes that has come under my observation has terminated in tubercular consump-

tion. This has been so uniformly the case, that the conviction forces itself upon me of its being essentially a symptom of scrofulous disease, and that the kidney is made to be an emunctory of those matters, otherwise colliquatively discharged by the skin.

Scrofula is more frequent than in the midland counties; it constitutes in this district 1 in 54 of the whole number of cases,—that is to say, nearly 2 per cent. It may generally be said that scrofula presents itself under no peculiar form; every variety being at times to be met with. In the treatment, mercury, as far as my own observation goes, is injurious; it appears to irritate the symptoms, and if there be ulcerated surfaces to aggravate and extend them. Much benefit is derived by the exhibition of the several preparations of iodine; the absorbent effects which the ioduret of lead possesses in the case of enlarged glands has struck me as very remarkable. In children, lime-water and burnt sponge are frequently given with the utmost service.

Amongst the cases of scrofula a few of *noli me tangere* are recorded. A medical friend tells me he has found great benefit in these cases from the use of the ammoniated copper. From my own experience, I can say nothing of this medicine. Mr. James has applied, with the completest success, a compound of the chloride of zinc with sulphate of lime (plaster of Paris) in the proportion of one

of the former to three of the latter. This is moistened and applied on lint over a small portion of the diseased surface; after about five days it falls off, exposing a healthy-looking sore, which readily heals on the application of simple dressing. Other portions are then similarly treated until the cure is effected.

SCIRRHUS occurs in about the usual average, i. e., about 1 in 244. How far this affection is curable by the aid of medicine is generally esteemed doubtful. For my own part, I am convinced that in the early stages of true scirrhus of the mamma, success may attend its exhibition. In several instances it has appeared to me that cure has followed the assiduous use, both internal and external, of iodine. A case of *cheloid disease* has for some years past presented itself to my observation. As far as permanent cure is concerned, it has proved refractory; all that I have been able to do has been to quiet symptoms as they have arisen. The case, which is now of some years' standing, originated in a blow upon the right mamma. The disease first showed itself by slight swelling, followed by ordinary superficial abscess, about the size of a nut; afterwards small nodules arose, from which exuded a thin ichorous fluid. On these surfaces healing, the characteristic cicatrices were formed. This process has gone on from time to time, until the whole structure of the breast appears to be annihilated; moreover, the disease has

extended itself over a considerable portion of the chest and shoulder. Within the last few months much pain has been felt in the arm, which is greatly swollen from œdema, presenting the appearances usual on an aggravated and protracted scirrhous breast.

Affections of the Brain and Nerves are by no means numerous, (1 in 21,) nor present any very marked peculiarities. *Apoplexy* for the most part takes place in the robust and aged. It occurs so frequently on the boisterous changes of the equinox, as also on a cold north-easterly wind suddenly setting in upon previous mild weather, that I am induced to think atmospheric changes may be regarded as proximate causes of the attack. Though this may be somewhat referable to the electrical condition of the atmospere being changed, yet there can be no doubt, the altered nature of the climate interfering with free cutaneous perspiration materially assists in producing the internal congestion. From this greater liability to sudden death in cold weather, Mr. Farr is inclined to believe that many stated to die of apoplexy, really die asphyxiated from congestion of the lungs.*

Amongst the aged, paralytic attacks frequently take place without the least possible trace of apoplectic symptom. I have known several instances

* Letter to Registrar-general, p. 25.

in which complete and permanent hemiplegia has been suddenly induced without the loss of cerebral power for a moment.

Epilepsy. Many cases of this affection present themselves for treatment: some connected with catamenial derangement, some apparently with stomach disorder, while others are entirely idiopathic; all, during the attack, show evidence of turbulent action of the heart. The two former I have frequently found yield to remedies applicable to the primary affections; the latter, though more intractable, yet has in many instances been much benefited, and in some few entirely relieved, by a sustained exhibition of the valerian and hydrocyanic acid, together with the daily use of some slight tonic aperient and antacid, as rhubarb combined with soda. The effects of these remedies have been so striking in several instances, that I cannot but think them particularly valuable in this complaint.

Of Catelepsy I have had the opportunity of seeing but two cases; these however were very marked,—the one in a male, the other in a female. Chorea I am disposed to think but a rare affection; it usually occurs before the age of puberty. The exhibition of the carbonate of iron, together with a well-sustained but mild purgation, has appeared the most satisfactory treatment.

NEURALGIA OF THE NERVES OF THE BACK, or, as it is more generally styled, SPINAL IRRITATION. This affection is far from unusual; but as I have no means of comparing its occurrence here with other districts, I can say nothing with regard to its relative frequency. It occurs almost exclusively in females from the seventeenth to the thirtieth year, of excitable minds, whose natural feelings are controlled by circumstances, and usually in connexion with some uterine derangement, as dysmenorrhœa. The ordinary symptoms are, pain in the back part of the head, and in the chest, more especially at a point under the left mamma, often affecting the breathing; sometimes the pain extends over the abdomen; these variations in its seat mainly depend upon the classes of nerves affected, whether they be the cervical, intercostal, or lumbar; the diaphragm is often spasmodically contracted; the tongue usually coated by a thick slime; the eyes inclined to be staring; the pulse quick and small; occasional painful vomiting; and, more often than otherwise, a short constant cough, which materially adds to the distress of the patient. On examining these cases more particularly there will usually be found on one or both sides of the spine, more generally on the left, a tenderness on pressure, which is found to be over the intervertebral column, opposite to the exit, and along the course, of the spinal nerve; it is on these grounds that I regard them to be Neuralgia, and

not Spinal irritation; for if this latter were the source of the disease, the tenderness would probably be found at the origin of the nerve, and consequently at a point more or less elevated above the intervertebral foramen. In some of these cases I have found the spine very considerably curved, but the curvature is attended with this peculiarity, that it is not constant; in several I have even known the leaning sides changed, in very short intervals. These symptoms, heavy as they appear to be, may continue for months, nay, for years, and yet the patient does not lose flesh, on the contrary, without being fat, rather enjoys a state of *embonpoint*.

The treatment is too often most unsatisfactory; I have thought, however, that relief is frequently obtained from the adoption of quiet, blistering the points of nervous irritation, the occasional use of leeches, but not to the extent of materially depleting the constitution, and from the steady perseverance in purgatives combined with croton oil, or the tartarized antimony; the use of a combination of the oxyd of zinc and hyoscyamus has also appeared beneficial.

In these cases, after the pain has been removed, the mind very frequently retains the impression that all power of motion is lost; and, unless this be counteracted, it leads to the melancholy result of an hysterical paralysis.

Of HYDROPHOBIA one case, of TETANUS two, and of TRISMUS two, are all that I have seen of these affections. The symptoms of hydrophobia did not show themselves until six weeks after the bite of the dog; but after a few days' illness the disease proved fatal. The appearances on dissection were an inflamed condition of the mucous coats of the stomach. One case of tetanus occurred during the excessive heat of a very hot summer, and was seemingly caused by the irritating effects of mercury, taken to profuse salivation for a syphilitic attack; the patient died. The other was an accident, a nail having penetrated the sole of the foot; the patient also died. One case of trismus was caused by inanition after childbirth; the patient recovered by judicious feeding and the careful exhibition of stimulants and sedatives: the other occurred in consequence of extreme vexation, and, though alarming in its character, yet eventually did well; this patient stated that he had suffered an attack previously, which was caused by having had administered to him, in mistake, a large dose of hydrocyanic acid.

DELIRIUM TREMENS is very rare; only occasionally a case is met with. The lower orders are peculiarly free from it.

SUICIDE, comparatively speaking, is rare also. In the ten years there were but seventeen cases.

No particular mode of self-destruction appears to have been adopted.

In confirmation of the infrequency of suicide here, it may be mentioned that, in the Letter to the Registrar-general (page 6), it is stated the south-western counties are in this respect considerably below the average of England, amounting to but 5·3 per cent. The average for the whole of England is 6·3, and for London 10·9.

Diseases of the Heart and great Vessels present in their features nothing very remarkable; they occur in about the usual average. As previously mentioned, many of the affections of the heart are referable to metastasis from rheumatism.

Diseases of the Lungs. Seventeen per cent. of the whole diseases, or one in six, are complaints of the lungs. Of these a large proportion consists of simple inflammation of the bronchial vessels. The symptoms of this inflammation are usually those of a feverish cold, with coryza; generally speaking it is not obstinate, and yields to mild treatment, excepting in persons advanced in years. Chronic catarrh, amongst the lower orders, is by no means uncommon; while amongst the upper classes it is comparatively rare. Bronchitis for the most part prevails during the winter and spring months; it would seem that the frequent source of this

disease is exposure to cold in the damp which prevails at these seasons.

The amount in the number reported of these affections is greatly increased by its including the cases of INFLUENZA, which was epidemic three several times during the period of these reports. Whether influenza belongs to this head, or should have been arranged amongst fevers with local determinations, may be a question. Popular feeling would certainly place it amongst catarrhal affections; while perhaps some pathologists might be inclined to rank it as a specific fever. Be this as it may, it has raged here epidemically several times:—in the year 1831 to a considerable extent; in 1833 and 1834, many cases were met with; but in 1837 its occurrence was more especially marked by the numbers attacked, and the severity of its symptoms. This epidemic appeared to travel from east to west. It commenced in the second week of January, and continued during the following six weeks. In the first ten days occasional cases only occurred; but on the 18th, 19th, 20th, and 21st of this month, it was generally prevalent. The more usual symptoms were, *first* oppressive pains of the head, especially over the region of the frontal sinus; diffused muscular pains of the shoulders, loins, and legs; constant sneezing, early followed by a very copious flow of a thin acrid discharge, chiefly from the membrane of the nose. (The membrane of the eyes was not so greatly

affected as in the influenzas of 1831 and 1834.) *Secondly*, these symptoms were quickly followed by an overwhelming feeling of lassitude and prostration of strength, with, in many cases, a loss of all muscular power, together with great anxiety of the precordia, and agonizing fears of impending death; a sensation of painful rawness of the fauces and trachea, a voice hoarse and hollow; frequent short cough, for the most part dry; stricture and acute lancinating pains of the chest; by the stethoscope there were heard râles, sonorous and sibilous, and almost always in some portion or other of the thorax, generally the lower, well marked crepitation; tongue coated with a copious white mucus, excepting at the top and edges, where the papillæ were inflamed and elevated; bowels not confined, and easily acted on by aperients, in fact, there was rather a tendency to diarrhœa; appetite gone; occasional thirst; pulse, small and quick, but soft; paroxysm generally severe during the night. At this stage of the disease I was sensible of the existence of a peculiar and very characteristic odour which was exhaled from the lungs of those affected; though not able properly to describe it, I may state its general character to have been that of a sour musty smell. *Thirdly*, about the fifth or sixth day a mucous discharge from the nose came on, together with a muco-purulent expectoration on coughing. The various symptoms now gradually declined, leav-

ing the patients in a state of great general weakness, together with a peculiar aching feel and loss of power in the muscles of the leg. Such may be considered as a hasty sketch of the nature of the disease; it spared neither age, sex, occupation, nor condition of life; all appeared liable without any discrimination to its attack, though it was certainly both more severe and fatal in its consequences to children and old persons, especially if these latter were affected with pulmonary disease generally, or, in fact, chronic disease of any kind. Those children appeared to suffer the most severely who had laboured under hooping-cough, or the eruptive infantile fevers which had prevailed to a great extent during the preceding November and December. Relapses were not unusual; the symptoms however were modified and lost much of their specific character, though these second accessions of disease were sometimes very severe. Nor were persons who had suffered from the epidemic in previous years any way exempted; on the contrary, they appeared more susceptible of its influence. After an attack had subsided, convalescence, in those who were strong and healthy, was commonly quickly established; while in others, symptoms of general lassitude lasted for weeks or months; and even, in some cases, to the present day its effects have not been recovered from. Phthisis, in those predisposed to it, seemed in many cases to follow the

attack; in others it appeared to leave something like a chronic inflammation of the stomach; certainly many became dyspeptic, and found that various articles of diet which had been previously innocuous now produced such irritation as to preclude their further employment.

Much has been said with regard to the contagiousness of this disease; and though many facts came under my own observation which bear strongly in favour of such a view, yet, from the general prevalence of the epidemic, any such conclusion cannot be assumed.

With regard to its prevalence, and the consequent mortality, some notion may be entertained from the following facts. The number of persons admitted to the Dispensary in the months of January and February of 1836 was 236, while the number during the same months of 1837 was 339; of these, 223 were admitted for influenza, or attacked during the time they were patients. Thus showing an increase of admissions during the prevalence of this epidemic of 103 patients.

The registers of the two large burial-grounds of Exeter in January and February, 1836, gave the number buried as 125; while in the corresponding months of 1837 they amounted to 227, thus giving an increase of upwards of 100 deaths.

The mode of treatment which I found most applicable was the exhibition of the milder diaphoretics

and carminatives with diluent diet. Depleting and severe purging, excepting in very rare cases, were quite inapplicable.

Asthma, though occasionally, is yet rarely met with, excepting in old people, and then is so complicated with the more permanent sources of dyspnœa, as scarcely to deserve the name.

Croup is at times frequent; it appears usually epidemically, a long period often intervening between the occurrence of cases. 1825, 1827, and 1831, were years in which it was more particularly prevalent.

Laryngismus stridulus also occasionally occurs; the cases which I have had an opportunity of seeing have been invariably in children of parents highly scrofulous. The treatment, which has appeared to me the most satisfactory, has been during the spasm to dash cold water on the face and chest, and in the intervals to give soda and rhubarb in alterative doses.

Hooping-cough occurs only epidemically; though generally mild, yet at times it assumes a character of great severity. This was particularly the case towards the latter end of 1833 and the beginning of 1834. A large proportion of the children

so afflicted spat up blood in the efforts of coughing; some died during the attack; and many lingered on with organic affections of the chest, thus aroused into action.

CONSUMPTION forms a large proportion of the diseases of the chest in this district; it occurs in all its various forms, though, most usually, the cases are protracted and lingering.

Amongst the cases of phthisis, a few were instances of pure phthisis laryngea. In these no very marked symptoms of any affection of the lungs were observable; on examination after death, however, they were invariably found much impacted by tubercular deposit. A few cases have also occurred of phthisis, complicated with syphilis. In these the alternations of disease were quite remarkable: at times the chest complaint would appear to be entirely suppressed, while syphilis, in its various forms of periostitis and ulceration, was rapidly progressing; then, on these subsiding, the more fatal affection, would develope itself; eventually they died of consumption in which both the perspiration and expectoration were peculiarly offensive. Three cases of mental delusion, in connexion with consumption, and after free salivation by mercury, have occurred to my observation, with so much singular coincidence, that I am induced not only to refer to them

here, but to style them phthisis, complicated with mercurial irritation. In each the patients presented the usual character of the incipient stage of phthisis; but superadded to this was an impression that their whole system was impregnated with mercury, which in two cases had been taken for syphilitic affection, and in the third for an accidental attack of swelled testicle. So strongly rooted was this impression that they maintained they smelled it in their perspirations, tasted it in their saliva, were convinced it was in their secretions, and that to this, and this only, was attributable the unpleasantness of the symptoms they were labouring under. This state of things in each occurred until the symptoms of phthisis became fully developed, which was usually sudden; then the delusion subsided, and the patient went through the ordinary course of a very rapid decline.

Pneumonia is by no means frequent, unless complicated with other affections of the chest, and apparently consequent upon them. Gangrene of the substance of the lung is only occasionally met with. Pleuritis is more frequent, and I believe exists to a greater extent than is usually believed; I am led to this conclusion from often observing in *post-mortem* examinations adhesions of old standing, the origin of which has never been referred to by the

patient, nor expected from his general condition. Occasionally, though rarely, cases of empyema are met with.

DEBILITY. Under this head may be classed numerous cases presenting themselves for relief, which, though much inconvenienced by general ailment, are characterized by no very obvious disease. Generally speaking, these persons are strongly tainted with the tuberculous constitution, but are free from any direct development of tubercle itself. Their symptoms are usually a complication of mental and bodily inaptitude, and though not complaining of a state of stomach to which the term indigestion may be applied, yet this organ does not bear overloading, and evinces a condition of great general weakness. These cases are much benefited by acids and weak bitters.

DISEASES OF THE ABDOMEN form a considerable portion of the illness of the district. They amount, exclusively of worms and diabetes, to 14¼ per cent. of the whole.

DYSENTERY may be said to be a disease not proper to this district: cases are only met with towards the close of a hot season, and then but very seldom. In August and September of 1825, and also in 1831, a few persons were attacked. At each

of these times it was epidemic, but not very widely prevailing. The cases were ushered in by fever, were very painful and obstinate, but usually did well. As far as I am aware chronic dysentery never supervened as a consequence. The treatment which was adopted, and with the most perfect success, was the exhibition of blue pill and opium, together with a purging mixture of castor-oil and tincture of henbane.

Diarrhœa is a very prevailing disease, especially amongst children. Its character is usually either the bilious or mucous, and requires the ordinary treatment recommended in these forms. In children it is sometimes very obstinate, and appears determinately to resist the more common remedies. During the autumnal months diarrhœa often passes into English cholera, though rarely until after the stone fruits are fully ripened. In 1828 it prevailed to a great extent; in fact, was a very wide-spreading and fatal epidemic; it commenced by a purging, immediately succeeded by vomiting; the evacuations were forcibly expelled, and without any exertion on the part of the patient. During this first period of the epidemic severe griping pains were felt, then general depression, weak pulse, and all the symptoms of collapse, cramps in the legs, sunken countenance, thirst, together with a continuance of the vomiting and alvine discharges—these to such an extent as to

be really most remarkable. If these symptoms were not capable of being controlled, about the third or fourth day the patients most usually succumbed to the disease. The treatment, which appeared to be followed by the most satisfactory results, was in some cases the exhibition of effervescing saline draughts, with blue pill and opium; in others, lime-water and milk.

The great visitation of Asiatic cholera took place in 1832. The first case that occurred was on the 19th of July. It was at that time prevailing both in London and Plymouth; and it is not a little remarkable, that this first case was in the person of a man who had in the previous twenty-four hours travelled from London; while the second case, which occurred on the following day (the 20th), in a totally different part of the town, was in the person of a female who had come three days previously from Plymouth. On the third day the disease showed itself at very widely different points, and, before four days were completed, it was a general epidemic.

At the first blush of this statement, it would appear, that a strong inference might be drawn from it in favour of the contagiousness of this disease. I am inclined to think however that the occurrence of these cases is open to different explanations. Both these persons may have been affected with the peculiar poison of cholera previously to setting out upon

their journeys, and on coming into a district in which the epidemic poison was commencing to exert its influence, may have been liable to the full development of its power earlier than those living quietly within the district; or they may even not have been infected previously, yet may have been rendered more susceptible by coming into the midst of it while under the debilitating influence of travelling. As an argument against its contagiousness, it may be mentioned that several neighbouring towns, with which the communication was most frequent and unrestricted, escaped, comparatively speaking, from its attacks. We may specify Topsham, four miles and a half from Exeter, Crediton eight miles, and Dawlish twelve. In these towns one or two cases only occurred.

The history of its occurrence here was much the same as described elsewhere. The symptoms differed in no respect from what had been observed in other localities. The treatment was various and attended by the same results—that is to say, on its first occurrence it baffled all attempts at cure, while latterly every one thought that in their own mode of practice they had found a specific. This was so strongly marked here, that, to me, it fully explains why one *methodus curandi* has been so confidently lauded, and the most satisfactory results assumed from it, but which has been found by those who may have tested it in some distant place to have been as

dishearteningly inefficient. In fact, the nature of the disease was very different on its first breaking out to what it subsequently became; it was at first characterized by the most intense and fatal virulence, while latterly it assumed so mild a form, as even in many cases to be recovered from without the aid of medicine.

In Exeter the Asiatic cholera continued very fatal for the first three weeks, and then gradually subsided: as an epidemic it may be said to have ceased by the 1st of September. During its continuance more than four hundred of the inhabitants fell victims to its ravages. In the following year (1833), during September and October, it again occurred, but by no means to the same extent. As a remarkable fact, it may be mentioned, that a great number of lunatics were attacked during this second slighter epidemic, a class of persons who had not particularly suffered in the previously more severe visitation. As far as I am aware no examinations after death were made.

GASTRITIS in its acute form seldom occurs; as a chronic disease it is more frequent. It presents nothing remarkable in its character.

PERITONITIS in 1827 was very frequent, in common with other acute inflammations of the serous membranes; it called for the most prompt treatment,

and bore with singularly good effect large bleedings, both local and general; in fact, abstraction of blood, together with the administration of calomel and opium, appeared the only remedies to be relied on. Since the above period, however, it has been comparatively rare, unless when occurring in the puerperal state. As an illustration of family predisposition, the following may be cursorily alluded to: In company with my friend, Mr Webb, I visited a young man in 1833, who was labouring under peritonitis; after an illness of ten days he died. A *post mortem* examination exhibited the peritoneum in a state of high inflammation, covered with a copious effusion of puriform lymph, by which the folds of the intestines were agglutinated together. Two years subsequently I visited a brother of the former, under similar circumstances. On the *post mortem* examination, so like were the appearances that a drawing of the one would most accurately have described the appearances noticed in the other. We were also given to understand that in a different part of the county another brother had died only a few months previously with much the same symptoms; no *post mortem* examination was made. Each of these cases of peritonitis occurred at a time when the disease was by no means prevalent, so that they must be entirely attributed to family predisposition.

The LEAD, or as it has been called, the DEVON-

SHIRE COLIC, is now no longer frequent, excepting in painters and those who may accidentally be subjected to the influence of lead. Since the time Sir George Baker showed that the prevalence of this disease in Devonshire was owing to the employment of leaden vessels in the process of making cider, which was then the custom throughout the county, these have been abandoned, and, with the cause, the disease has subsided. Devonshire now no longer particularly deserves to give its name to this affection of the bowels.

DYSPEPSIA prevails to a considerable extent. Bad diet and the anxiety of mind consequent upon poverty, are prolific sources of this affection amongst the poor. It appears often referable to deficiency in clothing, especially during the night; to the free indulgence in cider; to the quantity of hot drinks, in the shape of weak broths, tea, &c., which they consume, and by which the tone of the stomach generally is materially impaired. In the lower orders the want of a proper diet is as injurious as the abuse of abundance amongst their wealthier neighbours. The form which it usually assumes is that of a gnawing pain in the region of the stomach, palpitation of the heart, and the eructation of flatus, and occasionally of a small quantity of acrid fluid; the more copious flow of gastrorrhœa is less frequent. The treatment which I have generally found most

useful has been the exhibition of mild tonics, as the trisnitrate of bismuth with soda, combined with a little rhubarb; and if the pain be excessive, the addition of two grains or so of Dover's powder; at other times, the bitter infusions, with soda, the nitrate of silver, or lime-water, have been serviceable. However beneficial these medicines may be, yet in too many cases an ill-regulated and insufficient diet prevents satisfactory recovery.

The seasons of the year in which dyspepsia prevails to the greatest extent are spring and summer; by far the largest proportion of cases takes place in the month of May. Generally speaking, the persons affected are about the meridian of life; forty-one being the average age. Females appear to suffer in a much larger proportion than males.

We usually refer dyspepsia to a disordered condition of the functions of the stomach, or to disease in the organ itself, and, to a great extent, such views appear to be correct; but at the same time I am inclined to think that affections, both functional and local, in the pancreas, are sources of this distressing complaint. It is remarkable how little the disorders of this viscus are recognized; and yet what an important part it performs in the phenomena of digestion.

Cases of pure gastrorrhœa are now and then met with. In some the quantity of fluid voided is immense; these cases have generally occurred in

females in whom there was some considerable and very prominent uterine irritation. The medicines giving greatest relief are saline draughts in effervescence with an excess of alkali, the liberal and long continued use of *James's* powder, and sometimes sedatives. Acids or the astringent bitters rarely seem serviceable, on the contrary, rather appear to aggravate the symptoms.

Of those rare affections, apparently very intimately connected with the dyspeptic state, in which a copious discharge of an oily fluid is passed from the bowels, mingled with the alvine excretions, a few cases have occurred. The matter referred to is like oil when passed, but quickly concretes into a solid semi-transparent waxy-looking mass; soft, yielding easily to the pressure of the finger, having, in fact, much the consistence of simple ointment; feculent in smell; apparently not changed by keeping; gives a greasy stain to paper, which is not discharged by heat; with litmus, gives rather an alkaline reagency; on heat being applied, first liquefies, then passes off in white smoke, leaving a red viscid fluid; does not ignite on a lighted match being applied to it, but the match burns brighter if moistened with it; with liquor potassæ forms a soapy, but not an homogeneous mass; not apparently acted on by nitric acid; sinks in alcohol, at the bottom of which, if heat be applied, a globule of amber yellow fluid forms; this, on cooling, again

becomes solid, and to all appearance unaltered by the spirit, yet, if the supernatant alcohol be decanted and set aside, a slight opaque matter rises to the surface, and if water be added, the alcohol becomes opalescent, and deposits a white precipitate, which does not crystallize. We may therefore conclude that, though this matter in some of its relations approaches to fat, it cannot be considered identical with it.

STRICTURE OF THE ŒSOPHAGUS is sometimes, though not often, met with; in 1833 several cases occurred. In two, which I had the opportunity of examining after death, the disease appeared to consist of an hypertrophy of the submucous tissue, consequent upon inflammation: its origin in both was referred to attacks of influenza in 1831.

Aphthous sores of the mouth and tongue are by no means infrequent,—most often in complication with other diseases, though sometimes they occur idiopathically; in either case they are very troublesome. They usually commence in a small vesicle, which, breaking, permits the exudation of a little fluid. After this there is left an abraded surface, which, if not attended to, becomes an ulcer, usually as obstinate as it is painful. The old remedy of borax and honey is very serviceable before the ulcered surface is established; after that it appears of no use. The ulcers are most easily cured by a

weak solution of lunar caustic, or, what is even better, a weak ointment of the nitric oxide of mercury. At the same time that this local treatment is adopted, the exhibition of a solution of Epsom salts in the compound infusion of roses is given with advantage.

DISEASES OF THE LIVER. Bilious diarrhœa and the slighter functional disorders of this viscus are certainly not infrequent; but what is generally understood by the term "liver disease" is by no means common. Occasionally cases of chronic affection, jaundice, &c., present themselves, but acute inflammation is very rare, as is also the formation of gall-stones. Derangement in this organ is, I believe, often excited by the too indiscriminate use of mercury; especially in the little illnesses of children:—this medicine is frequently given to such an extent that the liver becomes over-excited, and consequently pours out vitiated secretions, which are then produced as evidence of disordered liver, and therefore of the further necessity of its exhibition. It is also often used to an equally erroneous extent, in cases of decided organic disease of this viscus; under such circumstances it is too exciting, and rather injurious than otherwise. Its employment appears more suitable in functional disease.

It may not be inapposite to mention a case which appears to me of much interest. A. B. had long been jaundiced; suffered pain on the right side on

pressure, where was evidently a fulness and hardness. He occasionally experienced all the symptoms of the passing of gall stones, a few days after which, small dark-coloured matters, not unlike caraway seeds, were found mingled with the fæces. On the examination after death the gall-bladder was seen involved in a mass of scirrhus; the common biliary duct was scarcely pervious enough to admit an ordinary-sized pin; the liver itself was large and hard, gorged with bile, and here and there could be picked out the small caraway-seed-looking particles. These were, without doubt, moulds of the secreting surface of the liver, and apparently consisted of inspissated bile. They are evidently entitled to be called "calculi of the liver." They are about the tenth of an inch in length, and one sixteenth in width, slightly curved, and kidney-shaped, very light, ten weighing only one grain; their surfaces are covered over with ridge-like reticulations. I am not aware that any such matters have been previously described.

Diseases of the Urinary Organs are not very frequent, excepting towards the latter periods of life, when chronic diseases of the bladder, urethra, &c., are by no means uncommon. During the middle period of life the affections of the urinary system consist for the most part of inflammatory disorders of the kidney, giving rise to albuminous

urine, and functional disease characterized by an undue secretion of lithic acid, deposited in the form both of an amorphous sediment and gravel; this latter sometimes proves sufficiently obstinate and inconvenient in patients of lax fibre and broken-down constitution. The triple phosphate is also not an unusual deposit. These affections appear to be far more frequent on the new red sandstone district than on that of the schist; at least, the greater proportion of cases I have had an opportunity of seeing have been in persons inhabiting the former.

Calculus of the bladder is an affection comparatively rare.

Uterine Diseases occur in nearly the average proportions, forming about 4 per cent. of the whole number of cases, or 1 in 24. The months of April, May, June, July, and August, are those in which affections of this system occur the most frequently. They consist chiefly of chlorosis and amenorrhœa, and menorrhagia and fluor albus; these latter are chiefly prevalent about the age of thirty and upwards, while the former are more usually the disorders of twenty-five and under. Dysmenorrhœa is by no means infrequent, but is usually complicated with the others, though sometimes it appears as an idiopathic affection.

Hysteria, Proteus like, assumes here its various anomalous forms, and is equally troublesome of cure

as in other places. A very deceiving and tedious affection of this nature, of which many cases present themselves, is a complication with pectoral irritation. It is characterized by an almost incessant dry hacking cough, which no medicines, administered directly for its allaying, appear capable of subduing. The pulse is quick, the skin dry, the countenance anxious, the nights sleepless. The uterine condition usually attendant on this state is that of menorrhagia; though cases occur with the opposite condition of an amenorrhœa. This state of things will continue sometimes for years in spite of every endeavour to relieve it; it is however considerably alleviated and sometimes cured by the exhibition of the warm gums and tonics, as myrrh, iron, acids, &c. Opiates have never appeared to me to give the least relief.

Puerperal Fever, comparatively speaking, is not a common disease. In 1825 and in 1830 it somewhat prevailed; latterly, however, an occasional case only has occurred. In August, 1841, a few cases were met with, but they were confined to a very small district of the city.

Bronchocele. Cases of this disease now and then offer themselves for observation. The character of the tumour is rarely hard and fleshy, but usually soft, with evident fluctuation, especially if it have

amounted to any size. I have most frequently found it ameliorated, if not entirely cured, by the repeated application of leeches and the internal administration of iodine. It usually occurs in the leuco-phlegmatic constitution. Amongst the cases recorded, one only is a male.

WORMS are a common disorder, though not so according to the Dispensary reports. This is easily accounted for: the poor only apply for relief if the concomitant symptoms become urgent. The lumbrici and ascarides are the most frequent varieties. Amongst ill-fed adults the short-jointed tape worm is a common entozoon. Against this last, I have found the bark of the root of the pomegranate particularly serviceable. The formula I am in the habit of recommending is the following: ℞ *Cort. radicis punicæ granati* ℥ij, *aquæ* lbij., *macera per horas* xxiv., *decoque ad* lbj., *adde syrupi zingiberis* ℥j. Two ounces of this to be taken every half hour until the worm is expelled. If the head become dizzy, which is not unfrequent after the fourth or fifth dose, it should be discontinued. It is quite necessary that the above should be made of the bark of the root, and not of the rind of the fruit; this latter appears to be totally inert as a vermifuge.

ERUPTIVE DISEASES form a considerable proportion of the disorder of this district, amounting to

one seventh of the whole, or 1 in 14. The most commonly met with are scabies, herpes, impetigo, psoriasis, lepra, eczema, prurigo, and acne.

Surgical Affections, it will be seen by the tables, comprise a large proportion of the cases admitted: one fourth of the whole. They consist of the usual affections of this nature; perhaps there may be a larger proportion of bad legs than is common to other parts of the kingdom, from the practice of "kicking shins," adopted in the mode of wrestling in this county: with this slight remark this branch of the subject is dismissed, as not coming particularly under my observation.

I shall conclude this sketch of the diseases of the district, by quoting a table from Mr. Farr's Letter to the Registrar-general, in which the deaths that took place in Devonshire in 1839 are arranged under twelve classes of causes, and by which their relative proportions per cent. may be observed, placing in apposition a similar table of the causes of death during the same period for the whole of England and Wales.

On comparing these tables the more prominent facts are, a less average of deaths in this district from epidemic, endemic, and contagious diseases, though typhus fever is rather in excess. Diseases of the nervous system appear to be a much less frequent source of death than in England generally, as is also

the case with uterine affections. The amount of death from the urinary organs in males, from diseases of uncertain seat, and from old age, as also from the diseases of the respiratory organs, including phthisis, are considerably in excess of the general average; doubtless the proportion of deaths from the latter cause is greatly increased by the accidental circumstance of numbers of strangers afflicted by this disease dying in the county.

	Classes of Diseases.	Total for England & Wales		Total for Devonshire	
		Males	Females	Males	Females
1	Epidemic, Endemic, and Contagious Diseases	19·368	20·189	14·773	15·729
	Including Smallpox	2·866	2·655	1·623	1·275
	Including Typhus	4·541	4·947	5·054	5·623
2	Diseases of the Nervous System	16·012	13·727	13·720	12·292
3	Diseases of the Respiratory Organs	27·039	27·780	29·523	27·317
	Including Phthisis	16·698	19·394	18 179	18·393
4	Diseases of the Organs of Circulation	1·261	1·028	1·140	·956
5	Diseases of the Digestive Organs	6·361	6·203	6·449	5·258
6	Diseases of the Urinary Organs	·758	·160	1·189	·182
7	Diseases of the Organs of Generation	·023	2·080	·024	1·548
8	Diseases of the Organs of Locomotion	·652	·569	·800	·319
9	Diseases of the Integumentary System	·174	·096	·274	·091
10	Of uncertain seat	13·822	14·242	15·298	17·596
11	Old age	9·428	11·835	11·138	16·208
12	Deaths by violence	5·102	2·091	5·672	2·504

Chapter III.

THE CLIMATE OF THE SOUTH OF DEVON CONSIDERED IN REFERENCE TO ITS EFFECTS ON HEALTH AND DISEASE.

Having in previous pages described the actual state of the climate of the South of Devon, I shall now direct some few observations to its effects on persons visiting it in the pursuit of health. Those coming from colder climates are early sensible of some of its chief characteristics, more especially of that warm softness, which produces a general tendency to relaxation;* they will probably express themselves as labouring under an unusual lassitude of mind and body, a feeling of fatigue, and a greater inclination to sleep than usual, in fact, they actually require more repose; the functions of the skin become more active; the liver is disposed to secrete more freely; the discharge from the kidneys is rather lessened, as also the exhalation from the mucous

* The public singers who visit this district invariably complain of difficulty in producing the higher notes.

surface of the lungs ; and the respiration is diminished in frequency.

To those who have lived for any considerable time in the East or West Indies, a residence in this district is serviceable, whether it be regarded in a prophylactic or curative point of view. From the peculiar power of this climate in sustaining free cutaneous perspiration, and from its not exciting any inordinate action of the functions of the liver, it tends to prevent the disposition to general and local congestion, so much suffered from by those returning from the warmer latitudes.

The ordinary physiological effects of this climate upon the constitution, show why benefit is likely to be derived from a change to it, in cases of disorder of the chest generally, but more especially in that irritable state of the lungs, which precedes the development of consumption ; in inflammatory bronchitic affections ; in scrofula generally, as also in some forms of dyspepsia.

The diseased conditions to which it appears inapplicable, are, fulness of the head ; any tendency to derangements of the great blood-vessels ; a relaxed state of the uterine system, as evinced in menorrhagia, &c.

We shall now proceed to speak more particularly of the disordered conditions of the animal economy,

in which a change to the climate of the South of Devon appears beneficial.

At various periods of life the system undergoes changes, which, though not actually referable to disease, are yet so weakening and depressing in their character, as to give cause for considerable anxiety. I allude to the weaknesses in early youth attendant upon an undue growth; to that peculiar state about the conclusion of the middle period of life which has been termed climacteric disease; and, to the general failing of more advanced years. In these cases a change to this climate often appears to be highly advantageous.

The symptoms of constitutional disorder, attendant upon this state of weakness in early life, are a pallid appearance, loss of appetite, sometimes slight pain about the cardiac region, tongue slightly furred, pulse small and accelerated, together with a general tendency to febrile accessions. These cases frequently pass into a state bordering upon fever of a remittent type. There can be no doubt that an attention to this lesser state of derangement is of paramount importance, for, if neglected, it not unfrequently paves the way for the development of serious disease; scrofula, and the more obstinate forms of dyspepsia, often following in its wake.

The next period of life in which a change to this mild district appears particularly beneficial, is that

marked by the commencement of decay, to which the term climacteric has been applied. In a short, but very elegant essay, Sir Henry Halford* views it as a disease rather than a mere declension of strength, and natural decay of the bodily powers. It is particularly marked by an extraordinary alteration in the expression of the countenance, by a falling away of flesh without any obvious source of exhaustion, and by a quicker pulse than natural. Sometimes it comes on so gradually and insensibly that the patient is hardly aware of its commencement. He perceives that he is sooner tired than usual, and that he is thinner than he was, but yet he has nothing material to complain of. In process of time his appetite becomes seriously impaired; his nights are sleepless, or, if he gets sleep, he is not refreshed by it; his face becomes visibly extenuated, or perhaps acquires a bloated look; his tongue is white, and he suspects that he has a fever. The period of the occurrence of this disorder is irregular, every age between fifty and seventy-five being liable to it.

In these cases a residence here is often early marked by the recovery of appetite and strength, and, to a certain extent, the regaining of flesh; and ere long, an improvement in general appearance, and a restoration of constitutional power, prove that the system is surmounting its failing tendency.

* Essays and Orations, p. 5.

Scrofula. It is generally understood that the existence of scrofula is due to the deposit of tubercle in some one of the organs of the body. To those predisposed to its development this climate is eminently beneficial; it may therefore not be inappropriate to point out the state of the system which indicates a tendency to it. We shall first speak of scrofula in general, then of that particular form of it, known under the term consumption.

The peculiar susceptibility to scrofula is often thought to belong to particular temperaments and complexions; such however does not appear to be the case; nevertheless certain characteristics do exist, by which an inherent predisposition to the disease is indicated, and it follows, that as scrofula consists essentially in the formation, and presence in the various tissues, of tuberculous matter, any condition of the system which, under certain exciting causes, is prone to its development, may justly be termed a scrofulous diathesis. This condition we shall now endeavour to describe; before doing so, however, it is necessary to premise, that its characters are progressive, and that they are generally more pronounced if of hereditary origin, than when acquired in after-life.

The general form is frequently deficient in proportion and symmetry; the head being relatively larger than the trunk, the abdomen prominent, and the limbs small, with large rounded joints. The skin

usually opaque, becomes sallow in the dark-complexioned, while in the fair it assumes an appearance not unlike blanched wax; to the feel it is soft and flaccid, and presents but little elastic resistance to the touch, giving the impression, when pinched, of being thinner than is usual in persons of a healthy constitution, it is indeed owing to its really being very thin in texture, that the veins are seen ramifying beneath it; it rapidly shrinks away under privation, fatigue, or disease, but the effect of these being recovered from, its previous state of fulness is as quickly restored; this is owing to a deficiency in what has been termed stamina, or enduring tone. When this constitution is more marked, the skin becomes coarse and dingy, generally dry and harsh, (excepting in the palm of the hand, which is bedewed with an unhealthy cold moisture), and very subject to various eruptions of a scaly or furfuraceous nature; the hair, especially in the morning, feels rough and dry, and looks as if undressed; the countenance is doughy, the cheeks are full and rounded; the upper lip and nose swollen; the eye large, with a very open pupil; the eyelashes, unless destroyed by conjunctival inflammation, long and handsome. The powers of the body are very inadequate to the apparent strength of the mould in which it is cast; the circulation is generally feeble, as is indicated by a weak pulse and cold extremities. This state of the circulating system forms an element

in the tuberculous constitution;* it is rarely found wanting, and may be regarded as affording an explanation of many of the phenomena of the disease. The digestion is much enfeebled; the bowels become irregular, for the most part torpid, and the evacuations, especially in infancy, are not healthy; the urine is scanty, turbid, and ammoniacal; the cutaneous secretions are very irregular, sometimes suppressed, at other times excessive; their character is also diseased, being occasionally more or less fetid, and usually leaving a reddish stain on linen, if worn many days. The nervous system is characterized by an exaggeration of its natural bias; the irritability or apathy of the constitution, as the case may be, becoming more marked. Protracted and frequent sleep is ordinarily much indulged in, and after slight exertion is profound in the extreme.

Change to this climate is particularly serviceable to persons of this constitution as a preventive; it is however rarely sought for until some disorder of the general health indicates that the first and incipient stage of the disease is about to develope itself in its characteristic tubercular deposit. The consideration of this very important period has been much neglected; in its description should be included many symptoms which have hitherto been identified, though incorrectly, with the scrofulous diathesis.

* Clark on Consumption and Scrofula, p. 15.

The countenance, to the casual observer, presents the appearance of good health; a more accurate examination, however, betrays this appearance to be illusive: after very slight exertion it presents a haggard and worn expression alike indicative of mental distress and bodily fatigue; and at times the cheeks assume a hectic flush, which adds to the brightness of an evidently excited eye. As this stage advances, the countenance loses its fallacious appearance, and assumes a hollow and jaded character. This is very marked if the complexion be sallow, as it becomes dull, untransparent and doughy; the lips are pale; the last joint of the fingers swollen and rounded, instead of tapering, and the nails squared and bent forwards, presenting that appearance which is termed clubbed.

During this incipient stage of the disease, there is great liability to colds and slight feverishness; the most trivial causes excite inflammatory action in the mucous membranes, during which all the other symptoms are aggravated. The patient complains of frequent faint perspirations, alternating with a dry feverish state of the skin, the cold clammy extremities are very liable to chilblains; the mucous membrane of the nose to irritation, accompanied by a thin acrid sanguineous discharge, which excoriates the external surface; the swollen alæ and septum, preventing the free passage of the air, oblige respiration in great measure to be carried on through the

half-open mouth, which thus becomes a characteristic feature of the disease; the upper lip participates in the swelling, and now is seen the chap in the middle of it,—a symptom of the disease itself, and not of the diathesis only, as is usually stated to be the case. The inner membrane of the eyelid is often irritable and inflamed, and the eyelashes, generally so long and beautiful, drop off, and leave the eye unprotected. This stage, in short, presents all those appearances that might be expected in a subacute state of inflammation of the mucous membranes. On its accession there is, in those of a sanguineous temperament, an exaltation of the mental powers; the perceptions are quickened, and the expressions lively and brilliant; while in persons of a cold and phlegmatic constitution, there is an increased dulness, and a more marked tendency to lethargy and inaction; the temper for the most part is placid, quiet, and relying, though sometimes, especially in those of a bilious temperament, desponding and perverse; the nervous system participates in the morbid changes, and exhibits more susceptibility than natural; the sleep is disturbed with dreams, and not unfrequently attended by weakening perspirations of an offensive character. The patient during this stage, though generally complaining and unwell, feels no one symptom of paramount importance, and scarcely knows how to describe his sensations.

To such persons, especially if there be any heredi-

tary liability, the climate of this portion of Devon often proves most beneficial. It must however be sufficiently obvious that, besides climatorial change, other points should be attended to, and as they are of importance, a few observations may be directed to them.

In a child born of strumous parents, every means should be taken as regards food, air, clothing, &c., to strengthen the general health and to counteract the hereditary tendency. During infancy, should the father alone be scrofulous, and the mother in every way a proper person to nurse her own offspring, nourishment should by all means be derived from her in preference to a stranger. If, however, the error of constitution be in the mother, a young healthy nurse should be substituted, and, for the first six or seven months, the infant entirely nourished from the milk so afforded; in the succeeding three or four months other food may be resorted to, in addition to that of the breast. A small quantity of the clouted cream, proper to this county,* added to the boiled biscuit-powder is very useful for this purpose; it forms a light and nutricious compound, and is often found to agree with delicate children when almost all other kinds of food prove to be inappropriate. About the age of ten months, or at least twelve, the infant should be

* Vide postea.

weaned: nothing conduces so much to produce a feeble frame of body as protracting the period of nursing; the milk becoming poor and innutricious, and causing flatulence and indigestion.

The clothing of infants is of great importance, as they neither have the temperature of adult age, nor enjoy the power of generating heat to the same extent. Cold operates much more generally than is supposed, and often seriously injures the constitution, even when its effects are not manifested by any immediate sensations. At the same time that it is necessary to watch the changes of the seasons, and to guard against their injurious effects, it is also of consequence to promote that state of the system which is favorable to the generation of animal heat, in order to compensate for the abstraction of it by radiation, the temperature of our climate always making this a condition of our existence. This is effected by maintaining the organs of respiration and circulation in a state of vigour, by exercise in the open air, living in well-ventilated apartments, and by keeping up a healthy condition of the surface of the body. The importance of fresh air cannot be too strongly inculcated; the rooms occupied by those of a strumous tendency should be large, airy, and not over inhabited; and above all things the infant should not be confined in a cot or bed surrounded by curtains. The child of a country labourer, with everything against him except that he

enjoys fresh air, exhibits a vigour of health and appearance that is in vain looked for in those nurtured in the confined atmosphere of the nursery. Fresh air gives tone to the skin, vigour to the respiration, and conduces, in great measure, to a healthy state of the digestive organs.

As the infant advances to childhood, the same general rules should be followed. New faculties however come into play, whose progress should be watched with the most zealous care. The development and management of the mind requires a constant surveillance. Nothing can be more injurious than the forced system of education which prevails in the present day; the head is developed at the expense of the body, and a child thus brought up presents the appearance of a weakly frame with a precocious intellect, which, as manhood advances, fades into weakness and irresolution. A child with a scrofulous diathesis, should learn its lessons in the fields, and not be bound down to books in the crowded atmosphere of a school-room. Amongst boys there is some relief and antidote in the hours of exercise, and free enjoyment both of body and mind: the whole period however of female school education is too generally fraught with conditions the most obnoxious to the strumous constitution; their rooms are often confined and ill-ventilated; the use of stays, bands, and strings prevents the free exercise of the muscles; in school and out of school, it is one

system of drilling and exhausting attention, either to mental or external qualifications; and the natural positions of the body, which are occasionally assumed to relieve the consequent fatigue are reproved as unseemly and unlady-like; then again the course of study is so copious and extensive that the energies of the mind are weaknened by a succession of ever-varying impressions.

Another point to be particularly attended to is the state of the moral feelings; should they naturally be excitable, control must be exercised, but of that quiet and unsuspecting kind, not calculated to irritate or wound: on the other hand, should they be of a morose or apathetic nature, means should be taken to excite cheerfulness and activity. Children at an early age are much more susceptible of moral impressions than is generally supposed.

Consumption. This district possesses many of the qualifications which are usually thought requisite for counteracting the consumptive tendency, such as, its contiguity to the sea; its protective amphitheatre of hills, forming an adequate barrier against the north and east winds; together with an atmosphere, soft, warm, and charged with aqueous vapour, a condition eminently useful towards alleviating irritation of the lungs. The spring, from the occasional prevalence of easterly winds, is the only season which is trying to the consumptive constitution; nevertheless, I very

much doubt whether, even then, this district is not more suitable than most other parts of England.

In order to estimate the probable benefit to be derived from a change to this climate, we shall analyze its effect in different stages of this disease.

1st. Before and at the commencement of the deposit of tubercle in the lung.

2d. During the conversion of the tubercle into yellow matter, but anterior to the

3d Stage, when softening of the tubercle and suppuration have taken place.

In general terms it may be stated that, in the first stage, a removal to climates of this mild character often proves curative ; that, in the second, the disease may not only be retarded, but, frequently, the health become so far re-established by the change, as to prevent the further development of tubercle ; in the third and last stage its utility is very equivocal, unless the disease assume a chronic form, then, to a certain extent, it may be serviceable.

The condition of the system preceding tubercular development in the lung has been minutely described by Sir James Clark, who terms it the tubercular cachexy. In speaking of scrofula its chief characteristics have been mentioned; we shall therefore proceed briefly to notice that stage of the disease in which tubercle, though it have been deposited, is yet unaccompanied by any very active tendency. From a careful examination of a large number of

cases, this stage has appeared to me to be characterized by slight febrile action; great disposition to perspirations in bed, and on the slightest exertion; general feeling of weakness and exhaustion; small and quick pulse; anxious, and easily excited manner; occasional cough, which is dry, or nearly so, and sometimes so slight as scarcely to arouse the patient's attention; from this cough being accompanied by some slight symptoms of indigestion, and by no very prominently-marked chest affection, it is often unfortunately attributed to mere disorder of the stomach, and upon this presumption the danger consequent upon its continuance is disregarded; stitch is frequently felt in the side, as well as fleeting pains in the integuments, not unlike those of rheumatism; sometimes a constant pain is referred to the centre and lower portion of the sternum; the breathing is usually short and hurried, and a general tendency to bronchitic attacks is evinced. On further investigation it is frequently found that a small quantity of blood, a mere speck or streak, is expectorated with the mucus: a seemingly unimportant symptom, but which should always be viewed with the most anxious alarm. The *stethoscopic* signs are a general sound pervading the chest, resembling, to a certain extent, the noise heard on putting a small shell to the ear; (this confused sound takes the place of the vesicular murmur, and is, as I conceive, due to a state of hyperemia, causing greater resonance in the

bronchial tubes, so that the inspiratory murmur is prolonged into, and confounded with, the expiratory, which is itself increased in intensity); distinct sonorous bronchial respiration during and after cough, giving the idea of the chest opening widely; a dry ronchus towards the apex of the chest, if tubercle have formed even in the smallest quantity; the voice sounding deep and dull, reverberating immediately beneath the stethoscope, but not so strongly as to be called a bronchophony. On percussion the sound is not strikingly affected, though sometimes accurate examination may detect a slight dulness, as well as some diminution in the freedom of motion under one or both clavicles: so frequently have I seen this state of things, not only in those most certainly predisposed to tubercular development, but where it has been followed by the disease itself, that I no longer hesitate to view such collection of symptoms as the early but *curable* stage of consumption, and consequently deem it worthy of every attention.

In this stage of the disease the effects of the Devonshire climate, on those coming from less temperate districts, are often very marked; the general tendency to weakness and irritability of the system is quickly subdued, the pulse becomes less frequent, and this general amelioration of the symptoms appears followed by a complete restoration to health. The medical treatment usually pursued at the same

time, has been the constant exhibition of Lugol's solution of iodine, the free application of mustard poultices to the chest, and the occasional use of digitalis, diluted sulphuricacid, superacetate of lead, belladonna, hyoscyamus, soothing cough medicines, &c., as occasion may require. Under the action of the iodine it is remarkable how quickly the pulse is brought down, *without* being depressed, the patient at the same time gaining rapidly in flesh.

When the disease has fully arrived at its second stage, cure is, I believe, entirely out of the question; nevertheless the symptoms may be alleviated; the disease kept in abeyance and life prolonged. By a residence in this climate the pulse becomes stronger and less quick, the expectoration lessened, the evening fever and its subsequent night perspiration diminished, and the patient, to a certain extent, recovers his former strength.

In the third stage, when the disease has become fully confirmed, and there is every evidence of the tissue of the lung, being seriously and *actively* affected, any view of ultimate recovery is utterly hopeless: unless there be some peculiar and obvious necessity, a removal is not only cruel and fatiguing to the patient, but delusive to the hopes of the friends. It is from such injudicious practice that discredit has been thrown upon the really useful effects of climate, when applied in proper time.

Occasionally, however, consumption assumes,

even after suppuration has taken place, somewhat of a chronic form, probably owing to a small portion of the lung only being affected; this is usually in persons about or passed the meridian of life. They invariably suffer from cold bracing climates, and may therefore pass their time more comfortably to themselves in this district.

Bronchitic Affections. Nearly all the diseases which affect the mucous membrane of the trachea and bronchial tubes generally, are benefited by soft mild weather, it is therefore no more than might be anticipated to find the climate of Devon serviceable to them; this is particularly the case in the common bronchitis, which constitutes the great amount of winter cough suffered from in this country.

Bronchitis often assumes a chronic form, and then becomes peculiarly distressing. The prominent symptom in the young and middle-aged is, a frequent cough, which, if not accompanied by copious expectoration of a mucous or muco-puriform character, is attended by urgent febrile derangement, and painful constriction of the chest. Under the more favorable circumstances the pulse is somewhat frequent, and the tongue slightly furred, indicating a small amount of fever; but when the cough is troublesome, pain in the head, as likewise in the bowels, is often superinduced, and, at times, if

the expectoration be morbidly checked and assume a viscid pituitous character, the breathing becomes difficult, and, in the reclining posture, almost impossible, while the mind is oppressed with a feeling that, unless quickly relieved, life cannot be sustained. In old persons it assumes a somewhat different character; the expectoration is profuse and constant, the pulse feeble and languid, the bodily and sometimes mental powers are characterized by extreme debility, and the disposition to sleep is often so strong, as to give an impression of moroseness. In these chronic forms of bronchitis this climate appears very beneficial, relief being afforded in the older and more confirmed cases, and cure in those of earlier life.

It will also be found useful in many cases of asthma, and in those little, short, irritating coughs, which are dependent upon a subacute inflammation of the larynx. Of course while speaking of these different diseases, it is not to be supposed that climatorial change will alone effect all things, the patient must give every assistance, by the exercise of the extremest caution, and the medical attendant must use those remedial means which present symptoms may require: to enlarge upon these would obviously be out of place. It may, however, be observed that nothing is more requisite, than for the invalid to take precautions against the dampness of the ground so frequent here, to avoid exposure to the coldness

of the night air, as also when the air during the day feels raw and chilling. A damp state of the atmosphere, provided the temperature and the quiescent state of the wind give to it a sensation of warmth, is not injurious.

Dyspepsia. Sir James Clark* is particularly impressive in recommending change to the South of Devon, in the inflammatory or gastritic form of dyspepsia, its symptoms are general uneasiness over the region of the stomach; together with a sensation which is understood by the term "anxiety about the præcordia;" occasional heart-burn, and rising into the mouth of a small quantity of acrid fluid: the action of the heart is varied, sometimes it is increased, and distressing palpitations alarm the patient, at other times it is slow and weak, accompanied by a sensation of sinking and oppression; thirst is frequent; the appetite capricious; the gums sometimes red and swollen; the tongue florid at the side and tip, coated in the centre, with elevated papillæ; the eye slightly suffused; the skin now harsh and dry, then covered with a cold clammy moisture, often a symptom dwelt on by the dyspeptic; the urine participates in this variableness, at one time being clear and pale, at another loaded, and early depositing large quantities of ammoniacal

* On Climate, p. 22.

sediment. As these symptoms increase the mind evidently becomes affected, attention is concentrated with difficulty, unless it be upon the exaggerated view the patient takes of his own malady, memory becomes impaired, and sleep, often banished from the pillow, oppresses unbidden when in the sitting posture. At times a more nervous state is superinduced, the pulse becomes small and quick, the head aches, the bowels are confined, flatulence and borborigma increase to a distressing extent, the limbs shake, the whole nervous system appears upset, and the patient becomes overwhelmed with apprehensions of impending ruin.

A residence in this climate is particularly desirable in this form of disease, causing general amelioration of the symptoms; nor is it less useful, from its power of equalizing and maintaining cutaneous perspirations, in dyspepsia depending upon a morbid action of the secreting surfaces. When this affection is associated with or mainly depends upon general debility, this climate appears to be rather injurious than otherwise; these cases require a more bracing air.

Somewhat connected with the subject of dyspepsia, it may be observed that a constitutional tendency to gout is considerably checked, and the health, in confirmed and chronic cases often materially improved by a residence here. The same may be said of rheumatic affections. In dysentery it appears

particularly serviceable, especially when occurring in the chronic forms, so common in persons returning from hot climates. Cutaneous affections, especially those of a scaly character, are much ameliorated by it.

In some of the derangements peculiar to females, the Devonshire climate is beneficial, in others it is too relaxing; it is more particularly useful in that form of amenorrhœa characterized by the bloodless cheek and lip, shortness of breath, nervous palpitation of the heart, quick small pulse, pain referred to a spot beneath the left breast, and general tendency to constipation. It is also useful when the periodical accession is preceded or accompanied by excessive pain.

Chapter IV.

REMARKS UPON THE PRINCIPAL INLAND AND SEA-COAST TOWNS OF SOUTH DEVON.

It is proposed, in the present chapter, to make a few observations on those towns of South Devon which are usually resorted to in the pursuit of health; in doing so, we shall only allude to their more prominent and individual characteristics, having in previous pages spoken largely of the climate of the district, and its influence upon disease.

Exeter,* occupies the flat summit and declivities of a hill, on the Eastern bank of the river Exe; this hill, the height of which is one hundred and

* Strictly speaking, Exeter must be described as standing within certain limits on the eastern side of the river, but it is ordinarily understood to include the large and populous parish of St. Thomas, situated on its western side, and immediately connected with the city by a conveniently built bridge. The environs of St. Leonard and Heavitree, which lie adjoining, on the south-eastern side, may also be added.

forty-nine feet above the level of the sea, presents a gentle declivity on its northern side, but is abruptly steep on its western.

The city, from its position, size, and importance, has justly been termed the "metropolis of the west." It is traversed by four cross streets, which, for the most part contain the better shops for retail traffic; these streets divide it into four quarters. The western is occupied by the great mass of poor; one portion of which is situated on the steep declivity running westward towards the old town walls, thereby enjoying the advantages of sufficient drainage and ventilation; the other, the worst and most confined, is in a hollow flat at the foot of the declivity: the south-eastern quarter is inhabited by the resident gentry, and is in an open, pleasant, and healthful position: the remaining quarters, namely the northern and southern, are occupied generally by persons, if not affluent, certainly, for the most part, in comfortable circumstances. About the centre of the town stands the noble cathedral.

From the elevated character of the ground upon which Exeter is built, great facilities for cleanliness and ventilation are afforded, notwithstanding the narrowness of some of the older ways. The system of drainage has latterly been much improved; it was but a few years since that the drains were merely surface gutters in the centre of the streets, necessarily the cause of much offensive unpleasant-

ness; this has however been recently obviated, by an extensive series of sewers, running underground through all the streets, with the further advantage of a local authority to oblige communication from every house.

The river Exe, from which the city takes its name, is the great and important water of the south of Devon. It has its origin in the extensive moor district called Exmoor, from whence it flows through varied and beautiful country, and expands itself into a fine river at Tiverton; then winding through the romantic and wooded vale of Bickleigh, enters the district now under our notice. It flows over the new red sand formation, between the red rock of Thorverton and Silverton, and between Brampford-speke and Netherex, and pursues its course over the schist to Exeter. Below the city, at the quay, it again flows upon a bed of new red sandstone, falls over many weirs, and passing through fertile meadows, reaches Topsham; then flowing between Lympston and Powderham, and over the bar at Exmouth, which is of red sandstone rock, and not of sea sand, as is generally supposed, empties itself into the English channel, having from its rise to its mouth pursued rather a direct course of sixty miles, with a fall of one foot in four hundred and eight. The Exe receives several tributary rivers: the Creedy, the Culm, the Kenn, and the Clyst, are within the immediate neighbourhood. The height of the river

is affected by the tide to within a mile of Exeter, where any further influence is prevented by a weir. At the quay the breadth of the river is one hundred and twenty feet, and its depth averages rather more than nine: it is often flooded by continued heavy rains, when its waters come down greatly discoloured, especially after the junction of the Creedy, which rising near Cruwys Morchard, passes through the rich red country between Sandford and Upton Helions, and discharges itself, loaded with this soil, into the Exe, two miles above the city. These floods generally take place between November and March, during which the river seldom rises more than six or seven feet above its summer level: on the the 16th of November, 1800, however, it rose between thirteen and fourteen feet; this was the greatest flood ever known, and was caused by the melting of snow, on Dartmoor, together with thirty-six hours rain. The impurities by which the water is discoloured on these occasions are only suspended; its general character is that of being clear, soft, and pure. By analysis it is shown to contain muriate of lime, and a trace of iron; its taste, from a deficiency of fixed air, is somewhat flat, and consequently not pleasant as a drink; but for all domestic purposes it is perfectly unobjectionable.

The inhabitants are abundantly supplied with the purest water; from wells of different degrees of hardness; by the conveyance of springs from some little

distance to a public conduit; and by a fine and capacious reservoir, which is supplied from the river, two miles above the city: of the works connected with this, we shall speak in a subsequent page.

The neighbourhood abounds with very beautiful country, which is peculiar, from its extreme variety; within only a short distance presenting the different aspects of moor, mountain, and woodland scenery. Its general character is that of a succession of small undulating hills, diversified by bolder swells, which increasing in height as they recede from the city, are eventually lost in the elevated ranges, which form its protecting boundaries; so that Exeter, though for the most part standing on high ground, is yet surrounded by a noble, though somewhat distant, amphitheatre of hills, on every side excepting to the south-east, where the broadly-expanded estuary of the Exe opens to the English channel. The more prominent boundaries of the neighbourhood by land, are, to the south-west, Haldon, and at some distance beyond, the long line of Dartmoor; the former presenting a protecting barrier of more than eight hundred feet above the level of the sea, while the latter is an extensive mountain ridge, whose mean height is one thousand seven hunded and ninety-two feet, its highest point, Cawsand bog, being, according to the survey of General Mudge, upwards of two thousand and ninety feet. To the north are the Whitestone

hills, which from their proximity, and height of seven hundred and forty feet, form a screen of the most essential benefit; these with an interval of less elevated ground, are irregularly connected, by the Stoke range, to the Woodbury hills, which present themselves as the high lands to the eastward.

Situated on a natural terrace to the north of the city, is the beautiful walk of the Northernhay, abounding with luxuriant elms and limes, which rising considerably above the neighbouring houses, are seen from all directions, crowning them with a mass of dense foliage. Here, as in other elm plantations throughout Europe, that little insect, the *Scolytus destructor*, has committed its ravages, and the premature decay of many of the trees has taken place. Besides natural causes, however, there have not been wanting artificial means of laying waste this spot.

> Persequitur scelus ille suum, labefactaque tandem
> Ictibus innumeris, adductaque funibus arbor
> Corruit.* Ov. Met. lib. viii. fab. xi.

As the "climate of South Devon" has been mainly illustrated from observations made in this city, no allusion to the subject is here necessary, with the exception of the remark, that less rain, by two inches

* "The impious axe is plied, loud strokes resound,
'Till dragged with ropes, and fell'd with many a wound,
The loosen'd tree comes rushing to the ground."

and a half, (2·78) is registered as falling annually in Exeter, than is there stated as the average of the district.* When describing the general character of the climate, I preferred quoting the higher averages of St. Thomas, as indicating, more correctly, the quantity of rain proper to the district. Though the smaller amount of rain registered in Exeter may in some respects be owing to the position in which the guage is placed, yet there can be no doubt that it is really liable to less, from the elevated masses of land to the westward attracting the clouds to that bank of the river.

Exeter is well supplied with baths of every description, good accommodation for the casual visitant, and the general requisites for the invalid. As intimately connected with the medical history of the city, we may also observe that it abounds in institutions devoted to the sick poor, such as the County Hospital, the Dispensary, the Lunatic Asylum, the Institution for the Deaf and Dumb, the Blind Asylum, the Leprosy Hospital, the Lying-in charity, &c., &c.

The neighbouring parishes of HEAVITREE and ST. LEONARD, are more exposed, and situated generally rather higher than Exeter; their mean annual temperature, according to Dr. Barham's observations, is rather less than that of the city,† but not more so

* *Vide* antea, p. 23. † Heavitree, 51°·4′. Exeter, 51°·29′.

than might be expected from the differences of their localities. The village of IDE is situated in a valley at the foot of a steep hill, about a mile and a half to the west of the city, and very much sheltered from the winds in general. Its climate must be rather warmer and more relaxing than that of Exeter. Each of these places afford convenient accommodation for the invalid, and together with Exeter, are, in the winter and spring seasons, very suitable to persons suffering from an irritable state of the lungs, and chronic bronchitic affections generally, as well as to those of a consumptive tendency. They are, in fact, generally beneficial in those cases for which the climate proper to the district is applicable.

MORETON and CHAGFORD are country towns, situated inland, on the borders of Dartmoor, they have little else to recommend them than the beautiful moor scenery by which they are surrounded, and the freshness and salubrity of their climate, the temperature of which is considerably lower than that of the district generally. They must only be regarded as summer and autumn residences, and are more particularly useful in cases of weakness after febrile attacks, and to obviate the debilitating effects of pectoral disease, especially if accompanied by a tendency to colliquative perspirations, which in the warmer districts of the county, are often very weakening and harassing.

The other inland towns, which in point of population are important, as CHUDLEIGH, TIVERTON, OTTERY, CREDITON, CULLOMPTON, &c., form comfortable and desirable places of residence, but do not require particular mention in a sanatory point of view.

UPTON and WEST HILL, in the neighbourhood of Torquay; BISHOPSTEIGNTON, a few miles above Teignmouth; and LYMPSTON, on the Exe, are small villages, sheltered and pleasantly situated, and may in some cases be preferred to the coast itself, especially where the advantages of sea-air are desired, without exposure to its immediate influence.

TORQUAY has for many years been celebrated as a suitable winter residence for persons requiring a mild warm climate, and on this account is constantly referred to by Sir James Clark.

It is situated in a cove at the north-west angle of Torbay. This cove is surrounded by three hills, "nearly equal in elevation, (180 to 200 feet) and "similar in general features. Between them run two "tortuous valleys, one towards the east, the other "towards the north. It is on the shores of the cove, "along the slopes of the hills, and in the gorges of "the valleys, that the town is built," facing the south-west, and sheltered from the north and east. It presents the appearance of a number of rising terraces, which receiving the direct rays of the sun, unchilled

by the colder winds, form safe and pleasant walks for the invalid. The scenery from these terraces is peculiarly beautiful; immediately beneath is expanded the bay, like a small inland sea, on every side bounded to the view by wooded heights.

The climate of Torquay is generally understood to be amongst the warmest, and most genial upon the coast, but in the absence of sufficient information, its accurate position in this respect cannot be stated. Many observations on its temperature, &c., have certainly been registered; more especially by Mr. Blewitt, Drs. Coldstream and Barry, but at such irregular times, and for so short a period at each time, that it is quite out of the question deducing from them anything like satisfactory averages. From these, however, it appears that its mean annual temperature is rather more than fifty one degrees and a half (51°·65), nearly half a degree warmer than Exeter; and the mean winter temperature, above forty-four degrees (44°·25) which is more than three degrees warmer. The mean difference between the temperature of successive days in the cold season, may be stated at 2°·7; its daily range appears also to be small. The general mildness of this place may be somewhat appreciated by the statement of the lowest degree of cold experienced in the generally severe winter of 1837-8, being only 21°, while in Exeter it was 17°, Bristol 8°, Kensington 0, and at

Sandhurst 8° below zero. Dr. Coldstream,* during a winter residence at Torquay, (1832-3,) made a series of observations upon the temperature of his bed-room, at 7 A.M., in which no fire was kept; they are extremely interesting, and would be useful if more generally made; the temperature of the interior of houses being of the greatest importance to the invalid. From these† it appears that within-doors the air was nearly two degrees (1°·80) warmer during the winter months, than the mean of the external atmosphere. This relative difference of temperature is much influenced, as might be expected, by the prevalence of wind, for we find that, in the comparatively calm months of December and January it is considerable, (2·54,) while in March it scarcely exceeds half a degree (0·58.) The air of Torquay is generally drier, and more free from fog than is common to the Devonshire climate; it is also said to be less subject to rain. In 1838 there fell only 35·1 inches, while in Exeter 38·9 were deposited, at Plymouth 40·6, and at Plympton 43·7.

* Vide *Edinburgh Med. and Surg. Journal*, vol. xl.

†	Nov.	Dec.	Jan.	Feb.	March	Mean
House.....	51·73	49·87	44·84	48·36	44·09	47·77
Ext. air	49·87	47·73	41·89	46·77	43·51	45·97
Difference ..	1·86	2·14	2·95	1·59	·58	1·80

Though this is merely the statement of one year, and as such cannot be conclusive, yet it is to a certain extent confirmatory of an impression generally entertained. It is asserted* that large rain-clouds coming from the south are frequently seen to divide before reaching Torbay, one part going up the valley of the Dart, the other passing on towards the valley of the Teign, thus avoiding Torquay altogether. Indeed its situation, midway between these two river courses, is supposed by many to contribute greatly to the dryness of the locality; but this statement, as well as that which imputes a similar effect to the limestone rocks† on which the town is built, requires more distinct proof than has hitherto been adduced.

Though the lower part of Torquay is not deficient in wells, yet the town is chiefly supplied with water from two springs, one at Tor, the other near the summit of Braddon hill. This water is conveyed from these sources through iron pipes. It is clear and sparkling; strongly impregnated with lime, and contains some little iron; its temperature at the fountain-head is about 52°; it may be considered agreeable, and wholesome, but too hard for many domestic purposes.

The hot and cold baths are very accessible; but the accommodations for sea-bathing are not so convenient as might be wished. The place at present

* *Edinburgh Med. and Surg. Journal*, vol. xl. p. 360.

† Clark on *Climate*, p. 142.

resorted to, is a small cove, with a southerly aspect, remarkably well sheltered, but on a shingly beach, and there are only two or three machines in use: a more pleasant bathing-place is the sandy beach of Livermead, situated about a mile to the north-west of the town.

Torquay enjoys the advantages of a rich and cultivated neighbourhood, abounding in sheltered and accessible drives, through the most varied and beautiful scenery; and offers to the casual visitant the usual *agrémens* of towns of this description. During the summer months, from the warmth and closeness of the air, it is not so pleasant a residence as many upon the coast. Its chief drawback at all seasons is the smell emanating from the mud of the harbour, which is left exposed at every retiring of the tide; the effluvium from this, when a hot sun rests upon it, is often most offensive.

Torquay is peculiarly suitable, during the winter, to persons laboring under chest complaints generally. Those far advanced in diseases of the lungs pass their time more easily to themselves, and freer from the harassing effects of cough and febrile irritation; while those in the early threatening of disease, may not unfrequently date a permanent re-establishment of health, to a residence in its mild climate.

Babbicombe. This small place, within a short drive to the eastward of Torquay, affords a climate

directly its opposite, being open to the north and north-east. Though bleak and cheerless in winter, it forms in summer a most delightful residence; it is situated upon the slope of a steep hill, whose massive rocks, and thickly-planted grounds, constitute a scene as romantic as it is picturesque. This cove is the property of a few persons, who chiefly inhabit it themselves, and consequently affords but little accommodation for strangers. Between Babbicombe and Torbay there is a bone cavern,* well worthy the attention of the curious.

TEIGNMOUTH is situated about fifteen miles to the west of Exeter, partly upon an extensive flat at the mouth of the river Teign, and partly upon the sides of the high hills which bound it to the north-east and north-west. It consists of two portions, East and West Teignmouth, which are divided by a small stream: East Teignmouth faces the sea, and is much exposed to the east winds; West Teignmouth is somewhat protected from these, by the high lands which rise from the sea to the eastward of the town. The beach is rather more open than that of other places upon the coast, by which means the relaxing heat of summer is considerably modified: it must not, however, be thought that the position of the town is bleak or inclement, for observation

* Vide postea.

proves, that the climate partakes of the general equability of the district, the average temperature being about six degrees higher than that of London, from October to May, and five degrees lower from June to September. The west, south-west, and north-west, are the prevailing winds for about ten months in the year: the two former particularly in the autumn; the east, and south-east chiefly blow during March and April; the north-east is comparatively a rare wind.

The country in the neighbourhood of Teignmouth is of very varied character; near the sea the walks are open and accessible; inland and more immediately adjoining the town they are wooded and sheltered; the banks of the river, though rather exposed to the currents of wind which rush up the valley, abound in beautiful views; and Haldon affords moor-like scenery, vast range of prospect, and bracing air.

Teignmouth, until a few years since, laboured under the disadvantage of being ill supplied with water; in the lower portion of the town, which is only a few feet above the level of the sea, the substratum is a recent deposit of sand, so that the sea water finds its way into the wells, more especially at the spring tides, and renders them brackish: in the upper part of the town, which is situated on the red sand-stone, good water is found, but not in quantity sufficient to afford an adequate supply. To obviate this serious

inconvenience, water has been introduced from springs which rise from the lower beds of the green sand formation, on the southern side of Haldon,* and pass over the beds of clay beneath the same at an elevation of from four hundred and twenty to five hundred feet above the level of the sea. This water, which is exceedingly good and pure, is collected in a small reservoir of stone and cement, one hundred and fifty-three feet above the level of the sea, near the village of Coombe; from this the main pipe conveys the water into a larger reservoir,† containing six thousand hogsheads, in the immediate vicinity of Teignmouth, which affords to the town an ample supply both night and day.

The sea-bathing is good, and available at all times of the tide; the sands are perhaps better than on any beach upon the coast. There are hot, cold, vapour, and medicated baths, which are conveniently situated, and well appointed. As a place of sojourn for the

* Immediately above a farm called Lower Venn.

† Mr. J. B. West, under whose direction the works have been completed, informs me, that the water is carried from the large reservoir through the town by iron pipes or mains, each main having an auxiliary or smaller main, by its side, with a cock to each auxiliary, the houses are supplied from the auxiliary pipes, so that in case of a fire all the auxiliary cocks would be shut, and the whole pressure of the reservoir, which is a hundred and twenty feet and upwards above the lower part of the town, would be brought into effect, and by fixing a stand pipe and hose in one of the fire plugs, with which the town is abundantly supplied, water can be thrown with the greatest force over the highest house in the lower part of the town by its own pressure, and thereby saving the use of a fire-engine.

invalid, Teignmouth can be recommended from the beginning of June to the end of October: it is not so favorable during the remainder of the year, and in the spring is decidedly ill adapted to persons with weakly constitutions.

To those visiting it, in the summer and autumn seasons, I should recommend the houses on the Den and more elevated portions of the western division of the town; the low western portion adjoining the river is not favorably situated, being exposed to the currents of air rushing up and down the valley, and which often bring with them cold rains; and to the exhalations from the vast surface of mud, laid bare at the retiring of the tide.

Take it altogether, Teignmouth forms a pleasant place of residence, and from its size and situation presents many advantages to the stranger and the invalid. It is spoken of as remarkable for numerous instances of longevity, and for being particularly exempted from epidemics, or serious prevalence of fever. It seems very well adapted for restoring the health and strength of those who may have suffered from the climates of the East or West Indies, and to cases of inflammatory dyspepsia,

Dawlish, is a small and pleasantly-situated watering place, about twelve miles from Exeter, chiefly occupying a narrow valley which opens to the sea towards the south-east. It is approached

by the steep slopes of the hills that bound it on either side, and possesses an air of cheerful seclusion and quiet, which is very inviting. It is, however, of greater size than its first appearance indicates, extending to some distance up the valley, and almost in continuance with the small hamlet called Dawlish Water, whose name is derived from the little stream which passes through it. This stream which forms a cheerful object as it gurgles through the town, is clear and flowing, and finds its way to the sea, over the pebbles of the beach.

Though Dawlish is for the most part inhabited by permanent residents, yet it contains good accommodation for the occasional visitant, the houses are situated, some, upon a terrace walk, near to and facing the sea, some upon the western hill, and others in the valley itself; the two former situations we should recommend during the summer and autumn seasons, the last during the winter and spring.

The nature of the coast renders the sea-bathing very good and convenient, the sands forming a pleasant footing, and the adjoining cliffs giving adequate protection against the colder winds. The walks and drives in the immediate neighbourhood, especially up the valley, are pleasant and accessible, and the nearness of Haldon offers every facility for the enjoyment of the fresh breezes ever to be found upon its heights.

The climate of Dawlish * is considerably warmer than that of Exeter, and I should even think than that of Torquay. During the autumn and winter months there can be no place upon this coast better adapted as a residence for those suffering under pulmonary disease, so entirely is it protected from the prevailing winds of these seasons: this is more particularly the case with the little hamlet of Dawlish Water, a spot which has struck me as singularly mild. During the spring months, however, I should be inclined to regard Dawlish as not a very favorable residence, for patients of the above description, chiefly on account of the east winds which then prevail, and to which, from its aspect, it is peculiarly exposed.

EXMOUTH is situated about nine miles from Exeter, on the eastern side of the estuary of the river Exe. The mouth of this river, which extends to a breadth of three miles, is much obstructed by two shoals of sand, called poles, of unequal breadth, and advancing in parallel directions; from not being connected, they have merely the effect of narrowing the channel, and not of lessening its depth. The

* It is to towns of the size of Dawlish rather than to large cities, that persons of a consumptive tendency, or liable to febrile attacks should resort; for it has been shown most satisfactorily by Mr. Farr, in his Third Letter to the Registrar-general, that in these latter, liability to consumption is increased twenty-four per cent., and to typhus, fifty-five per cent.

greater mass of the sandbank, on the western side of the river, called the Warren, is now raised above high-water level, through the agency of the sea matweed (*arundo arenaria*), which has retained the sand carried by the south wind. A portion of the town is built upon low ground, looking towards the north-west, and having rather a river aspect; while the remainder occupies the summit of a hill, called the Beacon, facing the sea towards the south-west. The view of the opposite coast from this hill is peculiarly striking; immediately beneath are seen the above-mentioned extensive shoals of sand, whose circling banks are partially washed by the river and the sea; beyond these are the wooded hills intervening between the opposite shore and Haldon; and gradually receding into the distance are the various headlands, which secrete behind them the several sea-coast towns already described. At high water the river scene is very beautiful, the banks on either side being wooded to the water's edge; but at low water it is greatly detracted from by the extensive surface of mud then laid bare. The exhalations from this mud are at times exceedingly offensive to the small portion of the town which lies contiguous to the river; the greater portion, however, is sufficiently distant to prevent any very sensible effects from it, and the houses on and adjoining the beacon are entirely beyond its influence.

The face of the Beacon cliff is planted with shrubs

and evergreens and cut into zigzag walks, leading to the sands below, which are not very firm, and approached only through a quantity of loose dry sand, exceedingly fatiguing to traverse. Hitherto, there has been no very convenient walk near the sea, but this great requisite is now being supplied, through the munificence of Lady Rolle, to whom Exmouth already owes so much, by the construction of a sea-wall,* for the protection of an extensive terrace, walk, and drive, which will form one of the noblest works of the kind upon this coast. The cliff at the east of the town, fronting the sea, arches round into a semicircle, protecting a considerable portion of dry sandy ground, from the north and easterly winds, thus affording, during their prevalence, warm and pleasant airing grounds; the sea and land views, from this spot, are particularly fine. The immediate neighbourhood abounds in wooded lanes, and path-fields, and at a short distance, the open downs of the Woodbury Hills offer an eligible district for horse and carriage exercise. In consequence of the protective power of the bar, water excursions are much more attainable than in most other places upon the coast.

Notwithstanding the south-westerly aspect of

* The dimensions of the sea-wall, which is of limestone, are as follows: length 1800 feet, (and it is, I understand, in contemplation greatly to extend it) height 22 feet to the coping. The wall is secured by a row of sheet piling 10 feet long.

Exmouth, it offers a more bracing climate than any of the watering-places here described. It may almost be said to be unsheltered by any immediate neighbouring ground, though to a certain extent the Woodbury Hills protect it from the north. Exmouth at times suffers severely from the south-westerly gales, which blow immediately into it; but, as the winds from this quarter, rarely bring a low temperature, no other inconvenience is suffered from, than the violence with which they blow. The north-west is the blighting and obnoxious wind of this place, and not the easterly, as is more usual on the coast. The climate partakes of the same character as that of the district, modified by the sea only; an inhabitant to whose opinion I would defer, thinks it more equable than any upon the coast, and that this may in some measure be owing, to its exemption from the damp vapours so often experienced in the valley towns. In the absence of direct observation, this can only be taken as a vague opinion, as must also the statement, that Exmouth, in common with Budleigh Salterton, is less liable to rain than other places in the neighbourhood. Certain it is, however, that clouds from the Atlantic are frequently seen coming as it were straight towards it, and then seemingly attracted by the line of high lands from Berryhead to Haldon, sweep by, before they discharge themselves, into the interior of the country.

Exmouth contains houses of every kind, which

are available for the occasional visitant; we should more particularly recommend those on the Beacon, Louisa, and Trefusis Terrace, and on the Sidmouth road: the water in this higher district is good, which is not the case in the lower part of the town.* The baths are accessible, but not of the best description. An objection has been made to the sea-bathing, in consequence of the large dilution of fresh water which is occasioned by the flowing of the river: there can be no doubt that this somewhat influences it, but not so seriously as to condemn it altogether; at any rate the objection is superseded on the rising of the tide, and is somewhat balanced in the advantage gained by the position of the bar, which renders the surface of the sea generally calm, a quality of the greatest consequence to nervous people.

From its aspect and open situation Exmouth presents no great objections as a residence, at any season of the year. It will be found particularly serviceable as a resort for weakly children, and those of a scrofulous constitution, and where change is required in the debility consequent upon attacks of fever, or during convalescence after other diseases: no place upon the coast could be better chosen for these purposes. I should also strongly recommend it in irritable indigestions, catarrhal affections, and more

* A company has just been formed to obviate this inconvenience, by introducing a plentiful supply of good water from a short distance.

especially in the dry asthma, which experience has often shown to be greatly benefited by it. Its exposed situation, I cannot but think, renders it injurious in the severer affections of the chest, and particularly in cases where there is a tendency to hæmorrhage or inflammation of the lungs, as also where consumption has been fully developed. To rheumatic complaints it appears particularly inapplicable—those liable to such affections invariably suffer. Female derangements are benefited by a residence in the higher part of the town, but in the lower there is too great a tendency to produce relaxation.

In a sheltered valley, about a mile to the north of Exmouth, is the very picturesque village of WITHYCOMBE; it is well adapted for persons in the more advanced stages of consumption, but its moist atmosphere and extreme verdure render it unfavorable in cases dependent upon a relaxed constitution. Notwithstanding the short distance of this village from Exmouth the most marked difference exists between their climates. The accommodation for strangers is very limited.

BUDLEIGH SALTERTON is pleasantly situated, about three miles and a half from Exmouth, in a valley facing the sea towards the south-east; to the winds from this quarter it is exposed, but is tolerably

well protected in all other directions. It offers a warm and genial climate, and in common with Exmouth is less liable to rain than other places upon the coast. It contains hot, cold, and shower baths on a small scale; the open sea-bathing is not particularly good from the total absence of sand, the shore consisting of a mass of large-sized water-worn pebbles, which are heaped up in a steep acclivity against the sea, so that deep water is immediately gained. This pebbly nature of the shore renders the sea particularly sounding, to the increased noise of the breakers is added that of the pebbles as they fall over each other at the retiring of the waves. Facing the sea there is a pleasant terrace-walk; otherwise, from the smallness of the valley and the general steepness of the hills, the airing-ground is very limited; this is the more to be regretted as the stony character of the shore renders walking on it tedious and fatiguing. A small streamlet flows through the town, and a little to the eastward the river Otter empties itself into the sea, partly through a narrow open channel and partly through a raised bank of the water-worn pebbles.

The general character of Budleigh Salterton is that of a small unobtrusive watering-place, affording good accommodation for those desiring a place of quiet sojourn. The houses on the strand immediately facing the sea are conveniently situated, but those on

the high grounds are generally preferred, except where climbing the hills is of consequence to the invalid.

It is considered to be particularly healthy, and as a residence is applicable to those disordered states for which the climate of the district may be generally recommended.

SIDMOUTH. This well-known watering-place, situated about fifteen miles to the east of Exeter, is most conveniently approached by a drive of nearly two miles through the luxuriantly-wooded and pretty valley of the river Sid: it consists of a town, built upon a diluvial deposit of gravel, overlying the red sandstone at the bases of the Salcombe and Peak hills, together with numerous detached villas, which are scattered over their lower sides. These hills are about five hundred feet in height, with their summits not much more than a mile distant, so that they shelter the town very adequately, the latter to the westward, the former to the eastward: the valley itself is more distantly protected towards the north and north-west by the Honiton range, Cor hill, and the rising grounds of Harpford woods; in fact, Sidmouth is only exposed to the south, where it faces the sea.

Though the town occasionally suffers from south-westerly gales, which, when blowing hard, roar up the valley, covering everything to a certain distance

with saline particles, yet it enjoys a complete protection from the easterly winds, which have been previously shown to be the most trying of the district. Its generally sheltered position and southerly aspect naturally renders the climate very mild, probably more so than that of any of the places hitherto described. The mean temperature (51°·50) is nearly a quarter of a degree higher than that of Exeter, and the diurnal difference is considerably less.

The steepness of the high lands in the immediate vicinity of the town, somewhat contracts the space for out-door exercise, but pleasant and sheltered walks are to be met with in the wooded valley, and by the shore the invalid can enjoy the fresh sea breezes, on a wide and extended terrace-walk, which commands a striking view of the expanded sea and the picturesque headlands on either side. The worn surfaces of these headlands are particularly interesting from exposing the geological formations of which they are composed: their bases are of the new red sandstone, surmounted by the green sand, which in the Salcombe hill is capped by the commencement of the chalk.

The water, which is procured from wells in the portion of the town immediately facing the sea, is hard and brackish,* while at a very short distance, more inland, it is good and wholesome; much, however,

* This inconvenience is likely shortly to be obviated, as it is in contemplation to supply the town from the Cotmaton stream, which affords at all seasons a sufficiency of excellent water.

appears to depend upon the depth of the wells, the deepest affording the best water.

Sidmouth offers to the occasional visitant the usual requisites for a sojourn by the sea-side; there are hot, cold, and shower baths, and the sea-bathing is good; the beach is somewhat stoney, though not so much so as to occasion any great inconvenience. Immediately to the east of the town is a small cove which affords excellent sands, but it is not sufficiently accessible for bathing.

Both from its size and climate this place offers an agreeable residence to persons who have lived long in the warmer latitudes; it is well adapted for those labouring under affections of the liver; and during the autumn, winter, and spring seasons for the consumptive invalid; indeed, I am inclined to think that during the spring months it is the best place upon the coast for those liable to pulmonary complaints generally; during the summer it cannot be recommended, being then too hot and relaxing.

It has been asserted that Sidmouth is peculiarly obnoxious to females labouring under menorrhagia; the experience of the resident practitioners does not bear out this opinion, on the contrary, they deem it beneficial in these cases, as well as in dysmenorrhœa. They also think it particularly serviceable in those cases of over-wrought intellect, in which the undue wear and tear of mind is followed by a series of anomalous and depressing symptoms, chiefly charac-

teristic of a state of general irritability and excited morbid feelings.

In chronic dyspepsia it does not appear to be a favorable situation, nor in those diseases generally to which the leuco-phlegmatic temperament is peculiarly liable.

PART II.

GEOLOGY, NATURAL PRODUCTIONS, ECONOMICAL HISTORY, AND STATISTICS OF THE SOUTH OF DEVON.

CHAPTER I.

GEOLOGY AND HYDROLOGY OF THE SOUTH OF DEVON.

IT is so well understood that the nature of the soil modifies the climate, impresses a character upon the waters, and influences in many respects the condition of the animal economy, that I feel no apology is required for devoting a few pages to a slight sketch of the geological formations of the district. It is evident that any very detailed account would be inapplicable, I shall therefore confine myself to a general description. In doing this I have been greatly assisted by Joseph Parker, Esq., who has latterly made the South of Devon the particular object of his researches.

The rocks which offer themselves to notice present individuals of a very extensive series, ranging from the granite to the lower cretaceous group: the series,

however, is by no means complete, many of the intervening rocks being wanting.

Those which present themselves for investigation are granite, grauwacke slates, carbonaceous rocks,* schists, limestone, new red sandstone (including *Exeter Conglomerate*), green sand, granitic green stone, and trap rocks.

GRANITE. The granite of Dartmoor† varies in the size of its constituent parts, from the fine-grained to the coarse-grained and porphyritic kinds. Haytor affords examples of the former in abundance—of the latter many may be seen in the neighbourhood of Moreton.

Porphyritic granite, consisting of a base of fine-grained granite of a tolerably uniform character, in which are imbedded large crystals of felspar, is common on Dartmoor; associated with this, somewhat rounded spots, of an almost black colour, may frequently be seen; these are a composition of black hornblende and felspar, the former predominating, of a fine grain, and approaching to the nature of basalt. This formation is composed of huge rhomboidal masses, presenting a jointed structure.‡

* Under this name are comprised the rocks, schists, slates, and clays so described in the Ordnance Survey.

† The granite of this district is viewed by Professor Sedgwick and Mr. Murchison, as referable to the secondary formation, and as being more recent than the coal measures.

‡ In the Literary Gazette, Nov. 11, 1837, is a notice of a paper by

Combinations of all the various elementary components of granite may be found scattered over the moor, as well as masses of the components themselves separately lying among them, excepting mica.

The quartz of Dartmoor consists of the common white quartz, in detached masses, or in veins of greater transparency, and enters into the composition of the granite in variously sized grains, or in the form of crystals. Its colour is generally white or gray, and very often the apices of the more transparent crystals assume an amethystine hue.

The felspar is generally red, white, or gray, of various shades, but occasionally, when in contact with what has been denominated shining ore (a species of micaceous iron), it is changed to an olive green, and appears to have lost much of its crystalline appearance, approaching to the nature of compact green felspar. Sometimes a compact green felspar is scattered thinly through a red granite.* The felspar

Professor Sedgwick and Mr. Murchison, where it is said,—"The jointed structure of the granite of Dartmoor is described in detail, and the joints in their direction are shown to agree with those described by geologists in Cornwall; and the authors confirm a remark of Dr. Boase, that the same master-joints often affect the granite and bedded rocks near them; they show that the granite has, in some places, broken through the stratified formations without very much changing their strike. In all such cases the beds are changed in structure near the granite; the silicious beds being converted into quartz rock, the shales into Lydian stone, felspar, porphyry, &c. They regard these facts as perfect proofs of the metamorphic nature of the rocks in contact with the granite of Devon."

* Tor, near Redway.

is found in crystals of various sizes, disseminated through the granite: it is also occasionally found in very considerable independent masses, and but little mixed with other matters. Two instances of this may be observed in which the colour of the felspar is red; one at the top of the hill entering Moreton, below the turnpike, the other at the quarry near Willey, whence the Devonshire tourmaline, as it is called, was frequently obtained.

In many parts of the moor the felspar has become decomposed, lost its crystalline appearance, and crumbled into a white powdery clay. This appears particularly the case on the borders of the moor; it may also be observed on the sides of the old road leading to Moreton, and adjoining Bovey Tracey, on the road to Willey. In this decayed state granite has obtained the vulgar name of growan stone, and affords the fine porcelain clay used in the manufacture of china, &c. so much of which is conveyed to the potteries of Worcester. It is usually met with in hollows, but in some parts of the moor, where the ground is more plain, and the clay less readily carried off, it occurs two, three, or more feet beneath the surface, forming a bed* under the quartz sand, from which, by its decomposition, it had been separated.

The great plain of Bovey Heathfield affords a sin-

* Dr. Paris thinks these beds good manure for the sandy plains.

gular instance of this deposit*. It appears to have been an immense pit; at present it is filled with clay, the produce of the decayed rocks of Dartmoor. It has been bored to the depth of two hundred and twenty feet, at which depth there was still clay and sand.

The mica of Dartmoor is commonly crystallized in small plates, and varies in colour from nearly white to black. It is thinly (though generally) disseminated through the granite. It has not been found in large masses.

The mineral and metallic substances most commonly found in the granite of Dartmoor are hornblende, schorl, tourmaline, apatite, compact felspar, numerous varieties of quartz and calcedony (Haytorite), clovite, lead, copper, tin, and iron.

Hornblende and schorl occur in considerable quantities throughout the district: they are found massive or imperfectly crystallized, as also in well characterized crystals. Amongst the red felspar, near Moreton, schorl, in fine crystals of a stellated form, is found, and, united with quartz, exhibits, in various parts of the moor, beautiful varieties of the schorl rock: near Willey it occurs in very large crystals, combined with apatite, embedded in a rock which is composed of quartz and red felspar. These specimens are now scarce.

Copper and lead have been sparingly found, tin

* Vide postea, p. 192.

in greater abundance. Remains of ancient stream tin works are frequently met with, and there have also been, and still are, some mines worked underground.

Iron is found in the form of micaceous iron ore. In the schist district it is wrought under the name of shining ore: an east and west iron lode is now being worked above the village of Hennock. Sulphuret of iron is met with, though very rarely; as also molybdena, disseminated through quartz near Moreton; uranite, or uran mica, has been found in some of the Dartmoor mines.

Haytorite, or pseudomorphous crystals of calcedony, occurs at Haytor, (whence its name is derived,) of various sizes, taking the form of quartz, garnet, and iron pyrites. Haytorite is met with as hydrophanous, stalactitic, mamillated, botryoidal, &c.

That portion of the granite which falls within our present view, begins in Sandy Park, about a mile and a half above Fingle Bridge, where it is found crossing the river from the north to the south side, directing its course about east south east. The boundary line then rises rapidly from the bed of the river to the hills over Moreton woods; thence it continues, in nearly the same direction, along the ridge of these hills, and almost parallel with the river, to a point south of a farm called Lynch, on the top of the hill opposite Dunsford; from this farm it suddenly takes

a southerly direction. Near Bovey Tracey it passes somewhat to the eastward, then to the southward again, until it crosses the Dart, a little above Holne. In this line the granite appears to be in contact with the carbonaceous rocks.

The surface of this district is much varied by the frequent occurrence of Tors, these are formed by various sized rhomboidal masses of granite lying upon each other, and reaching sometimes to a considerable height, and presenting occasionally the most picturesque appearance. The numerous Logan stones and rock basins which have been noticed on Dartmoor, owe their origin to the decomposition of the granite. Of the former, a small one on the east side of Lustleigh Cleeve, another in the valley of the Teign, below Whiddon Park, and a third weighing about a hundred tons, at Widdecombe, are well known. The basins may be noticed on almost every part of the moor; but perhaps in few instances has decomposition produced larger excavations in this way than at Hell Tor, near Moreton.

The peat does not appear to differ from the peat of other mountainous districts: it is a network formed of the roots and stems of aquatic plants, and generally covers the wilder part of the moor, and in some places is of considerable depth. Trunks of trees have been occasionally found in it.

The surface of the decomposed granite, where a sufficient depth of soil can be obtained, is of consi-

derable value to the farmer, particularly for the cultivation of the potato.

Grauwacke Slates. The Grauwacke Slates, to the west of Newton Bushel, form a portion of the vast sedimentary deposit occupying nearly the whole extent of South Devon, and extending generally over Cornwall; it is considered to be identical with the Grauwacke of the north of Devon. This deposit consists for the most part of argillaceous slates, and arenaceous conglomerates, intermingled with gray compact limestones, and trappean rocks.

The slates vary, from a tolerably fine roofing slate to a shaly ash, and occasionally pass into compact and vesicular dunstone. Their colour is chiefly gray and red, but presents every shade between these and brown. The arenaceous conglomerate, with which they are associated, is for the most part schistose or micaceous in its character, but in some places contains quartz pebbles about the size of a nut. The bands of limestone appear to have been deposited at the same time as the slates, whilst the trappean rocks have evidently been intruded amid the slates and limestones, after these latter have been consolidated.

Until latterly it was supposed that the Grauwacke slates were deficient in fossil remains. Encrinites, turbinolias, trilobites, &c., have however been found in tolerable profusion; organic remains have also

been found in the trappean ash immediately beneath the limestones.

It is extremely difficult to determine the true dip of the beds of this formation, for the lamination planes vary from a perfect parallelism with the planes of the bed to very considerable angles with them, and are sometimes constant in their direction and dip, while the beds they traverse are much contorted.

The geological position of this series is below the carbonaceous rocks and the new red sandstone.

The soil is very fertile, and well adapted for the general purposes of farming.

SCHIST. The schistose rocks of this neighbourhood (provincially called shillet) have been provisionally named "carbonaceous" by Sir H. De la Beche; others have described them as a part of the carboniferous strata, and an opposer of the latter classification has separated them into different divisions, and called the lowest member Coddon Hill grit, and the next floriferous slate, above which he places the killas. Without entering into the question of the antiquity of these rocks, it may be convenient to use some of the names just mentioned.

The first of the carbonaceous series, distinguished as the Coddon Hill grit, is an exceedingly hard compact rock, of various tints, gray and blue, occasionally reddish and olive green. The slaty structure, in

its perfect crystalline state, is not always discernible in it, but may generally be seen on the approach of decomposition and decay.

In the district under consideration, it borders, and reposes on, the granite, dipping away from it; and in some instances it is in contact with the greenstone. Associated with it at Drewsteignton are beds of limestone; at Doddiscombsleigh, the grit itself is highly calcareous, and contains fossils. The minerals of this formation most commonly worked are limestone, iron, and lead.

The next in the series has been named floriferous slate, and consists of various strata of arenaceous rock, schists, and clay, alternating with each other; it may be distinguished from the Coddon Hill grit, by its tendency in all the schistose beds, to separate into pieces, approaching a rhomboidal form; by the total absence of the flinty character so common in the former; and by the great abundance of small fragments of vegetables, with which some of its beds abound. These strata are usually found conformably overlying the Coddon grit, though in some cases their separation may not be very distinct: generally the individual beds appear to spread over very limited areas, and, in their direction, to be quite independent of the more extended course of the entire mass of strata.

The position of these rocks is considered to point out the existence of an anticlinal axis ranging from

the neighbourhood of Dunsford towards Exeter, on the respective sides of which the general dip of the strata, independent of the contortions they exhibit, is towards the north and south, with some slight deviations from those points. In some parts of the line of axis, the strata appear quite vertical, as may be seen between Holcombe Burnel and Dunchideoch, and generally, on either side, the angle of inclination is great. The contortions in this and the accompanying series are numerous and extensive, in order to account for which Mr. Parker suggests the following explanation. If these strata may be considered to have been deposited under water, in a position, as regards the whole mass, nearly horizontal, but, as regards individual parts, at the various angles of inclination which might be produced by alterations in the currents of water by which they were formed; that subsequently, when in a partially indurated condition, they were disrupted, and rapidly elevated, nearly to the positions in which they are now found, and, when thus turned up almost on their sides, through the effects of gravity acting on the unsettled masses, a partial subsidence took place, the consequence would appear to be, that the strata, formerly straight, would in some cases become curved, and those originally curved would have those curvatures greatly increased, and thus present to view contorted and broken lines of stratification, very much resembling those we find in these rocks.

They are coloured variously with tints of gray, blue, green and red, generally dull. They vary much in hardness and durability, being in some places friable, in others exceedingly hard, and have occasionally a conchoidal fracture, but the fractured surface is not smooth like flint slate. It is a stone very well adapted, and frequently applied, to the purposes of building and road-making.

The schistose rocks appear of a firmer and more crystalline structure as they approach the granite,* and the same appears to be the case as it is followed deep in the earth: on the other hand, they become less compact as they approach the red land that bounds them on the side opposite the granite. Near the granite, and at great depths, they are for the most part of a deep blue; whilst at the surface, where they are decomposed, and near to the red sandstone, the various tints of red, green, and purple, are most commonly met with.

The geological situation of these rocks is above the greenstone and Coddon Hill grit, and beneath the red sandstone. In many places they pass into the variety called roofing slate,† having a perfectly smooth and even cleavage, and a close compact texture.

* In all such cases the beds are changed in structure; the silicious beds being converted into quartz rock; the shales into lydian stone, felspar, porphyry, &c.

† Quarry at Tedburn, and veins in neighbourhood.

The minerals of common occurrence are micaceous iron ore and manganese, and lead and copper in small quantities.

In following the veins of manganese in the parish of Doddiscombsleigh, beds of jasper are found associated with them. Some of this jasper is of great beauty, and in every way identical with the eyed jasper of Siberia.*

This formation contains many vegetable impressions, of which the chief are *Cyperites bicarinata*, *Pecopteris lonchitica*, the knots, apparently, of a sigillaria, and a great variety of calamites, as well as goniotites, and other marine fossils. These usually occur in somewhat flattened concretionary nodules, which are found both in the soft and hard beds, and in many cases seem to have constituted *nuclei*, around which the oxide of iron, alumina, iron pyrites, and other minerals of which they are composed, have collected. The neighbourhood of Pinhoe, near Exeter, has been very productive in these fossils; they have also been discovered in the same range of hills on the south-eastern side of the Exe, near Oakford bridge on the Creedy, at Cleeve, near Newton St. Cyres, and near the Oakhampton road, about five miles from Exeter.

* "The only bed of jasper that I have seen among the English rocks occurs associated with beds of manganese ore at Doddiscombsleigh, in Devonshire." (Bakewell's Geology, p. 142.)

Good sections of these strata may be seen on one or both sides of the Exe, from Stoke Canon bridge to Exeter, and in many other places in the neighbourhood.

The soil produced by the decomposition of the superficial parts of this formation is well adapted to the growth of wheat, but the manner in which it is broken into a continuation of steep hills and narrow valleys, and the stiffness of the soil are considerable impediments to its attaining a high state of productiveness.

Limestone. The limestone* of this district is, for the most part, compact, hard, and semi-crystal-

* The limestone of this district is very generally allowed to be referable to the transition series. "The origin of the limestones," Sir H. De la Beche observes, "is far more difficult of explanation than the sandstones and slates in which they are included. We cannot well seek it in the destruction of pre-existing calcareous rocks; for as far as our knowledge extends, such rocks are of comparative rarity among the older strata. In fact, the quantity of calcareous matter present in the grauwacke group greatly exceeds that discovered in the older rocks; and the same remark applies to many of the newer deposits when considered with reference to the grauwacke series. If we take the mass of deposits up to the chalk inclusive, we shall find that, instead of a decrease of carbonate of lime, such as we should expect if that contained in each deposit originated solely from the destruction of pre-existing limestones, the calcareous matter is more abundant in the upper than in the lower part of the mass; and we may hence conclude that this explanation is insufficient. If, as has been done with other limestones, we attribute the origin of the grauwacke limestones in a great measure to the exuviæ of testaceous animals and polypifers, we

lized; some masses are met with very highly so, especially when in contact with the greenstone porphyry. Its prevailing colour is a dark blue; it is, however, not unfrequently black with white veins, yellow, red, white, and gray.

must grant the animals carbonate of lime with which to construct their shells and solid habitations. This they may have obtained either in their food or from the medium in which they existed. The marine vegetables are not likely to have supplied them with a greater abundance of carbonate of lime at that time than at present. Those that were carnivorous might acquire much carbonate of lime by devouring other animals more or less possessed of this substance: but the difficulty is by no means lessened by this explanation; for the creatures devoured must have procured the lime somewhere. It would appear that we should look to the medium in which testaceous animals and polypifers existed, for the greater proportion, if not all, of the carbonate of lime with which they constructed their shells and habitations. Now, if we consider the mass of limestone rocks to have originated from the exuviæ of marine animals, we are called upon to consider that carbonate of lime was once far more abundant in the sea than we now find it, and that it has been gradually deprived of it. This supposition would lead us to expect, that as the sea was gradually deprived of its carbonate of lime, limestone deposits would become less and less abundant; and consequently, that calcareous rocks would be most common, when circumstances were most favorable, that is to say, during the formation of the older rocks. This, however, is precisely the reverse of what has happened. Hence we may infer that the origin of the mass of limestone deposits must be sought otherwise than in the attrition or solution of older and stratified rocks, or from the exuviæ of marine animals deriving their solid parts from a sea which has gradually been deprived of nearly all its carbonate of lime. Both these causes may have eventually produced important modifications on the surface of the earth; but the great proportion of lime necessary for the formation of the calcareous masses covering a considerable part of it, would appear to have been otherwise obtained."

Some portions of this rock are thickly studded with fossil remains, though speaking of the formation generally, they are not very abundant; they consist, for the most part, of madrepores and corallines, with *testacea*, *crustacea*, &c. *Posidonia* have been obtained from Drewsteignton, and fossils of several genera, including trilobites and a portion of a fish jaw, have been found at Doddiscombsleigh. The curious mamillary concretions of silicious matter, named Beekite, occur about Torquay and Churston Ferrers. I believe that no probable conjecture as to their origin has yet been hazarded.

The chief masses of the limestone formation that occur in this district are those of Denbury, Whilborough, Marldon, Babbicombe, Kingsteignton, Chudleigh and Drewsteignton: it is found in less quantity at Doddiscombsleigh and under Haldon, to the northwest.*

The geological position of these masses of limestone appears to be that of beds alternating with, and deposited in, the slate formation: though found in connexion with some of the trap family, yet these latter always appear to have been thrust into apposition by violence, and are therefore not naturally associated with them. When the traps and limestone

* Mr. Austen refers the limestone under Haldon, as also that at Chudleigh, to the lowest band of this formation. (Vide Athenæum, Feb. 24, 1838.)

thus come into apposition, changes are frequently observed to take place in both—the limestone becomes more highly crystallized, and the trap rocks assume (though but very rarely) a character not unlike serpentine. In the Drewsteignton quarry numerous thin strata of carbonaceous rock and limestone alternate with each other. These are bent and folded in various directions. "Were we to take a number of alternating sheets of black and brown paper, and fold them nearly round a wine decanter, and then bend them back over the lower folds, we should have a not inapt representation of the singular contortions of the strata in this place." At Blackhead, Babbicombe, the greenstone appears to have been erupted through the lime, in one place overlying it, and in another situated beneath it. The junction of the limestone with this trappean rock may also be observed at Doddiscombsleigh. At Chudleigh it is found imbedded and intermingled with the red sandstone and conglomerate.

Bone caverns occur in the Babbicombe and Chudleigh limestone rocks very similar to that at Kirkdale, described by Dr. Buckland.* The floors of these caverns are covered with a mixture of calcareous deposit and clay conglomerate, in which the bones are imbedded, and this is again covered over with a thick layer of stalagmite.

* Reliquiæ Diluvianæ, p. 8.

NEW RED SANDSTONE. The new red sandstone is a rock which differs, in many respects, from those hitherto described, and which were shown to be more or less crystalline in their structure, and to have their beds, with the exception of the granite, highly elevated, whilst the new red sandstone possesses neither of these qualifications. This formation is composed, for the most part, of nearly horizontal beds of loose fine-grained sand, passing by various degrees of hardness into compact sandstone, clay, marls, and conglomerate.

The conglomerate part of the red sandstone, in its general aspect, is a dark red, passing into a dusky brown. It is composed of various sized masses of angular limestone, grauwacke slate, flinty slate, trap rocks, and quartziferous porphyry,* cemented together by an argillaceous paste. The separate masses of the conglomerate are of the greatest magnitude in

* "The component parts, or rather the mineral contents of the more recent portion of this formation are various: remains of granitic, porphyritic, and grauwacke rocks, form a considerable part of the imbedded fragments; crystalline, semi-vitreous, and earthy felspar, of a reddish brown colour; quartz; common schorl, (occasionally this and the last are met with distributed in small contemporaneous veins, apparently crystalline); chlorite; brown manganese ochre in occasional cavities; calcareous spar; and limestone (occasionally with coralloid remains.) All these are for the most part mixed promiscuously in the same stratum; occasionally particular substances predominate, but seldom, if ever, to the total exclusion of all others; the quartzose and porphyritic fragments are but slightly rounded—in some cases not even perceptibly so; the calcareous portions have usually the appearance of being worn by attrition." (Mr. Kingston.)

those parts of the rock which more nearly approach the older series; and although many of these masses are partly composed of the traps which occur in the neighbourhood, yet they also contain in abundance red quartziferous porphyry, which has not been observed *in situ*.* It should also be observed, as a

* "The presence of these porphyries in the red conglomerate of South Devon is remarkable, inasmuch as, though rolled, masses of the same kind are not observed unconnected with the red conglomerate of the same country. The absence of such rocks on the exposed surface is certainly no proof that they may not be near; for when we consider the area covered by the red sandstone series in that district, there is ample space for the abundant occurrence of such rocks beneath the sandstone; and there are also many unexplored situations, where they may yet be detected among the rocks now uncovered by the sandstone series. The student must be careful not too hastily to generalize on such facts as have been above noticed in Devonshire, for the appearances may be more or less local. When, however, we extend our observations, we find that conglomerates are very characteristic of deposits of the same age in other parts of Britain, France, and Germany, and they most frequently, though not always, rest on disturbed strata. As we can scarcely conceive such a general and simultaneous movement in the inferior strata, immediately preceding the first deposits of the red sandstone series, that every point on which it reposes was convulsed, and threw off fragments of rocks at the same moment, we should rather look to certain foci of disturbance for the dispersion of fragments or the sudden elevation of lines of strata, sometimes, perhaps, producing lines of mountains, in accordance with the views of Elie de Beaumont. The accumulation of the larger fragments, and the relative amount of conglomerate, would, under this hypothesis, be greatest nearest the disturbing cause; and amidst such turmoil we might anticipate the occurrence of igneous rocks thrown up at the same period. If we return for the moment to that part of Devonshire with which we commenced these remarks, we shall observe facts which seem to afford support to this view; for where the conglomerates are abundant, there is no want of trappean rocks in the vicinity, such as various greenstones and por-

fact of some importance, that the red conglomerate does not in any way appear to be composed, or to

phyries, which have cut and broken through the slates, limestones, and other older rocks, in various directions: and I had recently an opportunity of observing, that red quartziferous porphyry, precisely resembling some of that which occurs so abundantly in rolled fragments in the red conglomerate of the district, is found in mass among the lower portion of the latter, and even (at Ideston, near Exeter,) surmounts a portion of it. But notwithstanding the abundance of the greenstones and dark-coloured porphyries, not a fragment of them has yet been discovered among the conglomerates, though rolled portions of the red porphyries are so abundant: and it should be observed, that good sections are by no means rare, particularly on the coasts. This fact seems to attest that the dark-coloured trappean rocks did not exist in such a state, when fragments of slate, limestone, &c. were broken off, that they could be fractured and broken with the rest; though it does not show that trap rocks may not have been protruded at the time of the convulsion, thus aiding the confusion, and in a great measure causing it. On the contrary, we have every reason to consider that the eruption of trap rocks did accompany, if partly not produce, the disruption of strata, whence the fragments in the conglomerate were derived: for we have seen that red quartziferous porphyry, in mass, surmounts a portion of the red conglomerate; and the occurrence of trappean rocks (principally of a red or brown tint, and containing much silicious matter,) so blended with the conglomerates that lines of separation cannot be drawn between them, is by no means rare in the district, (Western Town, Ideston, and other places in the vicinity of Exeter.) Now if igneous rocks were ejected—a conclusion which the facts appear to justify—at the time of the production of the conglomerate, there would seem no reason why, under favorable circumstances, the two should not be in some measure blended with each other. Another circumstance also lends probability to this view, and that is the occurrence of pebbles cemented in certain inferior beds, (well observed on the coast and inland between Babbicombe Bay and Teignmouth, at the Corbons, Torbay, in the vicinity of Exeter, and other situations,) by a kind of trappean paste, containing crystals of that variety of felspar named Murchisonite by Mr. Levi. Such a cement might possibly have resulted from the upburst of igneous rocks, accompanied by various

contain portions, of the dark-coloured porphyries which are rocks of the neighbourhood.

The extent to which this very interesting formation is quarried, or naturally laid open to view, enables us easily to study it. The line of junction, between this and the slate, passes through the north-western side of Exeter. Between the Engine Bridge and the Head Weir the mill leat is bounded on one side by a high rock, chiefly composed of grauwacke and carbonaceous slates, crossed by numerous veins of white quartz, and which may be conveniently examined at the weir. From this it extends down the river to a line drawn from the bottom of Fore street to Little Barley House, where it meets with the red conglomerate. The nature of this conglomerate, the direction and dip of its strata, and the differences which exist between it and the schist may be investigated at the Quay. The Heavitree and Exminster quarries, from their vicinity to Exeter, offer excellent opportunities for studying this formation in detail. The following is Dr. Berger's excellent description of the former quarry:

"The quarry of Heavitree is situated about a mile and a half from Exeter, on the road to Honiton. It

gases beneath a mass of water, when some of the erupted matter may have so combined as to form a cement, in which crystals of Murchisonite became developed: without some such hypothesis this cement seems of very difficult explanation." (De la Beche.)

is worked to the extent of a quarter of a mile in length, and to the depth of about ninety or one hundred feet, in a plane intersecting that of the strata. The rock worked in this quarry is a conglomerate evidently stratified; the strata are from six to eight feet in thickness, and dip south-east at an angle of about 15°. As long as this rock preserves the character of a conglomerate, it is compact and tenacious, and, according to the report of the workmen employed in the quarry, hardens by exposure to the air, but as soon as it passes to the state of an arenaceous stone, becomes tender and friable. It is very common to see blocks of it in this last state, and sometimes of a great size, included in the middle of the conglomerate. The cement of this rock is argillo-ferruginous, and by itself does not effervesce with acids; but it produces so brisk an effervescence from the calcareous particles that are intimately mixed with it, that it might be very easily mistaken for limestone. The substances which enter into the composition of this conglomerate are numerous; it may first be remarked, that these are of very different sizes and forms, sometimes rolled and rounded, sometimes pointed with sharp angles, from very minute grains, to the size of several inches in diameter. There are found in it rhomboidal crystals of calcareous spar; felspar, most frequently of an opaque white, and decomposed; silicious nodules; grauwacke; yellow-

ish limestone; rolled masses of a sort of porphyry, which somewhat resembles the antique, having a base of a reddish brown colour, not effervescing with acids, and containing numerous small and well-defined crystals of felspar imbedded in it; pieces of a rock which is itself compounded, having the appearance of a porphyry, the base earthy, and including small grains of quartz, crystals of felspar, and pieces of blueish carbonate of lime, together with a whitish tender steatite, in small angular fragments."

In no locality, however, is this formation laid so extensively open as* from Babbicombe to Branscombe. The rocks of this coast consist entirely of the red conglomerate, which may here be examined in all its varieties. Between Pettytor and Teignmouth it is seen frequently occurring with limestone and schist, and at Babbicombe with greenstone. †

Near Teignmouth and Dawlish large masses of a

* "In noticing the structure of the new red sandstone, the chief subdivisions of the formation present the following geographical arrangement, proceeding from east to west:—1. Marls, with gypsum as far as Sidmouth. 2. Sandstone from that town to a little beyond Exmouth. 3. Shingle and conglomerate to the western boundary of the formation, the pebbles, derived from the adjacent older rocks, increasing in size towards the edge of the deposit; and from this distribution, he inferred, that the conglomerate marks the original shore of the sea in which the new red system was deposited; the sandstone, the fine detritus carried in a certain distance from it; and the marl, the mud diffused through the water, and conveyed to a still greater distance." (Notice of Mr. Austen's paper read at the Geological Society, vid. Athenæum, p. 152, Feb. 24, 1838.)

† Vide p. 177.

more indurated structure present themselves; these, as the surrounding sandstone is washed away, retain their position, or fall outwards upon the beach. They are available for building material, and are particularly interesting from containing quartziferous porphyry in large quantity. This indurated and conglomerate character of the rock invariably decreases as we leave the district in which the trap and older series occur. Some of the conglomerates are sufficiently calcareous to admit of their being burnt for lime. One instance of this is near Oakford Bridge, south-west of Upton Pyne; and near Pinhoe, a rock of a somewhat similar kind is quarried.

At Exmouth, where the rocks face the sea, there are two remarkable beds of whitish sandstone, extending nearly from the top to the bottom of the cliff: near the bottom a considerable dislocation has taken place, and portions of the beds appear to have fallen, and are found under the sand of the shore in a nearly horizontal position.

In many places this conglomerate is crossed in different directions by veins of a more durable nature than the general mass of the rock itself; this latter decaying on exposure to the atmosphere, leaves the projecting hard veins; thus various curves and hollows are formed, which give to the rock a honeycombed appearance. These veins, where they approach the older rocks, are mostly composed of sand and iron agglutinated together, but in the

vicinity of the chalk formations they consist of calcareous spar.

The loose sand varies in colour from the brightest red to white, and is composed of very differently sized grains: these are partly silicious and partly decomposed felspar; and so far as these, which are its essential components, are concerned, does not effervesce on the addition of acids. There is, however, in many districts the accidental admixture of carbonate of lime, which offers this reaction, and might mislead those unacquainted with the true composition of the red sand formation. The compact sandstone, which, for the most part, occurs in shallow beds under marls, &c., is of a dirty yellow colour, occasionally stained in some places black, but most generally tinged red by oxide of iron. It is coarse grained, and available for many purposes. In the immediate neighbourhood of Exeter it is rarely sufficiently compact for millstones.

The clay in colour is a dirty red, and is chiefly argillaceous, frequently passing into a friable sandstone of the same character. It occurs in beds, and is very available for brick-making.

The marls are of different colours, and in every respect appear to be identical with the variegated marls of the district of the Vosges,* as minutely de-

* De la Beche, when speaking of the variegated marls, says: "Where seen on the southern coast of England, between Lyme Regis

scribed by Elie de Beaumont. They present colours of a wine red, and greenish and blueish gray, with thin beds of black slate clay, and of quartzose sandstone, nearly without cement. They break into fragments, which have nothing of a slaty structure. Amongst the marls, west of Budleigh Salterton, there occurs a bed of loose pebbles, seventy feet thick, of extremely hard silicious rock, much waterworn.

About half a mile to the east of Broadclist, a quarry of sandstone is now working, in which the above varieties of this formation may be well studied. On the surface we observe the soil composed of the disintegrated rock; immediately underneath, a loose coarse-grained red sand; then a layer of almost black sandstone, which, on drying, appears composed of small dark coloured grains, without the admixture of any cement; below this are several layers of various coloured marls lying upon horizontal beds of a compact dirty yellow sandstone, and which is being worked for the purposes of flooring, &c.

Though this formation is nearly horizontal, yet there is a general dip towards the east, rendered

and Sidmouth, the upper part of the red sandstone series is so like the variegated marls of the Vosges and parts of Germany, that I have little hesitation in considering them contemporaneous deposits. In this part of England these marls contain vegetable remains, and, though rarely, scales of fish, and bones of pterodactyles (?) According to M. Rozet, the upper part of the variegated marls contains the teeth and bones of saurians, with *Pectines* and *Entrochi*."

irregular by the numerous faults that intersect it; and many of the beds being subordinate to the whole, dip at very different angles, and in as many directions. We not unfrequently find between two layers which are horizontal, an intermediate one with a dip almost perpendicular, and in other places the beds assume a waving and even a circular direction:—in fact, there appears to be no variety of position to which this red conglomerate formation is not subjected. The composition of the adjoining layers is frequently very different, some being of a fine sandstone, some a stony conglomerate, some of a bright red, and others a dusky yellow, &c. Sir H. De la Beche argues from this, that there must have been great variety both in the force and direction of the currents in which this formation was suspended before it was deposited.* The line of sea-coast, from

* "It may be right, while on the subject of these Devonshire conglomerates, to adduce evidence of the unequal action of currents of water, in this vicinity, at the same period. There is perhaps no situation where better examples of this can be observed than on the line of cliffs between Babbicombe and Exmouth. The alternations of conglomerates and sandstones at the upper part of the conglomerate series are very frequent, more particularly in the vicinity of Dawlish; showing that the water had sometimes the power of carrying forward rounded fragments of the size of the head and even larger, while at others it merely accomplished a transport of sand. Not only do the alternations exhibit this difference in the velocity of water, but the structure of the beds themselves shows that the directions of the currents have continually varied. Amidst sandstones and moderately sized conglomerates on the west side of Little Haldon Hill, there are blocks of quartziferous porphyry, generally rounded, of a ton or more in weight. Being scattered on the side of the hill, they might be mis-

Torbay to Sidmouth, affords the best sections of these strata, and others may be seen inland. Between Kennford and Haldon, a part of the conglomerate is exposed, where it rises rather rapidly, and terminates abruptly at the edge of the hill against the green sand. Sections of the subordinate layers of sand, &c. may be examined at the sides of the roads, and in sand pits, from Exeter to the neighbourhood of St. Mary's Clist, Broadclist, &c.

Faults in the beds of this formation are very frequent. A circumstance attending these is well worthy of observation: one portion of the layer of the rock is raised perhaps four or five feet above that which corresponds and was originally joined to it; the summits of both portions are then covered by a loose stone rubble, which is again surmounted by a layer of red sand; neither this latter nor the loose stone rubble are affected by the fault, but occupy the broken summits of the red conglomerate in horizontal and continued beds. This upper layer has been called a Regenerated Sandstone, but is nothing more than the matter left by the water, which denuded the surface of the strata. Examples of this

taken for superficial erratic blocks, did we not find them in their proper situations on the sea cliffs, imbedded in the mass of rock. The transport of these must have required water moving with considerable velocity, so great, possibly, as to grind down by attrition against each other, the rock fragments of inferior hardness, while the pieces of quartziferous porphyry, being exceedingly hard and of very difficult fracture, have better resisted attrition."

may be seen in many places: I may instance Langston Cliff, near Dawlish, and the hill near the four mile stone on the Stoke road. Very few fossils have been met with in this formation within the district here spoken of. A quarry at Broadclist, half a mile north-east of the church, has yielded some specimens of ripple-marked stones, tracings of annelides, the clawlike feet-marks of two species of small crustaceans, and obscure impressions of other objects. The singular concretionary masses found near Pinhoe, and others in the cliffs at Exmouth, require further examination to determine whether they are casts of organized bodies, or simply mineral concretions. It is said some portions of fossil vegetables have been found in the marls near Sidmouth.

The red sandstone of this district lies upon the carbonaceous rock, excepting in some instances where limestone or trap intervene; and it is covered by the green sandstone.

On sinking wells in Exeter, the red sand is met with to a depth varying from ten to fifty and even eighty feet, and then afterwards the carbonaceous rock. Its passage under the green sand may be easily seen on ascending any of the green sand hills in the vicinity, as Haldon, &c.

The soil of the conglomerate districts is generally dry and fertile, and when the sands have a sufficiency of more compact materials mixed with them, their productive quality is good. In some parts the

marls are firm and retentive and consequently suffer much from excess or deficiency in the supply of rain.

GREEN SAND. The green sand formations of this district consist of beds of sand, sandstones, and chert, of very various colours and compactness. The prevailing colour is that of a light green, which is chiefly owing to the presence of chlorite. Masses of this formation are, however, met with of other colours, as light dusky yellow, brown, red, &c. The basis of the green sand is argillo-arenaceous; and it contains mica and a large variety of fossil remains.* In the chert, which is of common occurrence on Haldon, both the mica and chlorite are wanting.

Though the general character of the green sand in the neighbourhood is that of a loose and slightly-adhering compound, yet in some places it is sufficiently consistent and hard to be available as fire and whet stones. In this latter state it is found on the eastern side of Haldon.

The geological position of the green sand is between

* "Its characters are chiefly that of a fine-grained sand of various texture, from a friable character to a compact silt, and all more or less coloured by chlorite: it frequently contains nodules of gypsum, and abounds with fossil remains, chiefly univalve and bivalve shells. Incumbent on this formation, both on the summit of Milburn Down and the other hills, are strata of chalk flints. These beds were probably continuous also with those of Black Down to their termination in Dorsetshire, where they are incumbent on the chalk. Polypiferous remains and echinæ are of common occurrence amongst them." (Kingston.)

the red conglomerate and chalk; it rests upon the former, and is surmounted by the latter. It occupies the summits of the Haldon, Sidmouth, and Blackdown hills, as also the tabular ridges between the Otter and Axe rivers. On Haldon hill rolled flints, identical with those of the chalk formation, lie upon the green sand; and on the Sidmouth hills there is a superficial detritus of chalk.*

Mr. Austen thinks that the green sand of the Haldons has been elevated by the action of a subjacent mass of trap, portions of which, he says, are visible at the extremities of the hills; and he is of opinion that the preservation of these insulated patches of green sand has been owing to their having been raised above the level of the waters which denuded the surrounding districts.

Bovey Clay and Coal. These very curious and interesting formations consist of various layers of clay and coal surmounted by a bed of gravel.

The clay is of different degrees of purity, consist-

* "In south-western England the chalk rests on a great arenaceous deposit somewhat variable in its composition, sometimes containing thick regular seams of cherts, at others being nearly without them; the other portion being very generally an argillo-arenaceous deposit, characterized by the presence of a great abundance of green particles, and a great variety of organic remains. The central part is formed of yellowish-brown and loosely aggregated sand, in which organic remains are rare; the superior, of a mixture of brownish-yellow and green sands, with and without chert seams, the organic remains being frequently fractured." (De la Beche.)

ing chiefly of what is technically called crackling, potter's, and pipe clay, and is deposited horizontally in five undulating beds of various widths: the two most westerly are the crackling, the two next or middle, the potter's, and, the most easterly, the pipe clay; this last lies considerably thicker than either of the others. These several layers of clay alternate with, and run parallel to, as many deposits of sand and gravel, which occur in beds of from fifty to a hundred feet in depth; the clay is rarely found of good quality nearer the surface than thirty feet. Both it and the intervening gravels are apparently formed of debris from the granite hills to the westward, the quartzose portion forming the gravels, and the decomposed felspar, the clay.

The coal is a deposit of lignite, and evidently consists of dicotyledonous trees, imperfectly mineralized; it varies from charred wood to the more perfect structure of pit coal; it is brownish and black in colour, strongly impregnated with bitumen, light and friable in texture, and easily separable into irregular laminæ, especially after exposure to the air, when it becomes schistose in appearance: it occurs beneath the four layers of potter's and crackling clay, in stratified beds, which occupy altogether a space of seventy feet in thickness. Near the Bovey pottery, where the largest body of it appears to be situated, it approaches to within five or six feet of the surface, and dips at an angle of about 24°

or 25°. The coal is also found mingled with the clay in detached pieces, somewhat resembling reeds and grass.

Amidst the clay, but adhering to the coal, small masses of retinasphaltum are occasionally met with; it is externally of a pale brown ochraceous yellow and earthy appearance, but when broken exhibits a slight resinous lustre; is extremely light, soft, and easily frangible, the fracture is imperfectly conchoidal; it is inflammable, and during combustion emits an odour somewhat aromatic.

The crowning bed of gravel, or "the head," as it is locally called, varies from five to twenty feet in depth, and is composed of quartzose sand, and portions of rock from the immediate neighbourhood, mingled with clay, apparently similar to that of the deposit beneath.

These formations occupy a large natural basin,* caused by the destruction of the chalk, and great portion of the green sand, which, doubtless, previously existed there; it is of an irregular lozenge form, chiefly situated in the parishes of Bovey Tracey, and Teigngrace, and extends itself in a narrow strip towards Teignbridge, and thence across the Teign, by Newton to Aller Mills, at the base of

* The surface of this basin is known by the name of the Bovey Heathfield, and is at an average height of fifty feet above the low water sea level; near its south-eastern corner borings have been sunk through the layers of clay to the depth of two hundred and twenty feet, in an unsuccessful search for black coal.

Milber Down. The length of this basin from its north-western to its south-eastern extremity, is about eight miles, and its breadth from its north-eastern to its south-western, about four miles.

There is some difficulty in fixing the exact time at which these formations were deposited, it is not improbable, however, that it was about the conclusion of the supercretaceous period, for though older than the gravels that surmount them, yet they are evidently more recent than the neighbouring formations, as they not only follow in their boundaries the general arrangement of the surrounding hill and dale, run up the valleys, &c., but, according to Mr. Austin, the "green sand flanks the valley of the Bovey, and probably forms the lining of that lignite basin."

The clay is used extensively, the potter's and crackling, according to their fineness, in the manufacture of porcelain and coarse earthenware, and the pipe clay, (which is unfit for the potteries, from the quantity of iron it contains,) in the making of tobacco pipes. It is worked in open pits of various depths, from thirty to forty feet, where it is cut into cubic or prismatic lumps weighing about thirty pounds each, technically called clay junks, it is then dried in cellars and exported.

The coal is to a certain extent serviceable for fuel, though its general adoption is precluded, not only from the imperfectness and difficulty with which it

burns, but from the offensive bituminous odour emitted during combustion. It is, however, used in the local potteries, and by the cottagers in the neighbourhood.

GREENSTONE. The greenstone of this district appears to be of that kind which modern geologists have termed granitic, to distinguish it from the greenstone of the trap family, with which it has been confounded. This group is supposed by Sedgwick and Murchison to be metamorphic.

It is a true granitic compound, consisting of felspar and hornblende: the felspar is sometimes red, sometimes white—when red, the greenstone has a reddish colour—when white, the mixture of white and blackish green hornblende gives a greenish hue to the stone, whence its name. In many instances it is found passing through the schist and rising to the top of the hills, where its durable character often makes it conspicuous. Good sections, where it divides the carbonaceous rocks, are exposed to view on the west bank of the Teign, in the neighbourhood of Christow, Trusham, and Ashton. In the same district, and also at Doddiscombsleigh, it may be seen protruding itself through the strata to the top of the hill.

A remarkable mass of greenstone, very fine grained, with an increased proportion of hornblende, is found penetrating through a high hill at Hennock, called

Botter Rock. At first sight its masses have somewhat the appearance of being regularly crystallized; but, on examination, this is found to be nothing more than the irregular forms into which this rock separates. It varies considerably in appearance, according as the hornblende or felspar predominates, and according to the coarseness or fineness of its texture.

In the greenstone under Hennock is a copper and lead mine; the galena, white-lead ore, and copper, are all good. It is also connected with an extensive superficial stratum of sulphate of barytes, which extends a distance of two or three miles. Manganese occurs abundantly at Ashton, Doddiscombsleigh, &c.

Trap Rocks. Those of this district are all either claystone or clinkstone, and are in considerable repute for the various purposes of building, &c., almost the whole are quarried, hence their nature and situation may be easily studied.

The first or most southern mass of this rock lies immediately behind Haldon House, where it emerges from under the green and red sandstones; it extends thence through Dunchideock to a hill north-west of the village where it terminates. It is quarried behind Haldon House, at Dunchideock, and at the last-mentioned hill.

The second mass, which appears at Knowles Hill, is separated from the former by a deep valley

of schist: it runs down to Ide, and thence to Pocombe. It is quarried at Knowles Hill, at Western Town near Ide, and at Pocombe.

The third mass is the hill on which the Castle of Exeter stands, and is the well-known Northernhay rock. Heretofore it has been extensively quarried. Its boundaries are as follow: From the brook opposite the back of the Castle, it crosses the field east of the county jail to Hill's Court, turns towards the Old London Inn, passes along Southernhay to the middle of the cathedral yard, crosses Fore street and St. Paul's street, and then through the garden at the western extremity of the Northernhay, returns to the brook.

The fourth mass is met with about three miles on the Broadclist road, opposite the entrance to Poltimore; thence it extends about half a mile down the Clyst river. These two latter masses are of small extent.

The fifth mass is by far the most extensive: it first appears near the road leading from Broadclist to Crabtree, and passing through Killerton Park towards the river, which it crosses, terminates some way beyond Thorverton. It is quarried in various situations, and the quarries obtain the names of the places near which they are wrought, or of the owners of the rock.

The sixth mass is at a place called Knowles, two or three miles beyond Crediton, near Cotford. At

Posberry there is another mass, and scattered about many others of less note. These rocks, though presenting some slighter differences,* are not essentially dissimilar in their composition; that which I have more particularly examined is the Pocombe rock, in the immediate neighbourhood of Exeter. It is an indurated claystone, containing minute particles of quartz, has no stratification, and consequently the broken fragments assume no particular form, though the fracture of the more indurated portions, which are somewhat uniform in their structure and appearance, is sometimes conchoidal: in this state it appears passing into clinkstone:—this is seldom found at Pocombe, but is met with at Knowles, above Ide, and in the valley below Dunchideock. The various appearances which this rock assumes in different parts of the quarry render it easily and usefully divisible into veined and vesicular: in both these varieties, which are much intermixed, the nature of the base is the same, namely, claystone with minute particles of quartz. The veins are of several kinds, and of different sizes. At Pocombe Hill, one series of small veins may be seen to have a waved course, slightly inclined in an easterly direction; nearly at right angles, are others,

* The differences of Doberry Hill are rather more marked: it is hard and compact, gray in colour, and crowded with small glistening plates of mica; this rock belongs essentially to the clay trap family, but apparently has not been subjected to a temperature sufficient to fuse its mica.

fewer in number, and less clearly marked. Veins of clay-stone, of a finer texture, and of a larger size, are occasionally found filling the cracks in the rocks, usually approaching a perpendicular direction, and often containing broken and isolated fragments of the rocks. Open fissures or divisional lines, more or less general, also occur, of which those in a few particular directions are much more continuous than the others; in twenty-seven observations, at the different localities above mentioned, fourteen of these lines were found to range north-north-west, seven between west-north-west and west-south-west, three south-west by south, two south, and one south-west.

Small vesicles frequently occupy portions of the rock. These vesicles are sometimes filled with various substances, occasionally they are empty, and give the rock a honeycombed appearance; they are nearly spheroidal, and seldom contain crystallized substances, differing in this respect from claystone porphyry.* When the spheroids are considerably extended in one direction, approaching to the shape of an almond, the rock has obtained the name of an amygdaloid. In a quarry north of Rew, at the junction of the Silverton and

* "Some of the rocks of this family are not unfrequently vesicular, in the manner of modern lavas, the vesicles however being generally filled up by some mineral substances which have since been infiltrated into them. Such substances are not unfrequently agates, and those employed in the arts are principally thus employed." (De la Beche.)

Tiverton roads, the vesicles are well worthy of examination; in many instances they are ranged in lines from one to six inches thick, with compact trap above and below them, and in others, congregated in collections of a cylindrical form, in a perpendicular direction, and also surrounded by compact trap. The following are some of the substances met with in these cavities: indurated clay, lithomarge, green earth, indurated clay surrounding calcareous spar and rhomboidal brown spar, mica, carbonate of copper, steatite, &c.

The geological position of these traps is between the carbonaceous rocks and the new red sandstone; through the former they have evidently been obtruded, while in the latter various portions of them are frequently to be met with,* so that their appearance in their present position must be considered as subsequent to the deposit of the carbonaceous rocks, but anterior to that of the new red sandstone.

These rocks are generally useful for the purposes of building: under water they are excellent, resisting its action almost equally with any known stone; when exposed to the variations of the atmosphere, that portion which is veined with calcareous spar decays soonest; the spar, losing its water of crystallization, disappears, and the masses of rock contained between the veins crumble to dust: where

* Vide antea, p. 179.

the veins are quartz the durability is much greater; these resist a long time the action of the atmosphere, and bind firmly together the masses of claystone which they inclose; but the most durable part of the rock is that which at first sight one would not be inclined to select, viz. the vesicular portion whose vesicles are generally empty: it bears the tool, and can be wrought. In examining the older buildings of the district where this rock has been employed, it will be found that the faces and edges of stones taken from the vesicular part are sharp and perfect, whilst the veined stones are somewhat decayed. Probably this portion may have undergone a degree of vitrification.

GRAVELS. Overlying the strata already described are extensive deposits of waterworn materials, the debris of earlier formations.

On the top of Haldon we find flinty substances containing chalk fossils; many of these masses have their angles ground off, and others appear uninjured: with them also are rounded pebbles, composed of quartz, of quartz with schorl or hornblende, hard silicious slate, trap, sand-stones, chert from the green sand, and, mixed with the whole, whitish clay: this stratum has by some geologists been referred to the age of a part of the plastic clay series, which gives it an antiquity greater than that of the other gravels here mentioned.

The gravels from the Otter to the Teign appear to be derived from those rocks, over which the present rivers and their tributaries flow; near the Otter green sand chert is abundant; along the range of Woodbury hill, and some way to the west of it, pebbles of the new red sandstone are almost exclusively found; farther west these occur, mixed with green sand chert; towards Exeter fragments of the carbonaceous and trap rocks are the most numerous; and in the valley of the Teign, granite, trap, and carbonaceous rocks are almost the only kinds to be noticed.

These gravels are all above the highest floods of the present streams, and must have been deposited by some cause not now in operation. We are not aware of any fossils having been discovered in them; unless the marine shells said to have been found within the valley of the Exe are so situated.

At lower levels, where the present waters may be supposed to have extended, deposits of gravel, sand, &c., are found. In one of these, where the Exeter harbour has been made, a portion of a large deer's horn was dug up.

The gravels afford useful materials for road-making, and they greatly assist in the drainage of the surface soil.

VALLEYS. They are for the most part valleys of denudation, generally of the class called lowland,

and do not form with their bounding hills undulations of any very considerable extent; those of rather greater depth are provincially styled "coombes." An interest attaches to them as being those from which Professors Playfair, De Luc, and Buckland deduced their opposing theories of the formation of valleys generally. The view of Dr. Buckland, which appears to be the correct one, is, that they were excavated by the denuding force of a transient deluge,* and which evidently took place subsequent to the period that the earth was inhabited by hyænas, bears, elephants, &c., whose remains have been found in Kent's Hole,† and other caverns.

Hydrology. South Devon enjoys the advantage of rivers, streams, and springs, in abundance. Of the Exe and the Teign we have already spoken; the remaining rivers and streams are of minor interest, and present nothing sufficiently peculiar in their course, fall, or composition, to render it necessary to dwell upon them. I shall therefore pass on to a brief notice of some few of the natural springs, selecting those which will illustrate the general chemical characters of the waters proper to the different geological formations.

* Reliquiæ Diluvianæ, p. 238. † Vide antea, p. 177.

1st. WATERS OF THE NEW RED SANDSTONE. The conduit devoted to the public use of the inhabitants of Exeter, derives its source from two springs,* at the upper part of the parish of St. Sidwells. These springs yield, in three minutes and fifty-two seconds, an imperial hogshead of water, which is collected, and conveyed by pipes to a cistern recently removed to the western quarter of the city, opposite the eastern entrance of the lower market; as also to a cistern, in the cathedral yard, for the private use of the chapter. The water is clear, transparent, tasteless, and inodorous: specific gravity 1002; temperature, 53°; contains free carbonic acid, muriate of lime, sulphate of lime, carbonate of lime, sulphate of alumina.

Parker's well, situated in the parish of St. Leonard, together with several others of the neighbourhood, does not essentially differ from the above, which may therefore be assumed to be the general character of the waters issuing from the new red sandstone. A spring, however, near Thorverton presents some little difference, chiefly in containing a small quantity of soda: it is composed of carbonic acid, muriate of lime, muriate of soda, sulphate of alumina, sul-

* This supply of water is very ancient; Jenkins wrote more than a hundred years ago, that, "the great conduit at Carfoix, venerable for its antiquity, which had been standing nearly three hundred years, and had often poured wine to the rejoicing citizens, now fell a victim to modern improvements."

phate of soda (a small quantity), sulphate of iron (a trace).

2d. WATERS OF THE TRAP FORMATION. The water of a well in the cathedral yard, is sparkling, clear, transparent, inodorous, and slightly styptic to the taste: specific gravity 1003; temperature 52°; contains free carbonic acid, muriate of iron, muriate of lime, sulphate of lime, sulphate of alumina, carbonate of lime.

3d. WATERS OF THE SCHIST FORMATION. The springs that I have examined are those of Cleve, Whitestone, and Perridge; though they possess certain general characters, yet they differ somewhat in their composition.

Cleve spring. Specific gravity, 1002; temperature, 51°·5′; contains free carbonic acid, sulphate of iron, muriate of iron, carbonate of iron, sulphate of lime, sulphate of alumina.

Perridge spring. Specific gravity 1003; temperature 52°·5′, contains, free carbonic acid, muriate of iron, sulphate of iron, carbonate of iron, sulphate of lime.

Whitestone spring. Specific gravity 1003; temperature 52°·5′; in its composition very similar to the preceding, excepting that the quantity of sulphate of lime is rather less.

On taking a review of these waters, it will be seen that those which proceed from the trap, and new red sandstone, do not essentially differ; the characteristic impregnations of each being muriate and sulphate of lime, with a small portion of sulphate of alumina. The waters of the trap contain a little muriate of iron, which is not to be met with in those of the new red sandstone; this is easily accounted for, by the latter being a deposit from the debris of older rocks, which have been broken down and washed by diluvial waters, so that the iron has been precipitated as an insoluble oxide, imparting to the strata its ferruginous tint. The waters from the purer springs of these formations, are clear, light, palatable, wholesome, and generally available for domestic purposes; but when the mineral impregnations are in excess, as is often the case,* they are hard, cause roughness to the skin, and lie heavy on the stomach, often occasioning slight symptoms of a dyspeptic character: these effects are somewhat obviated by boiling, the water then deposits a large proportion of its solid contents. As is generally the case with waters that contain lime, they are well adapted for brewing and distillation; the fermentation of worts is better effected by them, than by the soft waters, which prejudice, often at great expense, seeks for in preference.

The general character of the waters of the schist

* A well in Friernhay street, Exeter, for instance.

formation is that of being clear, sparkling, inodorous, styptic to the taste, and usually depositing, after a few days' exposure to the air, a quantity of ferruginous matter. These, though inapplicable to many domestic purposes, are generally wholesome. Some of them, from containing an excess of free carbonic acid, and a very large proportion of iron, are entitled to be called mineral waters of the class of the acidulous chalybeate, and when drunk fresh are eminently serviceable in many cases of general debility and indigestion.

The temperature of the above springs on being compared with that of the mean of the climate, will be observed to be a little higher; this slight excess appears to be general throughout the temperate zone, whenever the springs proceed from some depth below the surface, and which may therefore be concluded to be the case with those of this district.

Chapter II.

NATURAL PRODUCTIONS OF THE SOUTH OF DEVON.

The natural productions of a district are not only interesting in themselves, but, to a certain extent, illustrative of the climate, we shall therefore briefly notice those which appear of more prominent importance.

Zoology. Of horned cattle a great variety are bred, but the most interesting, as belonging peculiarly to this county, are the Devon cow and steer: they are considered by agriculturists as very valuable, and are much sought after in distant counties. The full-sized Devon cow, when fattened to its frame, weighs about nine score per quarter, and the ordinary average of the ox at five years old, and equally well fattened, may be rated at about thirteen score and a half per quarter: the meat is close grained, and excellent. The milch cows are kept throughout the year in the open fields, their milk being considered better under these circumstances. The average quantity supplied daily by the red Devon cow, is in summer fourteen quarts, and in

winter eight; five quarts of this milk yield eight ounces and a half of raw cream, seven ounces of butter, and two pounds nine ounces of pressed cheese-curd.

The sheep of Dartmoor, are of very small size; they afford what is commonly called the Ockington or Okehampton mutton, which is much esteemed; it is dark coloured, peculiarly close grained, and yields on cooking a deep rich modena red gravy; it has much of the shortness and flavour of venison. The other sheep, natives of Devon, are the horned Exmoor, the South Devon, and the Bampton Notts.

The ponies of Dartmoor, which there run wild, are very celebrated; they are not elegant in appearance, but sure footed, hardy, and in every way calculated for traversing the hills of this county. A large variety of this pony is the well-known Devonshire packhorse; these horses were much used for the conveyance of agricultural produce, when the roads were less accessible than modern improvements have made them; they were permitted to traverse the roads loose, in parties of different numbers, one horse invariably took the lead, followed by the rest at a rapid rate, up and down the shingly hills, and occupying with their unsightly packs (*Devonicé* crooks) nearly the whole width of the road.

Ornithology. The birds of this district comprise nearly all the varieties usually met with in

England.* Game of every description is reared, but not in the same abundance as in the northern counties, from the smallness of the inclosures affording insufficient cover.

Swallows and redstarts arrive about the first week in April, and leave the first week in October; swifts and flycatchers make their appearance early in May, the former leaves towards the end of July, the latter in September; the cuckoo is usually heard by the 15th of April; and woodcocks arrive early in October.

In the winter season numerous species of the duck tribe frequent the rivers. The wild swan (*anas cygnus*) is only an occasional visitor; amongst those which arrived in the winter of 1830, a few were found to be of that variety called the *anas Bewickii.*

The nightingale, which is generally supposed not to frequent Devonshire, has for some years past been heard about a mile and a half to the north of Exeter.

Icthyology. Fish in the greatest abundance frequent the coast. Opposite to Starcross, the oyster beds are very extensive; the oyster is large and good, though not to be compared with that upon the Sussex coast. The hake furnishes to the poor a

* For a detailed account I may refer to Bellamy's Natural History of South Devon. It may be observed, as an interesting fact, that the late Colonel Montagu chiefly pursued his researches on Ornithology in this county, and from it many of the specimens that he contributed to the British Museum were supplied.

plentiful and cheap food. In the proper seasons there is an ample supply of cod, turbot, brill, mullet, dory, salmon, trout, bass, whiting, mackerel, herring, sole, crabs, lobsters, shrimps, prawns, cockles, &c.

BOTANY. The indigenous phænogamous plants of Devonshire amount to about eight hundred. They are well described, and their localities given, in the *Flora Devoniensis*. The following are the relative distribution and numbers of the species belonging to each of the principal natural orders:

MONOCOTYLEDONES.

	Species.		Species.
Gramineæ	75	Aroideæ	8
Cyperaceæ	48	Asphodelæ	5
Junceæ	16	And referrible to eight other natural orders	13
Orchideæ	13		
Fluviales	10		

DICOTYLEDONES.

Compositæ	72	Chenopodeæ	15
Cruciferæ	44	Borragineæ	13
Leguminosæ	39	Primulaceæ and Lentibulariæ	13
Umbelliferæ	38	Geraniaceæ and Oxalideæ	14
Rosaceæ and Pomaceæ	36	Rubiaceæ	11
Labiatæ	35	Hypericineæ	9
Scrophularineæ and Orobancheæ	31	Sempervivæ	9
Caryophylleæ and Lineæ	31	Solaneæ	8
Corylaceæ and Salicineæ	28	Euphorbiaceæ	8
Ranunculaceæ	20	Papaveraceæ	7
Polygoneæ	18	And referrible to thirty-nine other orders there are also	113

The grasses form nearly two-thirds of the monocotyledons, and, together with the composite flowers, one fourth of the whole of our phænogamous plants; the cruciform, leguminous, umbelliferous, rosaceous, and labiated, form together one fourth more. Amongst the plants peculiar to this county the *chrysocoma Linosyris* and the *lobelia urens* are remarkable. The *primula veris*, and the *campanula rotundifolia*, of common occurrence in the adjoining counties, are but rarely met with. *Erica vagans* is chiefly restricted to the serpentine formation; *iris fœtidissima*, and the elm, are frequent on the red sand; the *cisti*, *climatis vitalba*, and *conyza squarrosa*, on the limestone; and the oak, on the schist formation. With these exceptions, and they must not by any means be taken in a strict sense, the distribution of the different species of plants appears to be quite independent of the various rock strata. The most striking local differences in the character of the Flora of the district, will be found in that portion, chiefly composed of granite and schist, which is elevated, and uncultivated, as contrasted with the more sheltered and reclaimed country on the red sand formation.

HORTICULTURE. The markets are supplied with the best sorts of vegetables, and in the greatest abundance: cabbages are produced by the beginning of April; and some of the early kinds of broccoli, in

favorable seasons, at Christmas, the principal crop however, does not come in till February or the beginning of March. Potatoes are frequently brought to market in the beginning or middle of May, but this is considered very early; they are not produced in any quantity until June. Turnips are in good table order by May. The seasons, however, vary considerably; asparagus, which is the surest test of temperature, has been gathered as early as the 16th of March, while in another year it could not be cut till the beginning of May.

Mulberries are fine, and occur in abundant crops; walnut trees of very good kinds, bear well. The cob nut grows in the greatest abundance; the filbert is rarely met with good, but this is mainly owing to want of care in its cultivation.

Nectarines, apricots, and peaches in good aspects produce fine crops, the fruit being large and well flavoured. Plum trees, against walls, bear fruit of very fine flavour, while standards, in open gardens, are uncertain. It is generally considered that there is something very obnoxious in this climate to the damson, and Devonshire people constantly affirm that it will not thrive in the county; this, however, is not the fact, as there are now many trees in the district producing fine fruit.

The apple tree, generally speaking, bears abundantly; there are a few exceptions, but these may probably be traced to the trees being worn out, or

to the orchards being badly managed. The best late dessert apples in cultivation, are, the Cornish gilliflower, the old nonpareil, the old golden pippin, and the Ross nonpareil; these last two are in perfection from the beginning of November to Christmas; the Cornish gilliflower from the middle of November to Christmas, and the old nonpareil, from Christmas to Lady-day. The earliest dessert apples are the Irish peach, early Margaret, and Jeanetin, which in favorable seasons are ripe in July.

The pear trees, to be depended upon for producing a regular crop, as standards, are the citron des carmes, jargonelle, white doyenne, beurre de Capiaumont, Napoleon, Chaumontelle, Bishop's thumb, glout morceau, swan's egg, Windsor, Catillac, &c.; in fact, a great variety of pear trees thrive well in this district, producing a thoroughly ripe and delicious fruit.

Little need be said with regard to shrubs and trees; all the British species thrive exceedingly well; the myrtle is luxuriant in the extreme, and frequently forms an ornament to the cottage garden; the cyprus and the cedar arrive at great heights, and the whole district is studded with elms, oaks, ilices, and firs, which grow in the greatest luxuriance.

Chapter III.

THE CIVIL AND ECONOMICAL HISTORY OF THE SOUTH OF DEVON.

In considering the character of the district, we have hitherto referred to circumstances, which for the most part are proper to it, and not capable of being materially altered; we shall now consider some of the more material of those whose origin is consequent on the social condition.

Occupations. The inhabitants of the rural parishes are chiefly employed in agriculture, while those of the towns are artisans. In some places there are extensive lace manufactories, but these are not so numerous as to give a character to the population. Exeter, the principal market of the district, was formerly a great emporium for the thinner kinds of woollen goods, such as serges, druggets, estamines, and long ells, which were spun and woven in the towns around, and then dyed and finished within the city; whence they were shipped to Holland, Italy, Spain, and the East

Indies. The serge manufactory, which a few years since was of much importance, is now nearly extinct: when the woollen trade was in its greatest prosperity, it was estimated that eight out of ten of the labouring population were engaged in the various departments of its manufacture, now there are but a very limited number employed in the few fulling mills yet at work. Since the introduction of machinery, and the greater facilities for obtaining fuel in the north of England, this trade has been for the most part removed thither. The trade of Exeter is now nearly limited to the importation of foreign commodities and home goods, necessary for domestic consumption: the latter consist of general merchandise from all the principal ports in the kingdom; the former of wine and spirits, timber, hemp, tallow, hides, valonia, bark, and fruit.

THE EXETER CANAL* is too importantly connected with the trade of this district to be passed over without some notice. It was made in the reign of Elizabeth, and at that time extended only to Countess

* Mr. De la Garde, in an interesting paper "on the antiquity and invention of the Lock Canal of Exeter," published in the 18th volume of the Archæologia, proves (contrary to the general belief that the formation of artificial lock canals in this country does not date earlier than 1755) that a navigable canal, with a complete apparatus of pound locks, was formed at Exeter, so far back as the year 1566. He thinks it highly probable that it was the first pound-lock canal ever constructed.

Weir; in the time of William the Third it was prolonged to the sluice-gates, which are a little above Topsham, on the opposite side; the further extension to the present mouth at Turf was commenced in 1825, and completed in 1829. In the cutting of this extended portion, the number of men generally employed was about five hundred; it is not unworthy of observation, that frequent and severe cases of ague occurred amongst them, a disease otherwise comparatively unknown in the district. The canal has now a surface breadth of one hundred feet, and a bottom breadth of thirty-four; its depth averages fifteen feet, so that vessels drawing fourteen feet of water easily pass up it. "In depth it is surpassed only by the Caledonian and Gloucester canals, whilst its sectional area is exceeded only by the former." The advantages gained by the recent alterations are a generally improved system of lockage,* increased depth, and a communication with the river at a part where the channel is more than fourteen feet deep. The effect of these improvements on the trade of Exeter has been very beneficial; it is estimated now

* "These locks are masterpieces of scientific construction. The turf lock is built on piles, driven through a fluid bog into the subjacent rock, twenty feet beneath the inverted arch. It is 131 feet in length, and 30 feet 3 inches in breadth. Its lower sill is two inches under Exmouth bar, with 16 feet water on the upper sill. Vessels of great burden pass through this lock in three minutes. The whole canal, which was carried on in the face of great natural difficulties, is finely executed. The engineer was James Green, Esq., of Exeter. A plan has been engraved, under the auspices of the Corporation, of the canal, with his extensions and improvements." (Archæologia, vol. 18.)

to be double what it was in 1825. The average number of vessels lying at the quays is about twenty; these quays are situated adjoining the city on the eastern bank of the river, where it has a width of one hundred and twenty feet, and an average depth of nine; and round the sides of a basin, which is connected with the upper part of the canal, and is nine hundred feet in length, one hundred and twenty in breadth, and fifteen in depth.

WATER-WORKS. It was mentioned in a former page * that Exeter was plentifully supplied with water from a large reservoir. This reservoir,† which occupies a spot to the north of the city, known by the name of Dane's Castle Field, is now two hundred feet square and seventeen deep, and is supplied with the water of the river Exe, taken from a mill leat, two miles from the city, and above the junction of the Creedy; it is therefore, in great measure, free from any adventitious impurities. The quality and chemical composition of this water have already been given. The original engine is worked by a breast-wheel of twenty-three horse power, with forty-eight buckets, thirteen of which are equal to one stroke of the pump; it has three pumps, each of which gives eighteen strokes in a minute. The water thus delivered in this space of time, at the reservoir, is thirty-seven cubic feet, or

* Vide antea, p. 136.

† The reservoir, and the pumps, &c., connected with it, were planned by, and completed under the direction of, William Anderson, Esq., C. I.

four hundred and thirty-eight gallons. The reservoir is one hundred and sixty feet above high-water mark, but the water could be raised by the stand-pipe, which was one hundred and fifty feet above the level of the river at Pynes Weir, to the further height of one hundred and eighty feet. On ordinary occasions, however, the number of strokes in a minute, at which these pumps are worked, is fourteen each to force the water into the reservoir, and ten to the higher levels of the stand-pipe.

It was early found, notwithstanding the great extent of this supply, that it was inadequate to the wants of the inhabitants; therefore, in 1841, a new wheel and pumps were added, the reservoir was enlarged to its present capacity, and the stand-pipe considerably elevated. The new wheel is of seventeen horse power, and has forty buckets, of which eleven are equal to one stroke of the pumps: the new pumps are three in number, and each gives fourteen strokes in a minute at its usual work: the height of the stand-pipe is now thirteen feet and a half above the level of the water in the reservoir, and its valve is weighted to raise the water fifty feet. The higher pressures are supplied independently of the reservoir.

The advantage derived from these additions and improvements will be fully appreciated, when it is stated that, on a trial being made by working the new and old pumps together, the water flowing

through the safety-valve of the stand-pipe, and falling into the reservoir, each set of pumps making eleven strokes per minute, the quantity of water delivered into the reservoir by gauge was twenty-three thousand seven hundred and forty-eight gallons in one hour: on another trial, the water being delivered to the lower level of the reservoir, the new pumps making seventeen strokes per minute, and the old eleven and a half, the quantity of water forced in was thirty-three thousand one hundred and twenty-two gallons in one hour; so that the higher level of the stand-pipe decreases the power of the pump by about one third. By experiments made in different places, it was shown that water could be delivered from the pipes thirty feet above the highest levels of the city.

One cause of failure in the old pumps, and which had not been foreseen, was excessive floods "tailing" the wheel, to such an extent as to cause material obstruction. By an experiment on the new and old wheels, during some high floods, it was found, that while the old wheel was two feet in tail water, and the pumps making but ten strokes per minute, the new wheel had only six inches in tail water, and the pumps were making twenty-one strokes per minute; so that the new wheel will be only affected by severe floods, and then but for a few hours.

The quantity of water now supplied to the inhabitants of Exeter and its vicinity is six thousand

nine hundred and nineteen hogsheads, daily; the cost of which to the consumers, according to the amount of rents paid, is little more than one farthing per hogshead, and at this trifling price it is supplied to many houses at a considerable elevation. The waste consequent upon this vast consumption is of the greatest service in preserving the health of the city, by cleansing and washing out the sewers, &c.

HOUSES. The houses of this district are built of the conglomerate and trap rocks already described,* brick, and what is provincially termed "cob." In their construction and relations, the first three present nothing remarkable; the last, however, is peculiar to the west of England, and may therefore be described.†

The walls are composed of earth and straw, mixed up with water, like mortar, and then well beaten and trodden together. This mixture is always laid upon a foundation of stonework, as it is necessary to keep it dry; hence the Devonshire adage, that "all cob wants is a good hat and a good pair of shoes." The cob mixture is laid on in layers generally, from two to four feet in depth; it is essential that each separate layer should be allowed some weeks to settle,

* Vide pp. 178 and 194.

† Vide an amusing article, contributed to the Quarterly Review, No. 116, by Richard Ford, Esq., in which the introduction of this mode of building into Devonshire is attributed to the Phœnicians, who in early days traded extensively with the western peninsula of England.

and it is then pared perpendicularly even, before another is added. When the successive layers form walls of sufficient height they are surmounted by thatch. Some months after the walls are quite finished, and supposed to be dry, they are plastered, white-washed, or rough cast, which provincially is called *slap-dash*. This mode of building is much cheaper than stone or brick, and if kept dry is very durable. Cob houses are warm in winter, cool in summer, and in every respect as comfortable as other buildings: they form picturesque objects in the landscapes of Devon, grown over as they generally are by myrtle and other flowers.

FUEL. On this head little need be said. That which the district affords, viz., wood, is too expensive for general use; coal,* which is imported from the north of England, and from Wales, may be said to be almost the only fuel used. In the houses of the poorer classes, turf is occasionally burnt, as is also tan, but the unpleasant smell of these precludes their use elsewhere.

DIET. With the exception of a few articles, there is nothing very peculiar to be noted under

* The occasional occurrence of a carbonaceous shale, and the accidental lignite formation of Bovey Heathfield have induced some individuals to think that coal might be found in this district: they have, however, only expended large sums of money in a vain attempt.

this head. Amongst the opulent, the various good things for which Devonshire is famed are indiscriminately used. The diet of the poorer classes consists for the most part of milk, potatoes, and *fine* bread; coarse bread is but seldom eaten. The Sunday is generally gladdened by baked meat, otherwise they consume but little animal food. Hake is a favorite fish amongst them; it is soft, woolly, and insipid, and little can be said in its praise, except that it is wholesome and cheap. It is usually cut into junks, and baked, with the addition of some fat, in large oval flat dishes.

CIDER is the common beverage throughout Devonshire; it is drunk in a very different condition from that in which it is met with elsewhere. The cider which is sold in London, and in other places, as imported from Devonshire, is sweet, with some flavour of the apple, and very poor in body; while that which is preferred for home consumption is of a light colour, and somewhat rough in taste. The old-cider drinker has no objection to its being a little hard, (*anglicé* sour,) and will call that a good cider which is full in body, rough in taste, and has no flavour of the apple remaining in it.

The process of making cider is very simple. In the autumn the apples are collected into heaps, in the open air, and allowed to *sweat* or pass into a state of fermentation. Such of these as become black-rotten, are, or should be, thrown aside; the

remainder are broken up, and put into the cider press, and the resulting fluid is known and sold, under the name of "cider from the pound's mouth." This is immediately put into a large vat, and then allowed to remain till a head has risen; which takes place in one, two, or three days, according to the state of the atmosphere: it is then drawn off into casks, and permitted to ferment. As often as a head rises on it, or there is a generation of fixed air, so often is it racked into a fresh cask. It usually requires racking three or four times, but in very warm weather seven or eight. When the juice no longer ferments, the process of vinification is complete, and the cider is made. It is now fit for immediate use, though it is generally esteemed better if kept for a month or two. During the hay and corn harvests each labourer is allowed on an average a gallon of this cider a day.

In the above the plain old mode of manufacture is described; but to produce ciders of a peculiarly sweet taste for exportation, *matching*, or some other means of checking fermentation, is resorted to. It is remarkable that an *unmatched* cider will not bear water-carriage for the shortest distance, nor will it sustain, in the cask, continued motion for any length of time.* Matching cider is thus accomplished.

* This is the general and prevailing idea amongst all practical cider manufacturers in the county; but I have lately been assured that *unmatched* cider has been sent without injury by water-carriage to London.

After it has been removed from the vat into the cask, as previously described, it is suffered to remain there until a head has formed, or it shows a disposition to ferment; a small quantity of the juice (say a gallon) is then drawn off into an empty cask, and while a sulphur match is being burnt within the bunghole, the juice is agitated round the sides of the cask, the remainder is then added: this process is repeated in a fresh cask, as often as it shows a tendency to ferment. In cold or still weather two matchings are sufficient, but when the weather is hot and windy, it may require to be done four or five times. This process, by checking fermentation, and thus preventing complete vinification, produces the sweet fluid in which the flavour of the fruit is retained. This cider does not contain so much alcohol as that made by the process previously described; at first it is very sweet and raw, and tastes of the apple, predisposing those who drink it to griping pains and diarrhœa, but at the end of three or four months becomes a palatable and wholesome liquor. To those who are not cider drinkers, in the Devonshire acceptation of the term, it is much more palatable than that in which the processes of fermentation have not been checked.

Dregs are deposited during the fermentation: these were formerly collected and distilled into a coarse ardent spirit, vulgarly called "still spirits." This is now scarcely ever made, in consequence of the present improved method of straining and fining

the dregs, by which all that was available for this purpose is converted into cider.

Cider is frequently observed to lose its colour and turn black, especially after exposure to the air; those who are unacquainted with this property, often ascribe it to some adulteration practised by the manufacturer. It is, however, owing to the natural tendency which apple juice has to become black, when exposed to the air. The richest cider most quickly undergoes this change.

It was mentioned in a previous page,* that the former frequency of colic in this county was traced to the existence of lead in cider, derived from the leaden basins used in the cider presses. This mischievous part of the "pound" is now almost entirely exploded, and in its place wooden basins are substituted.

DEVONSHIRE CLOUTED OR CLOTTED CREAM † is made in the following manner: the milk is allowed to remain from twelve to twenty-four hours in tin or other pans, capable of holding two or more gallons; these

* Vide p. 99.

† This process of preparing cream appears (as well as the cob building) to have been an importation from the east: Edhem Bey, the Egyptian minister of public instruction, informed me that it was made beneath the Pyramids, exactly after the manner pursued in this county; and in Fellows's Tour in Asia Minor, p. 96, we find the following passage:—"Among the hospitable presents that I have frequently received on my journey, was a simple preparation of cream used in this country, and made from the milk of the goat or buffalo, which I have not very much liked; but here it is made of cow's milk,

pans are then placed on a very slow fire, for an hour and a half, or rather until a yellow rim is formed, and some bubbles begin to make their appearance; it must not be suffered to boil, or the whole will be spoiled; on being removed from the fire it is set aside from twelve to twenty-four hours to cool; at the expiration of this time the "head," or cream, has risen to the surface, and may then be taken off as fit for use. This cream is particularly white, thick, soft, deliciously cool, and less greasy than the raw cream, indeed, I am inclined to esteem it far more wholesome, standing much in the same relation to it as the scalded does to raw milk.

A dish in some estimation in this county is junket: the following, I am assured, is a good receipt: To two quarts of milk warm from the cow, add brandy and sugar to taste, and then turn it with rennet, lay clouted cream on the surface, over which grate nutmeg and sugar; it is now fit for use; if made as above directed, it will keep solid till the next day, but if the milk have been artificially warmed, the

and is so excellent, that I give the receipt. It is called kymar, which means scum. Take a pan of new milk, let it stand on a stove, or near a fire, to simmer, but not boil; a thick scum will form over it, which must not be broken; when this is well formed, set the whole by till the next day to stand for cream, and it will be found that the cream has saturated and adhered to the spongy under part of the scum: this coating, nearly half an inch thick, may be taken off, and doubled. or rolled up; it will keep for some days, and is excellent with fruit or coffee, and good with anything. The people here seem to use it as a substitute for butter.

junket must be used within a few hours, as it is liable to "run."

Butter is not made from the raw cream, as is the custom in other counties, the usual method of making it throughout Devonshire, is by churning the clouted cream; so made, it is preferable, as keeping longer, and being free from any adventitious flavour of pasturage, which is not unfrequently retained in the more general mode. One pound and a half of this cream is estimated to yield one pound of butter, leaving a residue of half a pint of very rich buttermilk. The general arrangement of the dairy consists in preserving cleanliness, by daily washing and scalding the utensils, and in hot weather lowering the temperature by the sprinkling of cold water.

AMUSEMENTS. On this point little need be said, the only amusement generally indulged in, which is peculiar to this county, is wrestling; it differs much from the sport so called, and practised in Cornwall, and the north of England, inasmuch as the barbarism of "kicking shins" is permitted, a custom which is very prolific of obstinate ulcered legs in after years.

Chapter IV.

VITAL STATISTICS OF EXETER AND THE IMMEDIATE NEIGHBOURHOOD.

Having in the previous pages taken a view of some of the physical circumstances peculiar to the South of Devon, which may be supposed to exert an influence upon the public health, and consequently assist in determining the duration of life, I shall devote this concluding chapter to the subject of vital statistics.

To enter upon the question, for the whole extent of the district, would obviously be out of place in a small work like the present; I shall therefore confine my observations to Exeter and the immediate neighbourhood. In order to do this satisfactorily, two sets of tables have been constructed, the one consisting of the vital statistics of the town itself, the other of the parishes which comprise its environs. In these latter the population is for the most part rural,

and therefore not subject to the same influences as that of the city.

The country population comprises the inhabitants of the parishes of Alphington, Ide, St. Leonard, and Heavitree; while the town population includes that of the various parishes of the city,* together with that of St. Thomas. It must therefore be understood, when the town parishes are mentioned, the latter are referred to, and when the country parishes, the former.

Before entering upon the question of mortality, I shall briefly describe the present state of the population, and the ratio of its progression for the last forty years.

Town Population. In 1800, the town population amounted to 19,587;† 8281 of which were

* These parishes are St. Paul, St. Olave, Allhallows (Goldsmith street), St. Edmund, St. Kerian, St. Mary Arches, St. Mary Major, St. Martin, St. Petrock, The Holy Trinity, Allhallows (on the walls), St. Sidwell, St. George, St. Pancras, Precinct of the Close, St. David, St. John, St. Mary Steps, St. Lawrence, St. Stephen.

† *State of the Population from* 1800 to 1841.

Year of Census	Town Parishes.			Country Parishes.			Total.		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
1800	8281	11306	19587	1091	1227	2318	9372	12533	21905
1811	9100	12334	21434	1269	1374	2643	10369	13708	24077
1821	11926	14798	26724	1455	1798	3253	13381	16596	29977
1831	14571	17760	32331	1967	2425	4392	16538	20185	36723
1841	15842	19792	35634	2774	3484	6258	18616	23276	41892

males, and 11,306 females. In the first ten years the increase upon the gross population* was 1847, or 9·4 per cent. (4·1 per cent. males and 5·2 per cent. females.) In the next ten years the increase amounted to the very considerable number of 5290, or 24·6 per cent. (13·1 per cent. males and 11·4 per cent. females.) In the succeeding ten years, *i. e.*, from 1821 to 1831, the still greater increase of 5721 took place, although, in reference to the population at the previous census, this increase amounts to but 21·4 per cent. (10 per cent. males and 11·3 per cent. females.) In the succeeding ten years, *i. e.* from 1831 to 1841, the increase amounts to 3303, which is only 10·2 per cent. (3·9 per cent. males and 6·2 per cent. females.) The gross increase in population from 1800 to 1841 amounts to 16,047, or 81·9 per cent. (38·6 per cent. males and 43·3 per cent. females.)

I have already stated that the male population in

* *Increase of Population upon itself per cent.*

	From 1800 to 1811			From 1811 to 1821			From 1821 to 1831			From 1831 to 1841			From 1800 to 1841		
	Ma.	Fe.	Tot.	Ma.	Fe.	Tot.	Ma.	Fe.	Tot.	Ma.	Fe.	Tot.	Ma.	Fe.	Tot.
Town	9·8	9·0	9·4	31·0	19·9	24·6	22·1	20·0	21·4	8·7	11·4	10·2	91·3	75·0	81·9
Country ..	16·3	11·9	14·0	14·6	30·8	23·0	35·1	34·3	35·0	41·1	43·6	42·4	154·2	183·9	170·0
Town and Country..	10·6	9·3	9·9	29·0	21·0	24·5	23·5	21·6	22·5	12·5	15·3	14·0	98·6	85·7	91·2

1800, amounted to 8291, which is 42·2 per cent.* upon the whole population; from this time to 1811, the increase of this sex amounted to 819, or 9·8 per cent. In the succeeding ten years the increase amounted to 2826, or 31 per cent.; from which period to 1831, the increase was 3678, or 22·1 per cent.; and from 1831 to 1841 the increase was 1271, or 8·7 per cent. The total increase upon the forty years amounts to 7561, or 91·3 per cent.

The female population in 1800, amounted to 11,306, which is 57·8 per cent. on the whole population. From this time to 1811, the increase was 1028, or 9 per cent. From 1811 to 1821, the increase amounted to 2464, or 19·9 per cent. From 1821 to 1831, the increase was 3043, or 20 per cent., and from 1831 to 1841 the increase was 2032, or 11·4 per cent. The total increase of female population in the forty years, *i. e.* from 1800 to 1841, amounts to 8486, or 75 per cent.

Country Population. In 1800, the country population amounted to 2318, of whom 1091 were

* *Proportion per cent. of Males to Females.*

	1800		1831		1841	
	Males	Females	Males	Females	Males	Females
Town	42·2	57·8	45·0	55·0	44·5	55·5
Country	47·1	52·9	44·8	55·2	44·3	55·7

males and 1227 females. In the first ten years the increase upon the gross population was 325, or 14 per cent. (7·6 per cent. males and 6·4 per cent. females.) In the next ten years the increase amounted to 610, or 23 per cent. (7 per cent. males and 16 per cent. females.) In the succeeding ten years, *i. e.*, from 1821 to 1831, the increase amounted to 1139, or 35 per cent. (15·7 per cent. males and 22 per cent. females.) And from 1831 to 1841 the increase amounted to 1866, or 42·4 per cent. (18·3 per cent. males and 24·1 per cent. females.) The gross increase in forty years, *i. e.* from 1800 to 1841, amounts to 3940, or 170 per cent. (72·6 per cent. males and 97·4 per cent. females.)

The male population in 1800, in the rural districts, has just been stated to amount to 1091, which is 47·1 per cent. upon the whole population. From this time to 1811, the increase in this sex amounted to 178, or 16·3 per cent. In the succeeding ten years the increase amounted to 186, or 14·6 per cent.; from which to 1831, the increase was 512, or 35·1 per cent., and from 1831 to 1841, the increase was 807, or 41 per cent. The total increase upon the forty years amounts to 1683, or 154·2 per cent.

The female population in 1800 was stated to be 1227, or 52·9 per cent. upon the whole. From this time to 1811, the increase amounted to 147, or 11·9 per cent. From 1811 to 1821, the increase of female population on itself was 424, or 30·8 per cent.

From 1821 to 1831, the increase was 727, or 34·3 per cent.; and from 1831 to 1841 the increase was 1059, or 43·6 per cent. The total increase upon the forty years, *i. e.*, from 1800 to 1841, amounts to 22·57, or 183·9 per cent.

On comparing the state of the population in the town and rural districts from the statements above made, we find that, in 1800, there were nearly 4 per cent. more females in Exeter than in the country parishes, and, consequently, that in these latter the advantage was to the same extent on the side of the male population.* By comparing the increase in both sexes in the different periods of ten years, we find that in the first decade, *i. e.* from 1800 to 1811, the country district increased 4 per cent. on the whole population over that of the town. In the following decade the town increased 1½ per cent. over the rural; while, between 1821 and 1831, the country increased over the town 4½ per cent., and from 1831 to 1841 to the enormous extent of 32·4 per cent.† During the whole forty years the rural districts have increased more than the town 23·3 per cent.

* This very large proportion of females is so unusual that it excites a suspicion of the accuracy of the parliamentary return at this period; the subsequent history bears out such a suspicion.

† This is somewhat to be accounted for in the vast immigration that has taken place into the parishes of Heavitree and St. Leonard during the last few years.

One very curious fact presents itself connected with the relative advance of male and female population as shown in these tables, which is that in the period between 1811 and 1821, while there was a disproportioned increase in the rural district of the female population over that of the male, (rather more than double,) there was in the city an increase of male population over female to the extent of 12 per cent. Were it not for this latter fact, we might be inclined to account for the deficiencies of the male sex in the country, by supposing that the wars of that period had drained and kept it under; but when we take it in connexion with the increase of males in the city, we must account for the discrepancy by supposing that there was a migration of the male population, during this decade, from the country into the city. Taking the whole period of forty years, this discrepancy still obtains; for the increase of males over females in the town amounts to 16·3, while in the rural district the females have increased 29·7 over the males. This prevailing through so long a period suggests the existence of a general law of increase in the male population applicable to the town, and not to the country, either by male immigration, or an opposing relation of births and deaths in the two sexes, &c.; be this as it may, the fact is a singular one, and well worthy of observation. We shall conclude this history of the progressive state of the population during the

last forty years, by stating that the mean increase, as deduced from its progression during the four decades, is rather more than 2 per cent. annually in the town, and upwards of 4 per cent. in the country, and that the mean annual increase in the rural district is 2 per cent. over the town. This is easily accounted for, when it is recollected that the town is confined to certain limits, which are very fully occupied, while the country has latterly received vast supplies of population from immigration.

I shall now proceed to consider the births, marriages, and deaths.

Marriages. In ten years, with a population of 28,242, the number of marriages that took place amounted to 3179, which gives a yearly average of 1 in 88 (1·09 per cent.); so that out of 88 persons, two are annually contracted together in marriage. This is very greatly above the average of England, which amounts to but 1 marriage in 129 persons; and of the county of Devon, which is only 1 in 134. The nearest approach in all England to the average of Exeter is in the county of Middlesex, which is 1 in 102. It is remarkable that a greater proportion of marriages take place in Exeter than has been supposed to occur. Mr. Sharon Turner gives as the extreme limits 1 in 90 and 1 in 175.

Births. According to the parliamentary returns of 1831, the average number of births attending each marriage, amounts during ten years in the city of Exeter to but 2·3 (4 is the average of all England), and they bear a proportion to the whole population of Exeter of 2·6 per cent.

According to the returns which I have made, and upon the accuracy of which I can fully depend, the births in ten years, *i. e.*, from 1825 to 1834* inclusive, in the town parishes, amounted to 8804, (consisting of 4640 males and 4164 females,) which gives an average of 1 in 37 (2·7 per cent.†), an average which corresponds with that of the whole kingdom. In the country parishes, the births amounted in the same period to 1346, (692 males and 654 females,) or 1 in 32 annually upon the whole population (3 per cent.) This advantage on the part of the rural district is in accordance with the greater relative increase in population, which it has been elsewhere pointed out to enjoy over the town, (in the proportion of 35 to 21·4.) The proportion of male births over female, though inconsiderable, must not be omitted, as it bears upon the

* Throughout the following observations this period has been selected as being that from which the climate has been illustrated, in order that its effects may be better appreciated. The returns both of the births and deaths which constitute my data, have been made by myself, with the extremest accuracy.

† Vide postea, p. 240.

question of mortality to be presently noticed. In the town parishes, out of 100, 52 are males and 48 females: in the country parishes, 51 are males and 49 are females.

As the natural possibility of bearing children only endures in this country from the ages of fifteen to forty-five, the increase of the population can never be greater than such as that proportion of its females allows, who are between these ages. The number of women within the limits of the maternal state in Exeter amounts to 8526, or about half of the whole female population, (this very nearly agrees with observed proportions in Saxony and North America;) it therefore follows, as the annual average number of births amount to 880, and which number represents those who are carrying children, that 1 in 96 of those capable, are in the situation to increase the population at every period.

The statistics of the Lying-in Charity of this city are very interesting. I have selected for illustration the same period that generally has engaged our attention for the purposes of this investigation, *i. e.*, from 1825 to 1834 inclusive. The mean annual number of females who applied for this charity was 144, the ages of whom average thirty-two years and a half; the number of children they had already borne amounted to 5·05, of which 3·26 were reported as living. If to the children born the child, that is to be produced by the same mother, be added,

the average is 6·05, a much larger proportion than can be contemplated as the real average of the city; but this may be easily accounted for by these women obtaining the charity from the circumstance of their being persons with large families, and by its not including those who never become mothers. It is the custom of this charity that the women report the result of their confinements: these reports in the ten years amounted to 836; the births attending which were 420 males and 416 females;* of these, 34 were still-births, (1 in 24,) an enormous proportion, arguing that those so poor as to require the benefit of the charity, are much more liable to this casualty than women in a better station of life; and 9 were twin-births, (1 in 93:)† of these, 2 were girls, 3 were boys, 2 were boy and girl, and 2 were not reported.

DEATHS. I shall now proceed to a consideration of the mortality of Exeter and the neighbouring rural parishes, for this purpose I have arranged several separate tables; the more striking results of which will be briefly explained and contrasted, for the sake of better illustration, with the results published in the most accredited tables.

* This very nearly agrees with the returns of the Dublin Lying-in charity.

† This must be taken as a high average, as women having unusual births, are more regular in reporting themselves; but if we take the number of twin-births (9), and compare them with the whole number of women admitted (1440), the proportion is 1 in every 160. This is, of course, the extremest limit.

We will first state the condition of the population in 1831. The census of this year, as my tables are composed of results gleaned from a period of five years previous and five years subsequent to this time, offers a tolerably fair average for our purpose. The population of Exeter in 1831, together with that of St. Thomas, is stated to be 32,445, the males being 14,604, or 45 per cent., and the females 17,841, or 55 per cent. The deaths during the period of ten years, from 1825 to 1834, amounted to 7362 (consisting of 3813 males and 3549 females), which is 1 in 44, or 2·2 per cent.

The population of the country district in 1831 amounted to 4392, the males being 1967, or 44·8 per cent., and the females 2425, or 55·2 per cent. The deaths during the above period of ten years amounted to 923 (consisting of 449 males and 474 females), which is 1 in 47, or 2·6 per cent.

From what has been previously stated when speaking of the births of this district, it will be seen that there is a surplus in their favour—in the town of 1442, and in the country of 423,* so that the

* *Number of births and deaths from* 1825 *to* 1834.

	Town.			Country.		
	Males	Females	Both	Males	Females	Both
Births	4640	4164	8804	692	654	1346
Deaths	3813	3549	7362	449	474	923
Surplus of births over deaths	827	615	1442	243	180	423

births of the town exceed the deaths 18 per cent., and in the country 22 per cent. This excess agrees tolerably well with the proportions of the kingdom generally, the mean of which amounts to 20 per cent. Considered with respect to the whole community, Mr. Sharon Turner observes* "the latter period of the last census presents pretty nearly the proportion of four burials to six births in our highly favoured, healthy, and prosperous country." As this proportion has not been exceeded in Exeter, may it not be inferred that the great increase of population which has taken place must be mainly attributed to immigration rather than to an overflowing of its own fountains?

I shall now introduce various tables, which are the results of different arrangements of the mortuary returns, and then proceed to point out such prominent facts as they indicate in regard to the law of mortality, as applicable to the district under investigation.

TABLE I.—*Relative proportion of deaths, at all ages, in Exeter, (town and country,) in Devon, and in Carlisle, the whole population being assumed to be* 10,000.

	Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
Exeter—											
Town	4242	461	739	739	719	780	836	907	510	61	6
Country	4052	564	737	606	640	834	813	1094	563	87	10
Devon ...	3641	503	703	628	587	693	1019	1288	804	129	5
Carlisle..	3569	384	462	576	671	817	1244	1440	732	98	7

* Sacred History of the World, vol. iii, page 149.

TABLE II.—*Law of mortality of Exeter (town and country,) stated relatively with Devon and Carlisle, the total number of births being supposed to be* 10,000, *from which it appears there will be alive at the several ages of—*

	10	20	30	40	50	60	70	80	90	100
Exeter—										
Town	5758	5297	4558	3819	3100	2320	1484	577	67	6
Country.....	5948	5384	4647	4041	3401	2567	1754	660	97	10
Devon	6359	5856	5153	4525	3938	3245	2226	938	134	5
Carlisle	6431	6047	5585	5009	4338	3521	2277	837	105	7

TABLE III.—*Actual number of persons alive in* 1831, *at each age in Exeter, presuming that they are in the same proportion as in* 1821.

	Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
Males.....	4013	3002	2048	1969	1500	997	679	324	74	1	
Females...	3722	3402	3556	2372	1794	1373	965	483	153	21	
Both	7735	6404	5604	4341	3294	2370	1641	807	227	22	

TABLE IV.—*Proportional number of persons alive, at all ages, in Exeter and in all England, supposing the whole population of both sexes to be* 10,000.

	Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
Exeter ...	2387	1976	1729	1340	1012	732	506	249	63	6	
England...	2796	2104	1583	1182	936	609	452	225	61	5	

TABLE V.—*Annual proportion of deaths to the living inhabitants in the undermentioned places:*

Exeter.		Devon.	England.
Town	Country		
1 in 44	1 in 47	1 in 58	1 in 49

TABLE VI.—*Mortality per cent. in the undermentioned places :*

	Exeter.		Devon.	Northampton.
	Town	Country		
Birth to 10	42	40	38	42
10 to 20.....	8	9	9	9
20 to 30.....	14	13	12	14
30 to 40.....	16	13	12	17
40 to 50.....	18	15	13	21
50 to 60.....	25	24	18	28
60 to 70.....	36	31	31	39
70 to 80.....	61	62	58	61
80 to 90.....	89	80	86	90
90 to 100.....	91	90	96	100
100 to.....	100	100	100	

TABLE VII.—*Results of mortality arrived at from different sources.*

Out of persons	who attain the age of	there die before the age of	according to the			
			Carlisle table	experience of the Equitable Society	Northampton table	Exeter city table
6460	10	20	370	309	618	515
6090	20	30	448	443	886	849
5642	30	40	567	579	965	914
5075	40	50	678	652	1086	955
4397	50	60	754	900	1260	1106
3642	60	80	2690	2244	2805	2229

It appears from an examination of these tables that more die (very considerably so) in Exeter between birth and ten years of age, than is the case either in the county of Devon or in Carlisle, the mortality of which latter place is assumed by Milne to be a fair criterion of the mortality of England. This

also holds good in respect to the rural district. It is not a little singular that in the succeeding decade, *i. e.*, from 10 to 20, though more deaths occur in Exeter than do at Carlisle, yet they are fewer than is the case in the agricultural district of the city or in the county, which would argue that town life was more favorable to population in these years than country life. Between twenty and thirty the mortality both of Exeter and the neighbourhood is far in excess of the mortality given in the Carlisle or Devonshire returns. In the next period, that is from thirty to forty, though the mortality of the town parishes is in excess of that of the Carlisle tables, and of the returns of the county of Devon generally, yet the mortality of the rural district of the neighbourhood is below that of Carlisle. The same holds good as regards the period between forty and fifty, as also between fifty and sixty, and sixty and seventy.

We now arrive at a different point of the tables, *i. e.*, when three score years and ten of life have been completed, and when a large proportion of deaths rather speaks of those who have lived to a good old age. In this respect the rural parishes of this district are conspicuous; for out of 10,000 we find 1754, of whom 1094 died before the age of eighty was completed; while in Exeter there remain but 1494, but of whom only 907 died; while we find at Carlisle but 1440, and in Devon 1288. In the succeeding

period, *i. e.*, between eighty and ninety, we find both Carlisle and Devon ranging very high in their rate of mortality both over the rural district of Exeter and its city, the mortality of which last has the lowest range. In the following period, *i. e.*, from ninety to a hundred, Exeter and the surrounding country have less mortality than either Devon or Carlisle, and this latter is more favorable to life than Devon at this period. The concluding period, which includes all those above a hundred years of age, shows that in the rural district there are to die, 10; in Carlisle, 7; in Exeter, 6; in Devon, 5. From hence we may infer, that though both Exeter city and rural district are not propitious to youthful existence, yet that they are particularly so to those advanced in years, or those who have passed the meridian of life. Much the same law prevails, as this would indicate, in Saxony, where considerably more than half die under six, while the greater proportion of the other moiety attain a fair old age.*

The following table will show, at a glance of the eye, the number that die at the several periods of life out of every hundred born in Exeter.

TABLE VIII.—*The mean relative mortality per cent. at different ages.*

Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
42·40	4·64	7·36	7·38	7·18	7·81	8·35	9·07	5·09	·61	·06

* Sacred History of the World, page 160.

By reference to table II. in which is stated the number living, of 10,000 births at the different decades of life, it will be seen that at the age of twenty, but very few more than half the population survive; wherefore we may state, that of those born alive, half do not attain the period of life in which they are capable of regenerating their species, while rather less than one third of these 10,000 survive such period. From the excess of persons who die in the early periods of life, it necessarily follows that there are fewer left to attain the more advanced periods; it is, therefore, worthy of remark, that the number who are alive at a hundred in Exeter is greater than in Devon generally, while in the rural districts of this city there is actually a larger proportion living at this very advanced period of life than at Carlisle or in Devon. From this table we may also ascertain the number living out of every 10,000 births in every age: thus we see the number of survivors in Exeter at ten years of age amounts to 5758, and so on through every period of life. As far as a consideration of the probabilities of life is concerned, this is a very useful table, but cannot be esteemed complete, unless the actual number living at each period of life is known. Here I was threatened with difficulty, (for no such observations have been published on the population of this period,) and it was only surmounted by taking the census of 1821, and from the data, there given, deducing the relative proportionals. Having done this, two tables

were constructed, by which (tab. III) we can see the actual number of persons alive in 1831, at each age, in Exeter, as well as the proportional number (tab. IV), supposing the whole population of both sexes to be 10,000. These tables become important in any calculations upon the chances of life, and enable us to deduce its probability in any individual. Say we take one at thirty years of age, what chances has such person of attaining his fortieth year? We may see by reference to the returns there are living at this age 3356, 544 of whom die before the next decade is completed; therefore, any person in Exeter who is thirty years of age, has 2812 chances of living till he is forty, and 544 of dying before that period, or, in other words, it is more than five to one that he will be living at forty. Let us apply the same law, and see what are his chances of surviving to the age of seventy. At thirty, 3356 are living, while at seventy there are but 1093 survivors; 2263 deaths having occurred during the intermediate years; there are, therefore, 2263 chances of his dying, and but 1093 of his surviving, or the chances are two to one against his arriving at this age. The same law may be applied to any period of life.

The three other tables (V, VI, VII,) illustrate the mortality of Exeter as compared with other places. In table V is shown what number of the living supply one death annually: Exeter ranges very low, amounting to only 44, while the average of England

is stated to be 49. In table VI, where the mortality is stated in reference to its proportion per cent., the coincidence will be seen to be very remarkable between Exeter and Northampton; the advantage, however, is in favour of the former, the mortality being considerably in excess at Northampton. Table VII is interesting, as showing the relation between the mortality of Exeter and that stated in the Carlisle tables, and from the experience of the Equitable Society.

Having now stated the general law of mortality proper to the district, I shall proceed to direct a few observations to the influence exerted by climate in modifying its occurrence during the different years and months.

In the town parishes the average annual mortality amounts to 736·2 (381·3 males and 354·9 females.) During the period of ten years six are below the average, and four above.*

In the four country parishes the average annual mortality amounts to 92·3 (44·8 males, 47·5 females.)

* *The number of deaths in the Town Parishes during each year for ten years.*

	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
Males	333	297	326	446	306	344	340	524	412	485
Females	335	327	265	423	260	277	316	542	383	421
Total ..	668	624	591	869	566	621	656	1066	795	906

During the ten years * three are about the average, four considerably below, and three above. On com-

The distribution of the 7362 *deaths in the Town Parishes, according to their several ages in each year for ten years.*

Deaths.	From Birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
1825.....	262	32	53	53	46	58	53	61	43	6	1
1826.....	202	29	37	39	63	53	75	83	37	5	1
1827.....	208	25	37	49	57	55	55	60	42	3	0
1828.....	497	35	61	49	37	47	59	53	28	3	0
1829.....	226	12	59	39	38	41	56	54	35	4	2
1830.....	264	28	46	51	38	53	52	57	26	6	0
1831.....	307	43	35	40	44	28	54	61	40	3	1
1832.....	362	59	91	108	106	116	83	98	35	8	0
1833.....	349	39	60	59	46	53	71	68	48	2	0
1834.....	446	38	64	57	54	71	57	73	41	5	0
Total....	3123	340	543	544	529	575	615	668	375	45	5

* *The number of deaths in the Country Parishes during each year for ten years.*

	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834
Males.....	50	51	23	52	39	43	45	35	57	55
Females.....	42	40	25	76	56	38	42	53	48	53
Total	92	91	48	128	95	81	87	88	105	108

The distribution of the 923 *deaths in the Country Parishes according to their several ages in each year for ten years.*

Deaths.	From birth to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	90 to 100	100 to
1825	33	7	8	4	5	9	12	7	7	0	0
1826	30	7	5	6	6	10	8	11	7	1	0
1827	23	1	4	3	2	3	5	4	2	1	0
1828	70	5	6	5	8	12	2	12	6	2	0
1829	32	3	8	7	7	6	9	13	8	2	0
1830	29	3	5	7	7	7	8	11	3	1	0
1831	36	6	7	5	1	7	6	12	6	0	1
1832	24	6	9	8	8	6	12	9	6	0	0
1833	44	10	9	4	10	10	5	10	3	0	0
1834	53	4	7	7	5	7	8	12	4	1	0
Total..	374	52	68	56	59	77	75	101	52	8	1

paring the tables which are quoted in the preceding page, it will be seen that these three years are the same as those in which the mortality of the town is above the average, (provided 1832, the year of the cholera, be excluded from the latter.) We might therefore suppose that the climate proper to these years would indicate certain conditions obnoxious to life, but further examination shows that not unfrequently the period of the year at which the great amount of mortality took place, presents a very different character of climate to that which is proper to the year itself; consequently, the better way of illustrating the effect of climate upon the duration of life will be to notice the character of the periods themselves, which are marked by great mortalities, or the contrary: before doing this, however, one or two facts indicated by these tables may be briefly alluded to.

It appears, that generally the great excesses of mortality are caused by infantile epidemics; that the years (1828 and 1833) in which these particularly occurred, are not attended by a high rate of mortality during the middle periods of life; that the years (1826 and 1827) which are particularly marked by high averages in the middle periods of life, present a low average in the early periods; we may therefore fairly infer that the climatorial conditions which are favorable to the one are obnoxious to the other.

As somewhat connected with the question we may observe, that the record of mortality in the

town and country parishes during the years 1828 and 1832 indicate that the Asiatic cholera is essentially a disease of cities, and prevailed in Exeter during a season otherwise not obnoxious to health, for the mortality in the country parishes was at the same time low in average; that the Asiatic cholera chiefly found its victims amongst persons above the age of twenty, and, comparatively speaking, rarely below ten, whilst the English cholera, on the contrary, rather affected the country, in preference to the town (though both suffered severely), and was more especially fatal in the first ten years of life, in fact it appears to have been the most fatal of all the epidemics to the early periods of existence.

The mortality ranges inordinately high in the town parishes during August, its average is stated to be 102·3, while the mean monthly mortality is only 61·3:* this high rate, however, is somewhat

* *The average monthly number of deaths in the twenty-one Town Parishes.*

Males.	Females.	Total.
31·8	29·5	61·3

The average number of deaths for each month.

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Males	28·7	26·3	29·8	30·4	29·7	26·8	30·2	52·0	36·2	32·4	27·8	31·0
Females	27·7	28·1	29·4	23·9	28·2	24·1	26·1	50·3	34·7	30·0	25·6	26·8
Total....	56·4	54·4	59·2	54·3	57·9	50·9	56·3	102·3	70·9	62·4	53·4	57·8

accounted for by the accidental addition of a number of deaths in that month, during the prevalence of the cholera in 1832. If the mortality of this month be excluded, the much lower average of 67·7 is arrived at, and which is undoubtedly the more correct of the two: we then find that September is the month of all others the most obnoxious to life, and that the three months of August, September, and October, form the period throughout the year of the greatest mortality. The remaining months do not vary very essentially in their relative proportion of deaths; June shows the fewest number, and during the winter, generally, the average is low.

The distribution of the 7362 *deaths, according to their several ages in the different months, during the ten years from* 1825 *to* 1834 *inclusive.*

	From Birth to 10		10 to 20		20 to 30		30 to 40		40 to 50		50 to 60		60 to 70		70 to 80		80 to 90		90 to 100		100 to	
Deaths.	Ma.	Fe.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M	F.	M	F.
Jan. ..	117	88	9	21	22	21	19	17	26	17	23	21	22	27	28	43	18	19	2	3	1	0
Feb. ..	99	99	16	5	16	24	21	13	20	15	27	15	29	32	18	46	13	28	4	3	0	1
March	141	112	12	18	27	18	22	17	14	17	23	25	22	30	22	32	15	24	0	1	0	0
April .	138	95	14	13	27	10	25	10	26	17	16	27	15	25	18	23	21	13	4	6	0	0
May ..	148	130	11	16	26	25	21	21	20	18	21	16	17	25	25	18	8	11	0	2	0	0
June ..	128	106	11	17	28	17	19	15	15	16	24	17	19	21	13	23	11	8	0	1	0	0
July ..	123	118	12	11	30	20	26	17	30	15	24	12	22	20	25	33	9	14	1	0	0	1
Aug. ..	244	192	26	28	39	37	48	46	47	41	36	39	38	42	30	48	12	26	0	3	0	1
Sept. .	169	149	25	16	17	24	27	19	23	20	27	35	24	33	32	33	17	17	1	1	0	0
Oct. ..	151	132	12	7	14	18	27	24	22	18	35	19	27	25	25	30	9	24	1	3	1	0
Nov...	114	98	12	14	19	21	28	15	16	21	27	16	24	27	24	24	12	16	2	4	1	0
Dec. ..	135	97	9	5	19	24	20	27	37	18	31	19	24	25	19	36	16	14	0	3	0	0
Total	1707	1416	169	171	284	259	303	241	296	233	314	261	283	332	279	389	161	214	15	30	3	3

In the country parishes* there is some little deviation from the above; August, September, October, and November are the months attended by the greatest mortality, and May by the least. De-

* *The average monthly number of deaths in the four country parishes.*

Males.	Females.	TOTAL.
3·73	3·96	7·69

The average number of deaths for each month.

	Jan.	Feb	Mar	Apr	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Males	4·8	3·3	3·4	4·6	3·5	3·9	2·7	3·6	4·6	3·2	4·3	2·9
Females ..	3·2	3·1	4·2	3·5	3·1	3·7	4·5	5·3	4·6	4·7	4·1	3·1
Total ..	8·	6·4	7·6	8·1	6·6	7·5	7·2	8·9	9·2	7·9	8·4	6·

The distribution of the 923 *deaths, according to their several ages, in the different months, during the ten years from* 1825 *to* 1834 *inclusive.*

Deaths.	From Birth to 10.		10 to 20.		20 to 30.		30 to 40.		40 to 50.		50 to 60.		60 to 70.		70 to 80.		80 to 90.		90 to 100.		100 to	
	Ma.	Fm.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M	F.	M.	F.	M.	F.	M.	F.
Jan..	23	8	3	0	4	5	1	5	3	3	4	2	5	1	2	4	3	3	0	1	0	0
Feb.	13	13	0	2	1	1	2	3	1	1	2	1	4	0	5	7	4	2	1	1	0	0
Mar.	15	12	0	4	1	3	4	3	1	0	4	4	5	6	1	8	3	1	0	1	0	0
April.	12	11	4	3	2	2	3	1	4	6	8	4	5	3	6	3	2	2	0	0	0	0
May	12	12	4	1	2	5	2	3	3	2	5	1	0	0	4	3	2	2	1	2	0	0
June	17	17	3	2	3	4	2	2	1	4	4	3	6	2	2	2	1	1	0	0	0	0
July	12	14	1	6	2	2	2	1	3	4	2	5	2	2	3	5	0	6	0	0	0	0
Aug.	19	22	1	3	0	9	3	3	4	3	4	1	2	5	2	6	1	0	0	0	0	1
Sept.	29	18	2	1	3	5	2	1	0	2	1	3	3	3	4	11	2	1	0	1	0	0
Oct.	11	15	2	4	2	3	5	4	2	4	3	4	2	6	3	3	2	4	0	0	0	0
Nov.	21	18	2	1	3	1	1	0	0	4	5	4	3	6	4	6	4	1	0	0	0	0
Dec.	14	16	0	3	3	2	2	1	2	2	3	0	2	2	2	5	1	4	0	0	0	0
Total	198	176	22	30	26	42	29	27	24	35	45	32	39	36	38	63	26	26	2	6	0	1

cember, both in town and country, appears to be generally healthy; January and April, which have a low average in the former, range rather above the mean in the latter. In the country parishes we observe that August and October are peculiarly obnoxious to female life, and that January is proportionably more destructive to male existence: may not this latter circumstance find some explanation in the disease consequent on the dissipation, chiefly indulged in by the male population, at this season of the year?

The true relative *force* of mortality in the different periods of life may be appreciated from the following tables, in which the mean number of deaths for every month during the different periods of life in the town parishes is reduced to the relation which they bear to one hundred.

TABLE IX.—*The relative mortality shown in the number of deaths per cent. at different ages during the several months.*

	Birth to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	100 to
Jan. ...	36·34	5·31	7·62	6·38	7·62	7·80	8·70	12·58	6·56	·88	·17
Feb. ...	36·39	3·86	7·35	6·36	6,43	7·72	11·21	11·76	7·53	1·47	·18
March	42·73	5·06	7·60	6·58	5·23	8·10	8·78	9·12	6·58	·16	·00
April...	42·85	4·97	6·81	6·44	7·91	7·91	7·36	7·55	6 26	1·84	·00
May ...	48·01	4·66	8·80	7·25	6·56	6·39	7·25	7·42	3·28	·34	·00
June...	45·97	5·50	8·84	6·67	6·09	8·07	7·85	7·07	3·73	·19	·00
July ...	42·62	4·08	8·86	7·61	7·97	6·39	7·46	10·30	4·08	·17	·17
Aug ...	42·61	5·26	7·42	9·18	8·60	7·32	7·82	7·62	3·71	·29	·09
Sept ...	44·85	5·78	5·78	6·48	6·06	8·74	8·03	9·15	4·79	·28	·00
Oct. ...	45·52	3·04	5·12	8·15	6·41	8·63	8·33	8·81	5·28	·64	·16
Nov....	39·51	4·86	7·49	8·05	6·92	8·05	9·53	8·98	5·24	1·10	·18
Dec....	40·12	2·43	7·43	8·11	8·63	8·65	8·47	9·51	5·19	·51	·00
Mean..	42·40	4·64	7·36	7·38	7·18	7·81	8·35	9·07	5·09	·61	·06

TABLE X. — *The mean relative mortality per cent. in the several months.*

Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
7·66	7·38	8·41	7·36	7·72	6·77	7·64	13·76	9·62	8·47	7·25	7·71

Though these tables sufficiently explain themselves, a few of the more striking facts presented by them may be briefly noticed. January and February appear to be especially favorable to infant life, while there is a slight excess of mortality in January from the ages of 10 to 20, and a greatly increased proportion from 70 to 80, as also during the subsequent periods of life; February differs from January in being favorable to life during the ages from 10 to 20, and its excess of mortality commences at the earlier period of 60. March and April present nothing remarkable; the mortality during each period of life appears to range in about an even proportion with the calculated means, with the exception of the middle periods being more favorable. May is the month most destructive to infancy; and June, which of all months in the year is, in the aggregate, the least fatal, bears likewise a high proportion in this latter respect, but they are both particularly favorable to advanced years. July is chiefly characterized by being obnoxious to life between the ages of 70 and 80, and August between 30 and 50. September and October, with the exception of a high average of infant deaths, present nothing very remarkable.

November and December are peculiarly characterized by being favorable (the former the most so of any of the months) to the earlier periods of life, and obnoxious to the later. The broad fact presented by the above is that the cold months of November, December, January, and February are marked by the least mortality in childhood and the greatest in advanced years; and that the summer months of April and May (and September and October in a less degree) are characterized by a large proportion of mortality in early life, and a small proportion in the more advanced periods. This would appear to confirm the statement, previously deduced from the mortality in the several years, that the climate which is obnoxious to early life is congenial to advanced years, and *vice versa*. By a comparison of the mortality with the climate of the different seasons in the several years, it appears that in the winters and springs which are warm and moist the mortality is low, and in those that are cold or very rainy it is high; that in the summer and autumn the mortality is low when the climate is genial and cool, and high when it is hot and dry; so that we may conclude a genial moist air is favorable to life in this climate.

With regard to the sexes generally, it may be observed that more males than females die before ten years of age; more females than males from 10 to 20, and then more males until after 60, when female mortality is again in excess. This, with very slight

variation, is the case both in the town and country parishes.

I shall conclude this sketch by appending the following interesting statement of the mortality in the several parishes of the city and country. The differences are very remarkable. Those parishes of the former whose range of mortality is low, occupy the central and well inhabited portion of the city: this low rate is most probably caused by the retiring of tradespeople, and the removal of servants in sickness and old age to the other parts of the town, which, while lessening the amount of mortality in these parishes, disproportionately increases that of others. Among the country parishes Heavitree and St. Leonard show a much lower rate of mortality than Ide or Alphington; this may be explained by the immense immigration that has taken place into the two former, and not into the two latter parishes.

TABLE XI.—*Population, actual mortality, mortality per cent. in the country parishes of Exeter.*

	Population in 1831.			Actual mortality in ten years.			Mortality per cent.		
	Males.	Fem.	Total.	Male.	Fem.	Total	Males.	Fem.	Total.
S. Leonard ...	196	271	467	38	38	76	1·938	1·402	1·627
Heavitree	823	1109	1932	176	170	346	2·138	1·532	1·790
Alphington ..	583	653	1236	144	162	306	2·470	2·480	2·475
Ide	365	392	757	91	104	195	2·493	2·653	2·573
Total	1967	2425	4392	449	474	923	2·282	1·954	2·101

TABLE XII.—*Population, actual mortality, and mortality per cent. in the several parishes of the city of Exeter and St. Thomas.*

	Population in 1831.			Actual mortality in ten years.			Mortality per cent.		
	Males.	Fem.	Total.	Male.	Fem.	Total	Males.	Fem.	Total
St. Martin	113	185	298	7	11	18	·619	·594	·604
St. Petrock	106	161	267	12	10	22	1·132	·621	·861
St. Stephen.....	193	289	482	22	22	44	1·140	·761	·912
St. Kerian	221	249	470	44	31	75	1·190	1·245	1·595
Allhallows, Goldsmith St..... ..	187	233	420	33	40	73	1·764	1·716	1·738
St. John	257	329	586	44	65	109	1·712	1·975	1·826
St. Lawrence	291	329	620	67	48	115	2·302	1·458	1·854
St. Olave	446	518	964	96	98	194	2·152	1·891	2·012
The Close	268	407	675	65	74	139	2·425	1·818	2·059
St. David	1450	1628	3078	334	303	637	2·303	1·861	2·069
St. Thomas	1921	2282	4203	468	405	873	2·436	1·774	2·077
St. Pancras	173	206	379	38	37	75	2·196	1·796	1·978
Trinity.....	1251	1596	2847	347	252	599	2·772	1·578	2·103
St. Paul's	749	889	1638	172	175	347	2·296	1·968	2.118
Allhallows, Walls	401	488	889	99	95	194	2·468	1·946	2·182
St. Mary Arches ..	345	363	708	77	88	165	2·231	2·424	2·330
St. Edmund	713	810	1523	194	165	359	2·720	2·037	2·357
St. Sidwell	2758	3844	6602	907	857	1764	3·288	2·229	2·524
St. Mary Major ...	1665	1851	3516	452	464	916	2·714	2·506	2·605
St. George	447	461	908	133	119	252	2·975	2·581	2·775
St. Mary Steps	616	642	1258	202	189	391	3·279	2·943	3·108
Total.....	14571	17760	32331	3813	3548	7361	2·616	1·997	2·276

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