

W. L. Michels

GENERAL VIEW R. P. D. 1801

OF THE

AGRICULTURE AND MINERALOGY, PRESENT
STATE AND CIRCUMSTANCES

OF THE

COUNTY WICKLOW,

WITH

OBSERVATIONS

ON

THE MEANS OF THEIR IMPROVEMENT,

DRAWN UP FOR THE CONSIDERATION OF

The Dublin Society,

INSTITUTED UNDER THE AUTHORITY OF PARLIAMENT FOR THE
IMPROVEMENT OF HUSBANDRY AND INTERNAL RESOURCES,

BY

ROBERT FRASER, ESQ.

AUTHOR OF THE AGRICULTURE REPORTS OF THE COUNTIES
OF DEVON AND CORNWALL.

*Omnium rerum, ex quibus aliquid acquiritur, nihil est agricultura melius
nihil uberius, nihil dulcius, nihil homine libero dignius.*

CIC. DE OFFIC. I c. 42.

Dublin :

PRINTED BY GRAISBERRY & CAMPBELL, TO, BACK-LANE.

—•••—
1801.



No.....	73988
CLASS.....	I 620.94184
GAT.....	✓
INIT.....	R.G.

TO THE READER.

This REPORT is at present, printed and circulated for the purpose merely of procuring further information, respecting the state and husbandry of this district, and of enabling every one interested in the welfare of this country, to examine it fully, and contribute his mite to its improvement.

The Society do not deem themselves pledged to any opinion given by the Author of this Survey; and they desire, that nothing contained in it be considered as their sentiments; they have only published it, as the report of the gentleman, whose name is affixed, and they publish it, for the comments and observations of all persons, which they entreat to be given freely and without reserve.

It is therefore requested, that the observations on reading this work may be returned to the Dublin Society, as soon as may be convenient, and which will meet with the fullest attention in a future edition.



INTRODUCTION.

MULTUM SCRIBENDUM NON MULTA,

IS an adage which may be considered not inapplicable to the species of composition which is with much diffidence attempted in the following pages. Nor is it easy to conceive an undertaking more difficult than to give such an account of a province as shall on the one hand be minute enough to convey satisfactory information; and on the other, to avoid details of insufficient importance, and to point the spirit of the narration to dignified and appropriate objects of local attention.

I am far from being able to flatter myself that I have succeeded either in the one, or the other of these attainments, so as to afford general satisfaction. I have only to say, that

INTRODUCTION.

according to the best of my abilities it has been my endeavour to present such circumstances in this outline, which appeared to my understanding peculiarly interesting to the public, or which might carry results leading to the future improvement of the district.

The account also which I have given of the singular phenomenon of gold being found in this county, of the extensive metalliferous strata with which it abounds, the numerous streams of water also, and opportunities for the erection of machinery, may attract the attention of men of extensive capital in other parts of the United Kingdom, fair and ample scope being here afforded for the employment of vast sums, in the *skilful* pursuit of the treasures contained under the surface of the earth; as well as in the improvement of the soil, and the establishment of manufactures. At the same time that the attentive observation of all these extensive resources, impresses the fullest conviction, that the County of Wicklow must in the natural progress of things attract enterprize and capital, to the production of additional wealth
and

INTRODUCTION.

and strength to the empire; the wonderful beauty and variety of the county, its immediate vicinity to the metropolis, the extension of its maritime coast, render it of all parts of the island one of the most desirable for rural residence, while by the improvement of its harbours, (which it is to be hoped will be proceeded in with spirit) an easy communication is formed with the British shores.

The bare possibility of the again bursting forth of that animosity and hatred, which render the people of the same country greater enemies to each other, than those of different countries ever are, must, it is to be feared for a time, impede the diffusion of capital and enterprize in this part of the united kingdom, and deter people at a distance from embarking in speculations, otherwise so likely to attract general attention.

From every thing however, that could be recently observed, tranquillity seems completely restored in the county of Wicklow, and the most perfect protection afforded to property and personal security. Nor can
there

INTRODUCTION.

there be a doubt, that by the magistrates and gentlemen of the country continuing their exertions in aid of the administration of IMPARTIAL JUSTICE, and in promoting the exercise of charity and benevolence, a happy alteration for the better will speedily take place amongst the inhabitants of all ranks and persuasions, and a general emulation arise in the improvement of agriculture, and the advancement of the happiness and prosperity of an island, on which the beneficent author of nature has liberally conferred benefits almost unbounded.

CONTENTS

CONTENTS

OF THE
CHAPTERS.

PART I.

Geographical and Mineralogical.

	Page.
SECT. 1. <i>Situation and extent,</i>	1
2. <i>Divisions,</i>	2
3. <i>Climate,</i>	3
4. <i>Mountains and general strata,</i>	5
<i>Granite strata,</i>	6
<i>Hornstone strata,</i>	8
<i>Calcareous strata,</i>	9
<i>Argillaceous strata,</i>	11
<i>Metalliferous strata,</i>	13
<i>Gold Mine,</i>	19
5. <i>Summit of Lugnaguilla,</i>	29
6. <i>Of the origin and formation of the Mountains, and adjacent strata,</i>	31
7. <i>Rivers and vales,</i>	35

PART



CONTENTS.

PART II.

Agricultural state and circumstances.

	Page.
	44
SECT. 1. Preliminary Observations,	44
Eastern Alluvial district,	46
Powerscourt,	49
State of Manufactures,	53
Price of labour and wages,	54
Food of the poor, and its price,	55
Lodging of the poor. Rent of cabins and ground,	56
Manures used,	57
Glen of the Downs,	63
Mount Kennedy,	67
Marle, and observations on it,	68
Limestone gravel, and pebble limestone, enquiry concerning it,	72
SECT. 2. Western alluvial district,	78
Waste land, and means of improvement,	80
Heathy mountain improved,	87
Important circumstance respecting the cotton manufacture at Stratford- upon-Slaney,	89
3. Central or granite district,	99
4. Southern or Argillaceous district,	100
Parish of Castle M ^c Adam, a minute account of it,	101
Advantage arising from the mines to Agriculture,	108
	Drill

CONTENTS.

	Page.
<i>Drill Husbandry introduced,</i>	113
<i>Barony of Shillelagh,</i>	115
<i>Advantages to this part of the District from the custom of Tenant's-right;</i>	118

PART III.

HEADS OF INQUIRY SUGGESTED BY THE DUBLIN SOCIETY.

CHAPTER I.

AGRICULTURE.

SECT. 1. <i>Mode of Culture,</i>	123
<i>Nature and composition of the Soils in this district and means of their im- provement,</i>	125
<i>New and old Husbandry explained,</i>	128
<i>Manure, its Use and Application,</i>	130
2. <i>Extent of Culture,</i>	136
3. <i>Course of Crops,</i>	141
<i>Best course of Crops,</i>	142
<i>The great principle to be adhered to in Cultivation,</i>	147
<i>Tares, and mode of Cultivating them,</i>	149
<i>Turnips,</i>	156
<i>Rape,</i>	174
4. <i>Use of Oxen—How Harnessed,</i>	176

CHAPTER

CONTENTS.

CHAPTER II.

PASTURE.

	Page.
SECT. 1. <i>Nature of it,</i>	178
2. <i>Breed of Cattle,</i>	182
3. <i>How far capable of Improvement,</i>	<i>ibid.</i>
4. <i>Markets and Fairs for Cattle,</i>	184
5. <i>General Prices,</i>	<i>ibid.</i>
6. <i>Modes of Feeding,</i>	185
7. <i>Natural Grasses,</i>	<i>ibid.</i>
8. <i>Artificial Grasses,</i>	186
<i>Red Clover, the proper mode of Management explained,</i>	189
<i>Laying arable Land down to Grass,</i>	197
9. <i>Hay-making.—Observation and best Mode,</i>	201
10. <i>Dairies, and their Produce,</i>	208
<i>Application of cow milk to the feeding of early Lamb,</i>	209
<i>Mr. Young's account of giving Claret to the Ewes, denied by the Farmers,</i>	210
11. <i>Price of Hides, Tallow, Wool, and quantity sold,</i>	213

CHAPTER III.

FARMS.

SECT. 1. <i>Their Size,</i>	213
<i>Interesting Observations,</i>	216

2. *Farm*

CONTENTS.

	Page.
SECT. 2. <i>Farm Houses and Offices,</i>	219
3. <i>Mode of Repairing them,</i>	ibid.
4. <i>Nature of Leases,</i>	220
5. <i>General state of Leases,</i>	ibid.
6. <i>Taxes or Cesses paid by Tenants,</i>	225
7. <i>Proportion of working Horses or Bullocks to the size of Farms,</i>	ibid.
8. <i>General size of Fields and Inclosures,</i>	ibid.
9. <i>Nature of Fences,</i>	226
10. <i>Mode of Draining,</i>	227
11. <i>Nature of Manures,</i>	229
<i> Paring and Burning,</i>	234
<i> Watering,</i>	237

CHAPTER V.

GENERAL SUBJECTS.

SECT. 1. <i>Population,</i>	240
2. <i>Number and size of Villages and Towns,</i>	241
3. <i>Habitation, Fuel, Food, and Clothing of the lower rank—Their general cost—Price of Wages, Labour, and Provisions,</i>	242
4. <i>State of Tithe,</i>	254
5. <i>Use of Beer and Spirits,</i>	255
6. <i>State of Roads, Bridges, &c.</i>	ibid.
7. <i>Nature of Soil, &c.</i>	256
8. <i>State</i>	

CONTENTS.

		Page
SECT. 8.	<i>State of Navigations, &c.</i>	<i>ibid.</i>
9	<i>— of Fisheries,</i>	<i>ibid.</i>
10.	<i>— of Education, Schools, and Cha- ritable Institutions,</i>	257
11.	<i>— of Absentee and resident Pro- prietors,</i>	258
12.	<i>— of circulation of Money or paper,</i>	<i>ibid.</i>
13.	<i>Farming or Agricultural Societies,</i>	259
14.	<i>State of Manufactures,</i>	<i>ibid.</i>
15.	<i>— of Mills of every kind,</i>	265
16.	<i>Plantations and Planting,</i>	<i>ibid.</i>
17.	<i>Nurseries,</i>	266
18.	<i>Price of Timber and State of it in the County,</i>	267
	<i>Interesting Calculations on this subject,</i>	269
19.	<i>Quantity of Bog and waste Land— Possibility and means of Improv- ing it,</i>	271
20.	<i>Habits of Industry, or want of In- dustry amongst the People,</i>	273
21.	<i>Use of the English Language,</i>	274
22.	<i>Account of Castles, Monasteries,</i>	<i>ibid.</i>
23.	<i>Whether the County has been Sur- veyed,</i>	<i>ibid.</i>
24.	<i>Weights and Measures,</i>	<i>ibid.</i>
	<i>Nature and Use of Implements of Husbandry,</i>	275
	<i>Ploughs,</i>	281
	<i>Cars,</i>	<i>ibid.</i>
	<i>Furze-breaker or Furze-mill,</i>	282
	<i>Conclusion,</i>	283

SUGGESTIONS

SUGGESTIONS OF ENQUIRY

FOR GENTLEMEN WHO SHALL UNDERTAKE THE FORMING OF

AGRICULTURAL SURVEYS.

GEOGRAPHICAL STATE AND CIRCUMSTANCES.

Situation and Extent,
Divisions,
Climate,
Soil and Surface,
Minerals,
Water.



AGRICULTURE.

Mode of culture,
Extent of it, and of each species of grain sowed,
Course of crops,
Use of oxen—how harnessed,
Nature and use of implements of husbandry,
Markets for grain,
Use of green food in winter.

PASTURE.

Nature of it.
Breed of cattle—how far improved,
—————how far capable of further improvement,
Markets or Fairs for them,

General

General prices,
 Modes of feeding—how far housed in winter,
 Natural grasses,
 Artificial grasses,
 Mode of hay-making,
 Dairies, their produce,
 Prices of hides, tallow, wool, and quantity fold.

FARMS.

Their size,
 Farm houses and offices,
 Mode of repairing them, whether by landlord or tenant,
 Nature of tenures,
 General state of leases,
 ——— of particular clauses therein,
 Taxes or Cesses paid by tenants,
 Proportion of working horses or bullocks, to the size of farms,
 General size of fields, or enclosures,
 Nature of fences,
 Mode of hedge-rows, and keeping hedges,
 Mode of draining,
 Nature of manures.

GENERAL SUBJECTS.

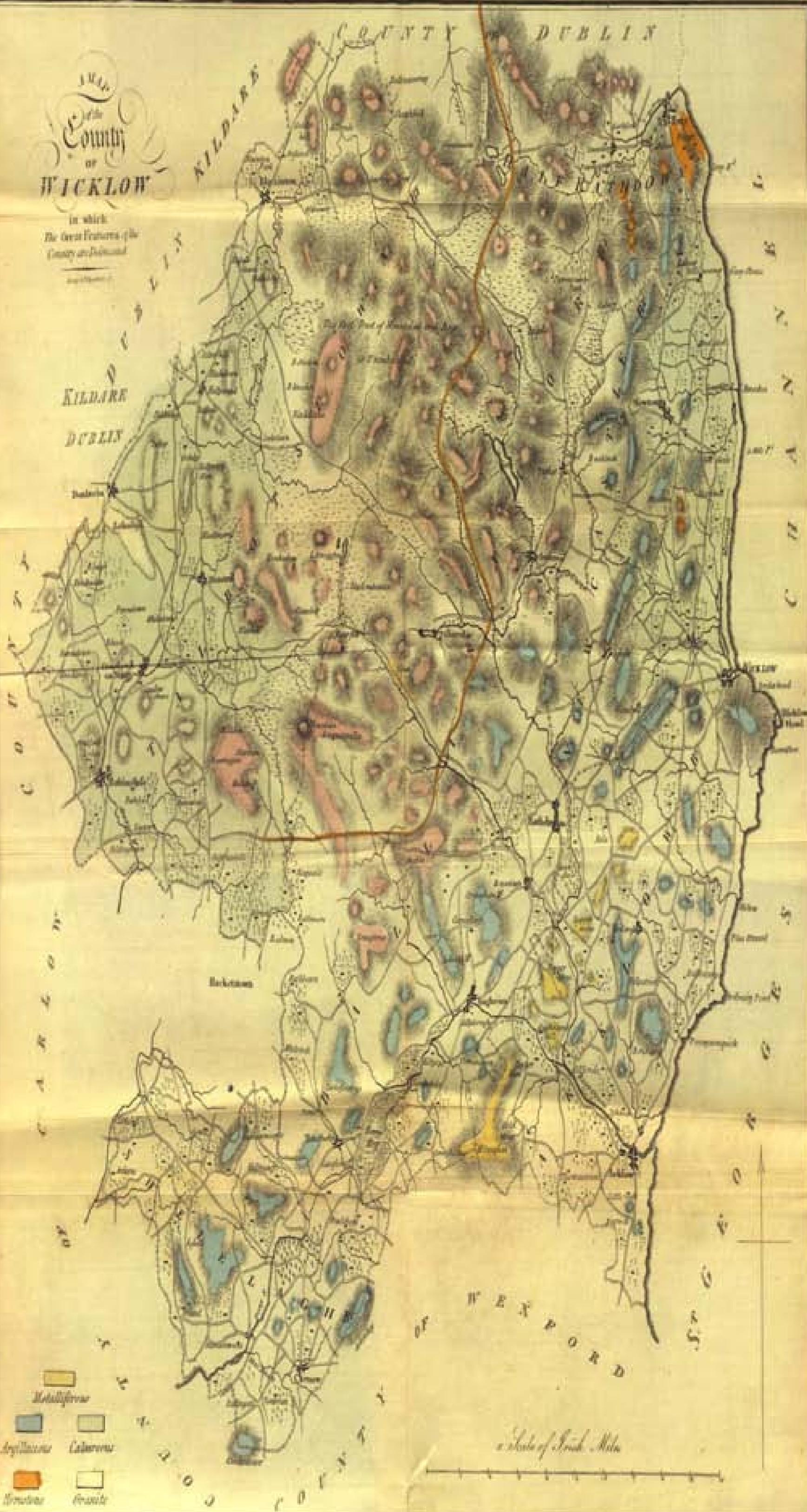
Population,
 Number and size of villages and towns,
 Habitation, fuel, food and cloathing of the lower rank—their
 general cost,
 Price of wages, labour and provisions,
 State of tithe, its general amount on each article—what arti-
 cles are exempt, and what charged by modus,
 Use of beer and spirits—whether either or which is increasfing,
 State of roads, bridges, &c.
 ——— of navigations and navigable rivers,
 ——— of fisheries,

- State of education, schools, and charitable institutions,
 — of absentee and resident proprietors,
 — of circulation of money or paper,
 — of farming or agricultural societies,
 — of manufactures, whether increasing,
 — of encouragement to them, and the peculiar aptness of
 the situation for their extension,
 — of mills of every kind,
 — of plantations and planting,
 — of the effects of the encouragement heretofore given to
 them by the Society, particularised in the list annexed.
 — of any improvements which may occur, for future en-
 couragement, and particularly for the preservation of the
 trees, when planted.
 — of nurseries within the county and extent of sales.
 Price of timber and state of it, in the county,
 Quantity of bog and waste ground,
 Possibility and means of improving it,
 Obstacles to it and best means of removing them,
 Habits of industry, or want of industry among the people,
 The use of the English language, whether general, or how far
 increasing.
 Account of towers, castles, monasteries, ancient buildings, or
 places remarkable for any historical event,
 Churches—resident clergy, glebes and glebe houses,
 Whether the county has been actually surveyed, when and
 whether the survey is published.
 Weights and measures, liquid or dry—in what instances are
 weights assigned for measures—or *vice versa*.
 The weight or measure by which grain, flour, potatoes, butter,
 &c. are sold.

1844
County
 of
WICKLOW

In which
 the Great Features of the
 County are delineated

Scale of Miles



- Metalliferous
- Argillaceous
- Strata
- Calcareous
- Granite

State of Irish Maps
 Scale of Miles

STATISTICAL SURVEY
OF THE
COUNTY OF WICKLOW.

PART I.

GEOGRAPHICAL AND MINERALOGICAL.

SECTION I.

Situation and Extent.

THE country of Wicklow is situated in the province of Leinster, immediately south of Dublin, by which county and part of the county of Kildare it is bounded on the north. On the east it is bounded by St. George's Channel; by the county of Wexford on the south; on the west by the county of Kildare, and part of the counties of Dublin and Carlow.

It extends from north to south thirty-two Irish, or forty and a half English miles. From east to west it extends twenty-six Irish, or thirty-three English miles. The county contains in Irish acres 305,404, in English measurement 494,704 acres.

SECT. 2. *Divisions.*

THE county of Wicklow is divided into six baronies and half baronies.

Arklow barony contains	-	41,721	<i>Acres.</i>
Newcastle,	-	32,403	
Half Rathdown,	-	18,532	
Ballinacor,	-	96,847	
Two half baronies of Talbotstown,		88,683	
Half barony Shillelagh,	-	27,218	

It contains 58 parishes, and 20 churches. Of these 49 parishes and 17 churches are in the archbishoprick of Dublin; 6 parishes and 3 churches in the diocess of Leighlin, and 3 parishes and 1 church in that of Ferns.

A vast tract of mountains, composing almost the whole of the barony of Ballinacor, and a great part of the Upper half barony of Talbotstown, completely divides the eastern part of the county, extending along the sea coast from the western part adjoining the counties of Carlow, Dublin, and Kildare, so that the intercourse is almost wholly cut off between the inhabitants of these districts. To this may be added the remote situation of Shillelagh from either; forming natural divisions very distinct, strongly marked, and as different from each other in general circumstances, as if they were parts of separate and distinct counties.

This

This circumstance of these rugged central mountains, with the fertile borders to the east, west, and south, has made the county of Wicklow be compared to a frize cloak with a laced border, not inaptly designating the manufacture, with which the mountainous part did abound, and pointing out the line of extending improvement into those now almost desolate wilds.

SECT. 3. *Climate.*

WITH regard to the general climate of this county, it cannot differ very materially from that in the neighbourhood of the metropolis.

It is very healthy, and there are many instances of longevity. The eastern part being exposed to the sea, when, during spring, the easterly winds prevail, it is rather cold and chilly in situations not well sheltered; but it does not appear to be in that degree as to injure the vegetation of plants or trees; as the numerous beautiful vales, covered with trees, and with the most luxuriant verdure, fully evince.

In all countries the climate may be improved; this is chiefly to be done by draining and shelter. In this county, except turf bogs, in the mountains, and in some low situations towards the south, there are not any great instances of stagnant water. These bogs are not found unhealthy, like the marshes of England; they produce no agues nor other acute disorders. Far from causing putrefaction, they are possessed of an

astringent principle, which preserves vegetables, trees, and even organized bodies, which happen to be deposited in them.

Shelter, therefore, is the great object for the improvement of the climate in this county, and indeed, throughout the whole of Ireland. By dividing the lands into moderate inclosures, planting hederows, with trees interspersed in the hedges and the fields, not only would the appearance of the country be rendered delightful, but the air and climate highly improved; which, according to late discoveries, would also arise from the pure air, or oxygen given out by these various trees and shrubs, which are now found to occasion from their leaves a great addition of pure air.

Nor is there any thing but such an arrangement wanting to render the county of Wicklow equal, and in many instances, superior to any thing in the united kingdom. It is with pleasure we observe, that this system was rapidly extending before the late unfortunate disturbances, which have greatly checked, for a time, the advancement of these and other improvements in this county; but which improvements, it is to be hoped, will soon be renewed with additional exertions.

SECT. 4. *Mountains and general strata.*

Of a county like that of Wicklow, of which the predominant features are mountains and rocks, it seems necessary to begin a description with attempting to convey some idea of those prominent districts of the country.

An oblong may be measured from Kippure the highest mountain in the north, to Lugnaguilla the highest in the south, being in length fourteen miles. From Blackmoor Hill, on the North West, to mountain Douce, on the N. E. and from black Mountain, on the S. W. to Trooperstown Hill, on the S. E. a medium breadth may be taken of ten miles.

Granite strata.

In the central part of this district erects itself a vast mass of almost continuous granite, covering an area of near 140 square miles, or about 84,000 acres.

A great part of the surface of this space is covered with heath and peat to a considerable depth, underneath which is found a coarse gravel, consisting of decayed granite, the quartz, felspar, and mica intermixed in various proportions. By forming drains down to this understratum, the intervening ground can be freed from superabundant moisture and rendered fit for improving the surface, by burning, or such modes

modes as may be found to be best adapted to destroy the heath, and generate those grasses best calculated for the soil and surface.

But although the general mass of mountain appears to be continuous, there is a vast groupe of rounded summits elevated above the general base, of different heights, and of different shapes. Where, by the abruptness of their sides they are denuded of soil, the compact granite discovers itself. On the highest summit of Lugnaguilla very compressed gneiss is found incumbent on the granite, and seems to arrogate a pre-eminence over her softer sister to primeval hardihood.*

This chain of mountains, to the west and north, is bold and abrupt; to the east it is more frequently excavated into basins and hollows, forming beautiful and romantic vales. Towards the south and west there is also the extensive vale of Imale capable of great improvement.

It is through this mass of mountain that the military road is now forming. By the scientific ability with which it is conducted, it is likely to be a very durable improvement, as well as a most useful road, forming an easy communication from the metropolis through the whole

* The granite is supposed to be of earlier formation than the gneiss, yet at this summit it seems to have withstood decomposition, even exposed to the rains and the storms for unnumbered ages. The top of Lugnaguilla is covered with grass consisting of the sheep's fescue, and a variety of succulent plants; the summit is nearly half a square mile. There is a rabbit burrow on the top, and sheep were in September in good condition.

whole of these mountains.* This road is to be thirty six yards wide; for a great part of the extent it will be a dead level, and in no part any sensible difficulty in the ascent or descent.

By means of this road there will not only be an easy and ready access for the army, to preserve the peace and quiet of adjacent districts, but there will be an opening to Enterprize and Capital to speculate in cultivating these at present uninhabited wilds, and to ornament the many beautiful lakes and vallies, which abound in the midst of this extensive region.

Beautiful rides will also be formed to the adjacent summits, from many of which an extensive prospect is commanded of the beautiful vales of the county Wicklow to the east, the expanse of St. George's Channel, and a distant view of the mountains of Wales.

Proudly on the other side from these summits you command the extensive plains of the midland counties

* Beginning at Rathfarnham they change the road by Mount Venus, by Mount Pelier, Kilakee, to the west of the white sands, leaving Glanasamole to the west, turning over the Feather-bed mountain, leaving Glenduff and Castle-tool to the east, proceeding to the meeting waters at the head of Glencree and on to Lough Bray; leaving Kippure mountain to the west, we go on to Liffey-head leaving the War-hill and mountain Douce to the east; then turning to the west we keep the line of Shranamuck, getting right of which we turn towards Sally-gap in the direction of Clohoge, leaving Luggela $1\frac{1}{2}$ mile to the east; then turning westward it must run N. W. at the back of Logmore to Mullaclevaun and Lognadrough, leaving Carrigenduff to the west, then by Carigachouck, Tonleque, and on to Glenmacanass, leaving Glanenashane to the west, and so on to Glendalough, where we join the high road to Rathdrum, and over the mountains to Glenmalur, and from thence to Aghavanagh.

ties of Ireland, bounded on the south by the rugged Leinster, and on the west by the Cummeras and the Galtees, including a line of country, that can vie with any part of Europe in point of fertility of soil, and capability of improvement.

Whether or not the inert mountain feels that it has opposed its firm texture to the flood, and prevented its retreating torrent from sweeping the subambient plains, it seems from geological theory not improbable, that the eddy, formed by the whole of these ranges of mountains, occasioned the deposition of the secondary strata, which extends through the greatest part of that expanse of country, the view of which we present to the speculative philosopher, and which with due deference, is offered to the consideration of that effective minister, who may have inclination to advance its improvement to that state, of which it is so highly capable.

On the east and south east of this granite country, which we have attempted to describe, is found the micaceous Schistose and Argillite posited on, and adhering to the granite; the former is particularly conspicuous on mountain Douce, near the beautiful waterfall in Lord Powerscourt's deerpark.

Hornstone strata.

From near this a noble ridge of mountains extends itself into the sea, including the two beautiful mountains, called the greater and lesser Sugar loaf. These mountains, so called from their conical shape, and

and the promontory, called Bray Head, consist entirely of hornstone intermixed with quartz, sometimes in blocks variously grained; in others it appears intersecting in veins the hornstone; the whole of extreme hardness. To the north of this ridge of hornstone extends the beautiful vale of the Dargle and Powerscourt, inclosed on the other side by a ridge of granite, extending from Kippure into the county Dublin, towards Killiney Bay. In this ridge is the singular chasm called the Scalp, forming a deep gulley in the ridge of granite.

It appears as if the mountain had sunk into itself: the huge fragments strewed around seem to denote some awful ruin.

Calcareous strata.

Adjacent to this, and in the whole of the intervening valley a phenomenon presents itself, when first observed exciting considerable attention, when afterwards investigated being equally difficult to be explained.

Nor is it confined to this spot, but is found in very large districts both on the east and west sides of the mountains.

This phenomenon arises from an infinity of rounded and blunted limestones found in the strata of the earth, bedded generally in loose marle, and in gravel, of which the chief part is small limestone of various granular dimensions; sometimes the marle is found more compact and indurated.

These

These blunted and rounded pebbles of limestone have every appearance of being so formed by attrition, after having been broken off from some mass of limestone; and as they are found at very considerable heights up the mountains, it might be supposed, that they have been broken off from some mountains of limestone in the internal part of the district.

Yet certain it is, there is no lime rock whatever to be found in the whole of the county of Wicklow, nor any vestige of such rock in the internal part of the mountains.

Proceeding southward from the Sugar loaf, by the border of the granite you find the Argillite Schistose, more or less compact, but the strata more or less broken. Immediately adjacent is Latouche's hill, where extremely abrupt in the west is formed the Glen of the Downs, so much celebrated for its romantic scenery, and exhibiting a chasm of greater extent and width than that, which we have just described. To the south of this a third opening is made in the mountain of Dunran, where it appears also as if some immense rupture had happened to the mountains. At one place a large fragment has slipped from the rest of the mountain and stands perpendicular, amidst a wild confusion of broken rock scattered around. Whether or not these chasms have been occasioned by the reflux of the waters of the deluge from the north, it is singular enough to observe, that they are directly in a line from north to south of each other.

To the eastward of the mountains, until within two or three miles beyond the town of Wicklow, this pebble limestone and marle is found in greater

or less quantities: and whatever has been its origin, it is probable the state in which it appears, must have arisen from the retreating of the waters as in all the gravel pits and banks, where the strata are laid open, you see regular and alternate layers of sand and gravel intermixed with these rounded limestones most likely occasioned by modern deposition, long after the formation of the adjacent mountains.

From whatever cause the origin of these calcareous strata is to be derived, it is to be acknowledged as a gracious present to that part of the country, in which they are deposited. The abundance of that species of strata of marle and limestone gravel, which is frequent in many parts of Ireland, afford peculiar advantages in the cultivation of the Island; nor is there in any part of Great Britain that kind of calcareous stratum, known by the name of limestone gravel, to be found*. It is of all others the most excellent manure for clay soils, and as will be explained in the course of this Report, capable of being employed much more extensively than it has hitherto been in some districts of this country. But this, with the different species of marles, belongs to a future division of our work.

Argillaceous strata.

As has already been explained, this calcareous stratum continues along the eastern coast, and to a considerable height up the mountains, until you proceed
about

* I have heard it said, that lime stone gravel is found in North Wales, but I don't know that it is a fact. I have since found in Darwin's Phytologia, that the Ketton limestone is of the same kind of broken fragments of alluvial strata.

about three miles south of Wicklow. The country becomes here more elevated, consisting of argillite strata, and as you proceed towards Rathdrum, the limestone gravel and pebble limestone entirely vanish. This argillite shistose continues on the east and south-east of the mountains, to the lower part of the barony of Shillelagh, intermixed in some places with the siliceous, but no continuous rocks of granite, although boulders of granite are often found on the surface.

And here it is necessary to explain, that, although we have stated the principal chain of mountains to stretch from Kippure to Lugnaguilla, it is to be observed, the chain is still continued, although more broken and interspersed. Taking different directions, it continues to form a separation of the eastern parts of the county from the plains of the county of Carlow on the west.

This chain, assuming a south-east direction from Lugnaguilla, stretches on the west side by Carrigmile to Askakeay, about seven miles in length, and taking Drumgoff and mountain Croughan for the east border, forming from three to four miles in breadth, in the midst of which mountains are the vales of Aghavanagh and Ballymanus.

From the extremity of this range of mountain at Askakeay, it takes again another and a contrary direction. Stretching to the S. W. 10 miles, a chain of mountains is formed, arranged in single files by Carrigacrow, Coolafinchoge, on to the borders of the county of Wexford, and the county of Carlow, at Ballyredmon. Between all these mountains there are vales, but narrow, and ill adapted for canals, until you arrive

rive at the pass towards Clonegall, where the valley is formed for any navigable canal that may be considered eligible, to communicate from the lime-works and collieries of Kilkenny and Carlow to the vales, which stretch themselves to a great extent on the eastern borders of this extensive barrier of mountains*.

The practicability of such a communication, and the advantages arising from it, will be explained in another part of this work.

We have the pleasure to say, that from the representations already made to the gentlemen of the country, the design of carrying such a navigable canal into execution is taken up, and there is every reason to expect will be carried into effect.

Metalliferous Strata.

Granite, as has been already mentioned, is one of the principal component parts of the primitive rocks and mountains, in the central parts of the county of Wicklow. It seldom happens, that in this species of granite any metallic substances are found. However, as these mountains appear to be intersected in various situations with Argillite, it would be too hasty to pronounce, that they do not contain metallic strata.

In

* Since writing the above, I have found another Pass, where it appears practicable to carry a navigable canal through these mountains, between Hacketstown and the Aghrim river.

In the midst of the granite mountains, of which the forest of Dartmore, in the county of Devon, is composed, are to be found Argillite Strata, containing tin mines of very extensive value, and in two different situations in Cornwall, one in Henkston, and another near Pensance, tin is found in the granite itself; although, in general, the rich mines both of tin and copper are found in argillite. In this county in Glenmalur is found a very rich lead mine in the granite strata, and another vein of lead has been found near the Seven Churches, probably also in granite.

To investigate these strata would require a long time and considerable expence and labour, as it would be necessary, to take away the incumbent earth and clays, and to examine the nature of the rocks and stones; for it is from the nature of the stones, which compose mountains, that we find the best indication of ores; all other marks are very fallacious, and most of them ridiculous. But certainly a minute mineralogical examination of this district would be a valuable acquisition to that branch of science, and might be productive of important advantages to the kingdom.

Copper ore is even said to have been found in the Eagle rock near the Seven Churches.

Whatever metallic riches may be in these internal situations of the mountains, certain it is, that in the argillite strata adjacent on the east and south, very rich veins of metallic substances have been found.

The principal line of this metalliferous vein of country extends in a direction from the hill of Crone-

bane to Croughan mountain, on the borders of the county of Wexford, nearly N. E. and S. W. stretching about ten miles in length, abounding in metallic productions to an extent not by any means fully ascertained, but which in all probability is capable of employing the most extensive capital and an indefinite number of hands.

It is interesting here to remark, that the principal seat of the metallic country in Cornwall is situated in a similar position, at some distance from the granite country, and also in argillite. Nor is this mineral district in Cornwall more than ten English miles in length by about five in breadth*. In one part, on the north east of the Wicklow metallic country are found the extensive copper mines of Cronebane and Ballymurtagh, in the working of both which very large sums have been expended to the great advantage of the surrounding country, from the employment of the people, and the circulation of so much money, as must have been expended in labour and subsistence.

The species of ore found here is copper pyrites. This is the poorest, yet the most common of the copper ores. On assaying it I found it to contain a great portion of sulphur, and a considerable part of iron, with about 7 per cent of copper. The specimen I assayed was from Ballymurtagh. The Cronebane is also copper pyrites. The colour is from lead grey to a yellow colour resembling brass; it sometimes approaches

* See the General view of Cornwall, drawn up for the consideration of the Board of agriculture and internal improvements by the author, an extract from which will be found in the appendix to this Report.

approaches to the colour of gold. The ores are found in solid masses without any determinate shape: the veins of ore in these mines are some times of great breadth. It is generally first picked and sorted, then broken into small pieces so as to separate the ore from the gangue; some samples go, I am told, as high as 10 per cent. At Cronebane they send the ore thus broken to Swansea, or Neath, where it is there smelted and brought into the state of malleable copper. The proprietors of Ballymurtagh mines formerly reduced the ore to copper at Arklow, where they have convenient works upon a large scale for that purpose.

This ore, when moist and exposed to the atmosphere, absorbs the acidifying principle from it, which is accelerated by the assistance of heat; the sulphur, which it contains, becomes thereby an acid, which is diluted by the moisture, and reacts upon the copper, which it dissolves, and with which it forms a salt, namely, the sulphate of copper, or vitriol of copper. From this the copper can be separated in its metallic state by metallic iron. At both these mines this process is carried on, on a large scale, but had for some time been interrupted on account of a construction of some act of Revenue, by which this was considered as manufactured copper. All copper now and since the 1st of January being free from duty, these and other similar works will be carried on with great spirit, and larger capitals employed in opening and renewing the many copper mines in this and other districts of Ireland.

This

This cement water or metallic salt, is partly found collected in the bottom of the mine, from the rain water dissolving and washing down the salt. At Ballymurtagh they formerly used to separate the sulphur, which they collected in a subliming apparatus similar to that at Paris mountain. They now however by applying heat dissipate part of the sulphur; after this they wash the remaining ore with water, which takes up the thus formed saline copper; the copper is afterwards separated by iron plates, so as to be recovered by the iron, which deprives the copper of the oxygen or acidifying principle. The thus collected copper is called cement copper. The ore remaining after the first washing is then taken to Arklow, where it is fused, and afterwards sent to Swansea or Neath, where it is further refined. The Cronebane mines are carried on by a public chartered company. They are conducted with great science and economy by two of the partners, who excell very much in a complete knowledge of mineralogy and mining. These mines have for some years, under the management of these gentlemen, returned a considerable profit; but they have not (hitherto on account of the heavy duty on importation to England) been worked to the extent, of which they are capable, which however they are now preparing to do with great spirit. Last year they exported above 1800 tons of ore. When they have carried hence a deep level they are now bringing up, they will be able to raise double that quantity.

The mine at Ballymurtagh was opened, I am informed, about the year 1755 by Mr. Whaley; of late years it has been renewed, and immense sums of money expended on it by Mr. Camac, with the intention of making a thorough trial of the mine.

A vast deal of spirited work has been done here, particularly a deep level wide enough to admit a small waggon. This was done in expectation of cutting the Cronebane lodes, which are supposed to hold on to this ground, from which it is separated by a valley, through which flows the Ovoca. But, although it has not had the effect of cutting these veins or lodes, this level has drained the works, and from the encouragement, arising from the duty being taken off the ore on its importation into England, and other circumstances, I hope the spirited endeavours of the proprietor, Turner Camac, Esq. will enable him to recover the large sums expended in this work, and to meet with an ample recompence for the losses he has suffered.

Those two works are the only copper mines carried on at present in this county; at Glenmalur is the only lead mine.

There are however other veins of copper, that may in all probability pay well for a spirited trial. In the neighbourhood of Ballymurtagh, it is very probable, that the lodes of the Cronebane mine will be found, and very likely adjacent to Ballymurtagh in Kilcassell, belonging to the Rev. James Symes of Ballyarthur, who is now endeavouring to form a company for that purpose; a thorough trial of which may be made at a moderate expence.

The

The formation of this country being that of hills and deep vallies, there are opportunities from these circumstances, extremely favourable for forming levels at great depths, by which the metallic veins could be worked with great ease; and if a company with an extensive capital were formed, to try the country for a number of miles together by a deep level, to cross the veins, it would be the best mode of proving the actual riches contained in the bowels of the earth, and would not upon the whole waste so much capital as is done by partial and inadequate workings.

It is, in this vicinity, that the extraordinary circumstance has occurred of native gold being found, and which has excited much curiosity and attention. Mr. Graham of Ballycooge, who lives near the spot, on which the gold was discovered, informed me that about 35 years ago, a small piece of gold was found in the stream, about the size of the head of a brass nail. This set many people on the search to try, if any more could be found, and he related to me an entertaining account of a schoolmaster in the neighbourhood, who was so possessed with the idea of gold to be found there in great quantities, that he used to go out in the night in search of it, when the schoolboys played a variety of tricks to the poor man; an account of which formed the foundation of Mr. O'Keefe's little piece, called the Wicklow gold mines. Mr. Graham however assured me he did not believe, that there was any of it to any considerable amount found from that period until the end of August 1796, when a man crossing the brook found

a piece of gold about half an ounce weight in the stream. This was about the 24th of August, and immediately the country people began to make workings in search of the gold, which was continued until the fifteenth of October; when possession was taken of the ground by a party of the Kildare militia, by an order from Government, on which the great concourse of people, who were busily engaged in endeavouring to obtain a share of the treasure, immediately desisted from their labour, and peaceably retired to their homes. Mr. Graham, who was present all the time, and purchased a considerable quantity of gold to the amount of above £.700, from the country people, told me, that according to the best calculation there was upwards of £.10,000 Irish paid to the country people for the gold found and sold on the spot, the average price paid for which was £.3 15s. an ounce, which makes it that 2,666 ounces were found in that short space of time.

“ The workings, which the peasantry undertook, are on the north east side of the mountains Croughan Kinskelly within the barony of Arklow, on the lands of Lord Carysfort, wherein the Earl of Ormond claims a right to the minerals, in consequence, as I have been informed, of a grant in the reign of King Henry the second by Prince John, during his command of his father's forces in Ireland; which grant was renewed and confirmed by Queen Elizabeth, and again by King Charles the second. The summit of the mountain is the boundary between the counties of Wicklow and Wexford, seven English miles west from

from Arklow, ten to the southwest from Rathdrum, and six south westerly from the Cronebane mines, by estimation about six hundred yards above the level of the sea; it extends W. by N. and E. by S, and stretches away the North Eastward to Ballycooge, where shafts have formerly been sunk, and some copper and magnetic iron have been found; and thence to the N. E. extends a tract of mineral country eight miles in length, running through the lands of Ballymurtagh Ballygahan, Tigrony, Cronebane, Connery, and Kilmacoe, in all which veins of copper ore are found, and terminating at the Slate quarry at Balnabarny. On the highest part of the mountain are bare rocks, being a variety argillite, whose joints range N. N. E. and S. S. W. trending to the S. S. W. and in one part include a rib of quartz three inches wide, which follows the direction of the strata. Around the rocks for some distance is found ground covered with heath. Descending to the eastward, there is springy ground abounding with coarse grass; and below a very extensive bog, in which the turf is from four to nine feet thick, and beneath it in the substratum of clay are many angular fragments of quartz, containing chlorite and ferruginous earth: below the turbary the ground falls with a quick descent, and three ravines are observed, the central one of which is the most considerable; and has been worn by torrents, which derive their source from the bog; the others are formed lower down the mountain by springs, which uniting with the former, below their junction the gold has been found. The smaller have not water sufficient to wash away the incumbent clay, so as to
lay

lay bare their substratum; and their beds contain only gravel, consisting of quartz with chlorite, and other substances, of which the mountain consists. The great ravine presents a more interesting aspect. The water in its descent has in a very short distance from the bog, entirely carried off the clay, and considerably worn down the substrata of the rock, which it has laid open to inspection. Descending along the bed of the great ravine, whose general course is to the Eastward, a yellow argillaceous shist is first seen; the lamina are much shattered and are very thin, have a slight hade to S. S. W. and range E. S. E. and W. N. W. Included within this shist, is a vein of compact barren quartz, about three feet wide, and another about nine inches wide, having the same range as the former, and hading to the northward; consisting of quartz, including ferruginous earth. Lower down is a vein of compact aggregate substance, apparently compounded of quartz, ochraceous earth, chert, minute particles of mica, and some little argillite. Lower down, the blue shist becomes more compact, though still laminated; the ground less steep becomes springy, is enclosed, and the ravine shallower, has deposited a considerable quantity of clay, sand, and gravel. Following the course of the ravine, or, as it now may more properly be called, the brook, arrive at the road, which leads to Arklow; here is a ford, and the brook has the Irish name* *agbat enaought* (the river, that drowned the old man,) hence it descends to the Aghrim river, just above

* The ford of metals, mines, or minerals, C. V.

above its confluence with that from Rathdrum; which after their junction take the general name of the Ovoca. The lands of Ballinvally are to the southward, and the lands of Colligore to the northward of the ford, where the blue shistus, whose joints are nearly vertical, is seen ranging E. N. E. and W. S. W. Before the workings begun, the brook had formed its channel down to the surface of the rock, and between six and seven feet wide; but in time of floods extended itself entirely over the valley. Researches have been made for the gold, amidst the sand and gravel, along the run of the brook for near half a mile in length; but it is only about one hundred and fifty yards above, and about two hundred yards below the ford, that the trials have been attended with success. Within that space, the valley is tolerably level, and the banks of the brook have not more than five feet of sand, and gravel above the rock. Added to this, it takes a small turn to the southward, and consequently the rude surfaces of the shistus rock in some degree cross its course, and form natural impediments to the particles of gold being carried farther down the stream. Besides, the rude manner, in which the country people worked, seldom enabled them to penetrate the rock. Their method was, to turn the course of the water, wherever they deemed it necessary, and then, with any implements they could procure, to dig holes down to the rock. By washing, in bowls and sieves, the sand and gravel they threw out, in order to separate the particles of gold which it contained, and from the slovenly and hasty way, in which their operations were performed, much gold probably escaped their search.

The

The gold is of a bright yellow colour, perfectly malleable, the specific gravity of an apparently clean piece 19,000; a specimen assayed by Mr. Weaver, at Cronebane, in the moist way, produced from 24 grains $22\frac{3}{100}$ grains of pure gold and $1\frac{4}{100}$ of silver. Some of the gold is intimately blended with, and adherent to quartz; some of it is said to be found united to the fine grained iron stone, but the major part of it was entirely free from the matrix. Every piece more or less rounded on the edges, of various weights, forms, and sizes, from the most minute particles up to ounces; only two pieces are known to have been found of superior weight, and one is five, and the other twenty-two ounces."

So far I have given an account of this singular phenomenon from Mr. Mills to whose paper in the philosophical transactions for 1795, I must refer the reader for further particulars.

In the end of 1796, or the beginning of the year following, government determined to continue these workings, and issue a sum of money for that purpose, keeping a separate account in the Exchequer of the receipts, that it might be given to whoever might be found to be entitled thereto, and accordingly issued a thousand pounds to Mr. Mills, Mr. Weaver, Mr. King, as commissioners for that purpose. The operations of the commissioners were put a stop to by the rebellion breaking out in May 1798, at which time the money issued by government was repaid, and a sum in hands, with which the workings have again been renewed in September last. The operations have been confined to rewash-

ing

ing the sand and ground formerly gone over by the peasantry, and in opening the ground in various places over blue schistose, proceeding gradually towards the hill. The operations are performed by working the sand and soil in buddles, as in the tin-stream works in Cornwall, afterwards in sieves, until they make use of fine linen and muslin, so that no particle of the gold escapes. There is found in these stream-works, besides gold, much magnetic iron ore, in the form of sand; some grain tin has also been found. Manganese, bismuth, zink, and molybdena, in small quantities, so that we can now number eleven metallic substances, discovered in this district.

On the south of Croughan, gold has also been found. And from the whole of this mountain, consisting, as far as could be observed, from the ravines, of argillite, intersected with quartz, and from copper being found at Ballycooge, it might be very well an object for a company to be formed, to make some bold trials, by driving into the strata of this mountain; and which might either be allowed to be formed by the proprietor, if it belongs to lord Ormond, or his grantee, Lord Carysfort; or be made by government, money being issued to make spirited trials; by which the strata would be fully examined, and copper ore very likely found, that would pay amply for the expence. The circumstance of quartz being found, adhering to the gold, and in some cases* where it has been found

* There are no specimens of this now remaining. The people, who purchased from the peasants what they found, broke off as much as they could of the stone, that they might not have to pay for it as gold.

in beautiful and regular chrySTALLIZATIONS, afford a very considerable presumption, that these pieces have been broken off from some vein in the mountain bearing gold. From the same analogy, we should expect tin also in this mountain. In Cornwall and Devon however, although in general, all stream-works are in the adjacent country, to where veins of tin are found in the higher mountains, yet it is certainly a curious fact, that there are vestiges of stream-works, particularly in the forest of Dartmore, where no lode or vein of tin is to be found, nor from all I could observe, is there any probability of being found. So that the tin found in the clay and gravel, washed in these stream-works, does not appear to have been broken off from any lode, nor otherwise to have existed, but in the state of grains and sand, as it is now found, in some of the lower grounds, and the mouths of rivers, where it has been washed down by the rains and storms with the soil, clay and gravel, from the surface of the mountains.

Still, however, it is possible, that the clay and gravel on the forest of Dartmore, where the stream-tin has been found, have only been the decomposition of mountains still higher than those, which at present exist, which rocks or mountains might have contained in their veins or fissures the stream-tin, dispersed afterwards amongst their detritus or decomposition.

From whatever cause the gold found on Croughan may have originated, it appears to me very improbable, that it should wholly be confined to the very small space, in which the country people worked, and it must happen, that much of it has been washed down
the

the rivulet into the Aghrim, and from thence into the Ovoca. Towards the mouth of this river, which empties itself into the sea at Arklow, there is a large flat space of ground, covered by the water in time of floods, and forming a kind of island, which arrests the current of the river, and on which naturally would be deposited a considerable part of what the river might bring down from the mountains, before it carried the residue into the sea. In this ground it is not improbable, that much of the gold brought down will be found, and a trial by streaming would be very much worth attention.

On the southside of Croughan, where, I am informed, gold has also been found, scarcely any trial has been made, and here there being no river to carry the treasure into the sea, search might be made with great probability of success. Nor is it improbable, that gold may be found in other parts of this county, and in other districts of Ireland. It is well authenticated, that the natives of Ireland were found to wear a variety of ornaments of gold, at a time when gold was not known to be found on the continent of Europe. Mr. Hume has a gold watch, said to be made from gold extracted from the copper of this county, by his grandfather, but which in all probability, (as I have never known copper ore contains gold) was from native gold, found adjacent to some copper ore.

From Chroughan to the S. and W. there is an interrupted chain of high mountains, dividing the county of Wicklow from the county of Wexford. These I had not time to examine; one of them I ascended,

Sleeve

Sleeve Bowee. It was covered with foil and grass, nor did I perceive any ravine to enable me to examine the rocks, of which it might be composed. Near the summit, where some trial had been made for slates, I found the siliceous shistus, and some hornstone.

I was very desirous to examine the mountains on the west side of the county, particularly where the granite mountains end, and the argillite appears incumbent on those primitive rocks. In these situations, I should be inclined to expect metallic veins, particularly where quartz is found in the interstices or fissures of these rocks. Mr. Wainright was so good as to accompany me in several of these examinations, and pointed out a variety of situations where trials has been made, and some expectations formed of finding metallic veins. In some of these we found the ochraceous iron ore, and in the ravines on Askakey, and other mountains I found frequent veins of quartz pervading the argillite. But although several chalybeates, and nodules of iron ore, abundance of that metal, I did not find any traces of the nobler metals. The extensive valley of Aghavanagh and Ballymanus, and the numerous lesser vales, amidst the mountains around the primitive granite, I had not time to explore. These vales are circumstanced in a very similar manner to Glenmalur, where lead ore in great abundance is found. I should therefore think the whole of that country deserving careful examination. The mountains to the S. and W. of Askakey, which I have distinguished, as being arranged in single files, appear to me to have their strata (consisting of shistose argillite, and fragments of quartz,) too loose and broken to be likely to hold the more valuable
metallic

metallic ores. Nor in any part of this country did I find any rocks or stones of modern formation, nor any traces of limestone.

SECT. 5 *Summit of Lugnaguilla.*

MR. Hume's kindness, and his assiduous attention to furnish me with every means of being acquainted with the country, induced him to pitch a marquee on the top of Knocknamunion, a very high mountain, at the head of the glen of Imale, where we continued some days, and I had a convenient opportunity of choosing a clear atmosphere for exploring the extensive mountain of Lugnaguilla, from the summit of which you obtain by far the most expanded view of the whole range of mountains and adjacent country*.

On one side you behold an immense groupe of formidable mountains, rearing their dark and rounded summits, like the rolling waves of the stormy ocean. Over these Kippure, and the greater Sugar Loaf, evidently claim the pre-eminence, and form, far distant in the azure sky, a majestic termination of the view.

In some measure is relieved the solemn grandeur of this mountain scene, by the verdant lawns and shady woods of Belview, seemingly here attached to the sloping declivity of the Conical mountain. Pleased with the effect of this scenery, you are wistfully to search for a view of the beautiful grounds around the elevated mountain of Latouche.

The

* It has been found since, that twenty armed rebels were concealed in a cave within a quarter of a mile, where we had pitched our tents, during the whole time of our continuance on this mountain.

The prominent features of Dunran hide the whole circumjacent country, even the varied and verdant downs of Mount Kennedy.

Forming the base of this perspective representation of Bellview, the projecting summit seems to hold up the charms of this feat of benevolence and genuine taste, as an object of peculiar admiration, well suited to the sublime ideas, which naturally inspire the mind, in contemplating the lower world from the heights of Lugnaguilla.

When, with some reluctance, you are able to pass from this distant but interesting scenery, turning the eye near the base of the mountain, you feel yourself astonished with a variety so extensive of hill and dale, of verdant woods and chrystal streams, that for a moment you are led to imagine, you have been suddenly transported into some region of unknown novelty and beauty.

The effect of the perspective, from so elevated a station, renders it difficult at first, amidst the variety before you, to recognize even the well known beauties of the lovely vale of Rosanna.

The eye wandering with delight through the sylvan scene, continued on the verge of the mountains, is suddenly arrested by the splendid banks of the Avon and Ovoca, extending themselves as it were, from the foot of the mountains, on which you are placed. The elegant improvements of Avondale, the neat cultivation of Kingston, the elevated situation of Cronebane, with its square tower, from no other point of view are to be seen with so much advantage. The gaiety these add to the scene, affords a most pleasing sensation, while

while the groves of Bally-Arthur appear waving in the back ground with excellent effect, and force the eye to recoil from the dreary sands and destitute aspect of the too much neglected harbour and village of Arklow.

SECT. 6.

Of the Origin and formation of the Mountains and adjacent Strata.

To those, who live in plains or amidst hills, covered with foliage, and perpetual verdure, the continued source of pleasure, which their beauty affords, prevents the mind from searching into the origin, and formation, of that which produces sensations so delightful.

The grandeur of high and elevated mountains, the forcibly broken and interrupted strata they frequently exhibit, the minerals with which they abound, the valuable metallic treasures these frequently contain, excite the inquisitive mind to investigate the opinions, which have been formed, of reconciling these apparent irregularities to the general order of nature.

Few countries exhibit more interesting inducements to such enquiries, than the county of Wicklow.

It would require years instead of months, to describe the interesting objects it presents, with regard to mineralogy and geology. All that can be expected in this sketch, is only some leading observations, which naturally present themselves on the general consideration of the subject.

To make an ostentatious display of learning, by giving an account of the various theories, which have been formed, respecting the origin and formation of mountains and mineral strata, is by no means the intention of this sketch.

It is sufficient to observe, that it is impossible to contemplate the appearance of the mountains and general strata of the county of Wicklow, without being persuaded, that they must have been affected by violent concussions and ancient revolutions of the globe.

The granite, as has been already observed, is one of the principal component parts of the mountains and rock in the county of Wicklow, which I have therefore denominated *primitive rocks or mountains*, which is a term made use of to denote such as are apparently of greater antiquity than those, which generally rest upon them.

The established opinion seems to be, that they were formed by precipitation or deposition. Their compact state arises from the attraction and cohesion of component parts brought in contact, when they were all or a part of them in a fluid state, or when they were cemented by heterogeneous substances, and that heat was occasionally employed.

Granite is chiefly composed of quartz, feldspar, and mica. The component parts are generally irregularly mixed, and of various sizes.

The quartz and mica are found of different degrees of hardness and colour.

The granite is found very useful, on account of its hardness, for various purposes in common life. The granite splits easily by wedges, taking the grain, according to the flat position of the scales of the mica.

The

The primitive granite seldom contains metals, but that of a secondary formation contains shorl garnet, and sometimes metals. Of this kind is evidently the granite in Glenmalur, in which lead is found, and abundance of garnets, and shorl.

There may be much more of this species of granite in these mountains, and which would be a good indication of metallic substances.

Argillaceous Shistose.

This stone, which composes also a great part of the rocks and mountains of the county of Wicklow, is likewise formed by deposition or precipitation. It is also under the class of primitive rocks, but considered of secondary formation, and there is an argillaceous shistose of wholly modern formation. This rock, as it is generally found in the county of Wicklow, is chiefly composed of common clay, and is found in alternate order with the granite, and is very metalliferous. It composes the greatest part of the strata in the east, and south-east districts of the county.

Calcareous strata, consisting of marle, rounded limestone, and limestone gravel.

There is a species of limestone belonging to the primitive rocks, which is found incumbent on granite. I have not been able to discover any of this stone, either primitive or modern, in these mountains, altho' around them, abundance of rounded fragments of

limestone is to be found. These certainly must be considered as ALLUVIAL, and of a much later formation than the adjacent primitive rock, probably arising from the limestone being decomposed in water; part of it broken into fragments, forming these pebbles of limestone and the gravel, and the rest into loose calcareous earth, uniting with clay and sand, forming marle.

Turf is also to be considered as of ALLUVIAL formation, and is found on the mountains, of considerable depth, apparently consisting of fibrous roots, mosses and grasses, left there on the secession of the waters. It is more or less impregnated with petroleum, and of different kinds, from the brownish-black to the very black, and more solid. This kind, which answers best for fuel and other purposes, is chiefly found in moor ground, and low situations*.

The importance of turf, as a manure, has not been sufficiently attended to, nor has the fertilization of turfy soil been sufficiently pursued, at least in this county.

The peat or turf, which constitutes the solid part of morasses, whether on low or high situations, may be laid on clayey or sandy soils, with the greatest advantage, and ought to be considered as an inestimable treasure to the farmer in its vicinity; or it may be previously laid in heaps, and thus mixed with air, and drained from water, for further decomposition, with the addition of lime, if easy to be got, or even without it.

SECT.

* I have, since writing the above, found much of the black turf in very high situations in the mountains.

SECT. 7. *Rivers and Vales.*

THE mountains of the county of Wicklow give rise to many beautiful rivers and streams, which plentifully water this and the neighbouring counties.

Here takes its rise the Liffey, proceeding to the west and north, and emptying itself into the bay of Dublin, watering an extent of above thirty miles, the greater part of which is a country highly cultivated; in others, which remain almost perfectly waste, the abundance of limestone, gravel, and marle, holds out tempting rewards to the industry of man.

Two small streams, one from Kippure, another from Sally-gap, disputing which may be the source of the Dublin river, unite their streams below the iron mills at Shranamuc, within a mile of Sally-gap. At this summit, the course of the water takes an eastern and opposite direction. A very slender stream proceeds to Lough-tay, which forms a beautiful basin of about three miles in circumference, situated at the bottom of most stupendous and craggy mountains, one of which presents a most formidable appearance of an inaccessible precipice. On the other side, it seems overhung by a bold and rugged mass, with mountains upon mountains piled around. Passing on from the Gap by a narrow defile, on the summit of this mountain, with the lough immediately below, you are astonished at the perception in the bosom of this rugged crater,

of a polished surface of the most verdant meads, interspersed with a variety of the leafy tribe. Curiosity is on the wing to form a conjecture of the friendly hand, which has relieved, with such delightful scenery, this forbidding waste. The enchantment is fully explained, when you recognize, in opening on the view of Luggela, the hand of a Latouche.

From Lough-tay, the nascent source of the classical Ovoca assumes a bolder pride, advancing to Lough-dan, half hid within his winding rocks, mourning the neglect of his romantic scenery, he sends forth the favoured stream with collected forces.

The vale of Glendalough, or the Seven Churches, contributes to encrease his tide.

In this sequestered vale learning is in the early ages said to have kept its seat, when ignorance and superstition had overspread the rest of Europe.

Glendalough literally signifies the valley of the two lakes, and in the bull of Lucius III. is called *Episcopatus insularum*; the bishopric of the Isles.

Glendalough was an ancient episcopal see, and a well inhabited city, till about 1214, when the see was annexed to the diocess of Dublin, and the city, memorable for its religious edifices, not only suffered decay, but insensibly became a receptacle for out-laws and robbers. How excellent would be the revival of this seat of learning, by founding a city in this delightful spot! How infinitely more fitted for the instruction of youth, than the tainted haunts of a dissipated metropolis!

It was long before the Archbishops of Dublin could extinguish the enthusiastic veneration for this venerable spot,

spot, nor, indeed, could they even obtain quiet possession until 1479, in which year on the 30th of May, a surrender was made in the cathedral of St. Patrick, by friar Denis White, who had long usurped that see, in opposition to regal authority. From this æra Glendalough has continued a desert.

A beautiful green plat-form extends itself in the interior of the vale, with a fine piece of water passing through the mountains on one side, and the others almost closed by an amphitheatre of mountains covered with verdure, at the foot of which, flows a chrystal stream. Here are the ruins of the Abbey founded by St. Kevin, and the seven churches celebrated through so many centuries, although their vestiges are now no more. The round tower of the cathedral still remains in fine preservation, and measures one hundred and ten feet in height; it is uncommonly well built, the roof alone having suffered by time.

As the new road will form an immediate communication between this romantic spot, and the city of Dublin, it would more than any thing tend to extend civilization and culture into these wilds, if a town were founded in this central spot, and a small fort or garrison, to protect the inhabitants, and the adjacent country. And we hope this desirable object will not be unattended to, amongst the improvements, which it would seem to be the disposition of government, to make in this neglected part of the country. Glendalough by the present road is about twenty four miles from Dublin, of which about nine are along that part of the mountain extending from Powerscourt deer-park. The land on each side of
this

this road is all of it capable of great improvement, particularly by planting. Before the late disturbances several beginnings were made to improve and build in this district. Near the churches, Mr. Hugo, Mr. Frizelle, Mr. Critchley, and Mr. Weeks had made some plantations, and built several houses, which were burnt by the rebels, but I understand they intend soon to re-build, and I have no doubt, that the many romantic and healthy situations amongst these mountains will become favourite spots for building and improving.

From Glendalough our river, under the name of the Avon, proceeds through the vale of Clara, on one side of which is an extensive wood, the property of Lord Fitz-William. All of this vale is capable of being highly ornamented and improved; it extends between five and six miles to Rathdrum, adjoining to which a beautiful example is exhibited of what can be done in this country, in the improvements of Avondale, made by the late Colonel Hayes, a name truly endearing to all, who feel the enthusiasm of extending zeal for the rural arts.

Avondale, which was bequeathed by its late proprietor to Sir John Parnell, Bart. is proudly situated on the banks of the *Avonmore*, which name, signifying the great winding stream, corresponds most happily with its character, the banks continually forming the finest waving lines, either covered with close coppice woods or with scattered oak and ash of considerable growth; the ground in some places smooth meadow and pasture, and in others rising in romantic cliffs and craggy precipices. The demesne of Avondale

dale enjoys this diversity of scenery in the highest perfection. The house, which was built by the late Mr. Hayes, is large and remarkably well finished. On the front and one side lies a smooth lawn, variegated with clumps and single trees, gently rising to a hill, crowned with large beech, and remarkably well grown fir, particularly the spruce, whose branches hang to the ground extremely picturesque. On the back of the house, the ground in some parts slopes down with a gentle declivity, in others falls in steep and abrupt precipices, covered with old oak, the roots of many of which are 100 feet perpendicular over the tops of others; whilst the grotesque forms of the rocks, covered with ivy and moss-grown roots, vie with the variety of natural wood flowers, and several curious plants, to render the scenery at once pleasing and romantic; a walk winds down through this wood, and some plantations of very large Weymouth pine and larch, to a vale of considerable breadth; on the farther side of which the Avonmore glides with a smooth and gentle current, and at others dashes over huge masses of rock and broken granite, with the foam and rage of a cataract; on the other side the banks rise to a great height, covered thickly with oak woods, here and there indented by the well cultivated meadows of Mr. King, who seems strongly to have imbibed the spirit of his late friend and neighbour.

This vale extends above two miles with every possible variation of form; the woods in some places closing up the river, in others receding, so as to leave meadows of several acres on its banks; where the
 natural

natural wood has been too thin, the late proprietor has not spared any expence to supply the defect with every foreign and domestic tree, which suited the soil and climate, and perhaps no part of Europe admits of greater variety than this part of the county of Wicklow.

A carriage road is conducted a considerable way with attention to the surrounding views; and about a mile from the house, adjoining the wood-ranger's lodge, in a most sequestered spot, is a room in the form of an old English cottage, for dining in on rural parties; it is built close to the river, over a remarkably deep and solemn part, backed by a rock, above 300 feet high; his rugged cliffs fringed with oak, mountain ash, and holly. The bold contour of the surrounding hills, the picturesque simplicity of the rustic edifice, and the burst of the torrent from under the high rock, can never fail to give perfect satisfaction to the admirers of nature and her romantic scenery.

From the wood-house, the drive may be continued through the woods of Avondale to the bridge, at the meeting of the waters, where it falls into the high road to Arklow.

The whole of the continuance of the vale from thence to Arklow, is for its extent the most beautiful that can be imagined.

Here the Avonmore meeting with the Avonbeg or little Avon, the united streams assume the name of *Qvoca*, passing on to Bally-Arthur, the seat of Rev. James Symes, remarkable for the finest growth of oak, in this part of Ireland,

Bally-

Bally-Arthur, on account of its magnificent scenery, the grandeur of its waving groves, and its variety of beauty, well deserves a most minute description. But when we add to this, that the present proprietor has with a degree of science highly meritorious, applied himself to the management of woods, which he has reduced to a most correct and instructive system, to the cultivation of lands hitherto waste, with the great taste and correctness, we must beg to defer giving the particular account of those interesting circumstances in this part of the work. and reserve it for the agricultural description of that part of the county.

From Bally-Arthur, the Ovoca passes through the woods of Lord Carysfort, which, from their neglected state, and the lamentable wastes on the banks of this beautiful river, form a perfect contrast to Bally-Arthur. Passing by Shelton, remarkable for its wood, a beautiful situation, it empties itself, through a bridge of 19 arches, into the sea at Arklow, where it still maintains the character given it by Ptolomy* of keeping its stream distinctly marked from the sea, for near half a mile from the shore.

Besides these rivers, the *Liffey* and the *Ovoca*, the river *Slaney* also takes its rise in these mountains on the west; issuing from Lugnaguilla and the table mountain, it waters the extensive vale of Imale, in
which

* This I had taken from a quotation in Giraldus Cambrensis, but am since informed by Dr. Whitelaw, that although Ptolomy does mention the name of this river as the *Ovoca*, he does not mention this other circumstance, quoted by Giraldus, which however was remarked to me as a singular fact in time of flood.

It is curious that the *Ovoca* should still retain the name given by Ptolomy,

which limestone gravel and marle is found from the very bottom of the mountain. This vale, which is six miles in length and from three to four broad, is capable of the highest improvements; it is by far the most extensive vale in the county. The Slaney proceeds from thence by Stratford, Saunder's grove, and Baltinglass to the county of Carlow. From thence, proceeding through the county of Wexford, it empties itself into the sea at Wexford. On the whole of the banks of the Liffey and the Slaney are abundance of the alluvial strata of limestone gravel, pebble limestone, and loose marle.

The Ovoca alone boasts not of these treasures, nor from its source to its emptying itself into the sea, have I been able to find any trace of alluvial limestone. There is, however, marle in some places, and more may be found; but as far as has been tried, I am told it does not answer as a manure, it efferverces with acids, but time did not permit me to analyse it*.

But it is not on account of the beauty alone, which plentiful streams add to a country, that their value arises, nor merely for the purposes of irrigation, which in improving the adjacent land is often extremely extensive.

These streams of the county of Wicklow afford ample opportunities for erecting machinery, both for
the

* Since writing the above, I have found marle at Bally-arthur on the banks of the Ovoca, which contains 34 per cent. of calcareous earth, and has been found a most excellent manure. A most interesting anecdote was told me of the application of this manure to a small field, which produced the owner so good a crop that it saved him from ruin, and re-established his circumstances. Marle I am also informed has recently been discovered near Rathdrum.

the purpose of working the mines that may be found, and breaking and washing the ores, as also for the more important and extensive object, of employing the people in various branches of manufacture, particularly in the woollen manufacture, of which the great extent of mountain is highly capable of producing the staple to a considerable amount, by stocking those grounds with the breeds of sheep, best adapted to the soil and climate.

Besides those principal rivers we have noticed, there are many others, containing abundant water and good falls for machinery.

The *Inniskerry* and the *Dargle*. The *Vartrey* in the valley of Rosanna. The *Avonmore* and *Avonbeg*. The *Agbrim*. The *two Derrys*. The *Tinahely*. The river near Hacketstown. The *Deerin*. A stream near Hume-wood. The King's river falling into the Liffey near the seat of the Earl of Miltown, and several others are well fitted for machinery, and in many situations there is abundance of turf for fuel, particularly on the river at *Tinahely*.

GENERAL VIEW

OF THE

COUNTY OF WICKLOW.

PART II.

AGRICULTURAL STATE AND CIRCUMSTANCES.

At prius ignotum ferro quam scindimus æquor
Cura sit, ac patrios cultus habitusque locorum
Et quid quaeque ferat regio et quid quaeque recuset.

VIRGIL

ABSTRACTLY to explain such observations, as have offered themselves on the different heads of enquiry suggested by the Society, would perhaps be deemed sufficient to fill up the following pages of this report.

To enter however into some detail of the circumstances, which may have been presented to my understanding in the course of this examination, although in some respects deviating from the arrangement formed by

by

by the Society will, I hope, be received with candour.

To change the concurrent association of ideas is not always easy, nor perhaps, by breaking the narration of things naturally connected in contiguity of time or place, would we be so well able to exhibit in this general view a variety of objects, on which it may be desirable to obtain further information, at a future period.

The outline already attempted, of the geographical and mineralogical state and circumstances, of this district, can be considered little else than a notice of those general objects, which have appeared in themselves interesting, and well worthy the minute investigation of men of superior ability and extended science.

Particular points under both these heads, I shall in the sequel have further occasion more minutely to describe, but to exhibit any thing like a perfect delineation of the mineralogy of this interesting district, would require a long period of time and much labour and research.

In those enquiries more immediately connected with agricultural improvements, to endeavour to make a feeble essay to introduce, in aid of the culture of the soil, the extended acquirements in mineralogy and chemistry can only, it is hoped, be decried by those, whose ignorance of those branches of modern science, do not allow them to perceive their connection, with the perfection of husbandry.

It must, we would presume, appear to all, even to those most acquainted with those subjects, that some
knowledge

knowledge of the composition of soil, and of the various earths, and stones, which may be converted into the means of fertilizing the land, is at all times desirable.

It has been asserted by Physicians, that every climate contains the remedies, to which the human frame is thereby subjected. It may perhaps with equal truth be averred, that every country contains those substances, by the proper application of which the imperfections of its soil may be meliorated, and its surface rendered more fruitful.

In many instances the beneficence of nature has placed these inestimable gifts open to the hand of man. In others it requires diligence and research, nor often are they to be commanded without much labour and expence. An intimate knowledge of the various manures, and the best means of their application to the various kinds of soil, is still far from being reduced to a regular system and decisive rule.

To view agriculture as a mere mechanical operation, and to expect its ultimate improvement from the *bare recital* of practical opinions or even approved modes of cultivation, without *endeavouring to find out some permanent principles*, often tends more to bewilder and *mislead*, than to enlighten and instruct.

SECT. I. *Eastern alluvious District.*

The county of Wicklow we have already described as being separated on the north from the county of Dublin, by a very elevated range of mountains stretching

stretching from Kippure, and the central mass towards the bay of Killiney.

In the midst of this formidable barrier appears a vast chasm, called the Scalp. It would seem, as if here the foundations of the mountain had given way, and the mountain sunk into itself. The prodigious fragments hanging on the precipice threaten dreadful ruin, ready to hurl themselves amid the huge masses of granite scattered in wild confusion at its base.

With somewhat like the grandeur of Roman labour, a road has been formed through those ruins of the mountain; in many places by rolling back with vast force blocks of the compact rock, erecting as it were a kind of entablature, to arrest from the passing traveller the progress of impending danger.

From hence entering the county of Wicklow, the sugar loaf mountain rears in the front its conical summit to the clouds. On the west and north presents itself a magnificent amphitheatre of primitive mountains, in the bosom of which is extended a district of country, highly interesting from its peculiar circumstances and singular beauty.

Proceeding on each side from those primitive mountains, the rocks, of which they are composed, gradually disappear; the internal space seems wholly filled with the deposited spoils of alluvions long subsequent to the formation of the surrounding mountains.

On the left of the road from the Scalp, a section of this strata presents itself, through which the road
seems

seems to have been cut in descending to the rivulet and village of Inniskerry. In this bank a vast body of gravel and rounded fragments of various stones appear, amongst which are to be seen rounded and blunted fragments of limestone of various sizes, from coarser gravel to rounded pebbles of considerable magnitude. In some situations they appear almost cemented into a solid rock. In others the strata alternates with layers of siliceous earth. In the ravine below, through which the Inniskerry has worn its course, the same stratification occurs, with at great depths regular beds or layers of marl and argillaceous earth.

Ascending from the ravine through the village of Inniskerry, you enter the extensive demesne of Lord Viscount Powerscourt, whose noble mansion is situated in the centre of this district, and from which it derives its name. To the south of this elevated ridge opens to the view an extensive vale, through which a beautiful stream winds its course almost hid with the foliage on its banks. The well disposed woods and lawns in the sloping ground in front of Powerscourt house, the finely wooded demesne of Charleville on the opposite banks belonging to Lord Monck, afford a most luxuriant scene, while the woods around the villa's of Bushy Park and Ballgornan, rising on the opposite mountain, add highly to the scenery you behold.

On the other hand Tenehinch the beautiful seat of Henry Grattan, Esq., the fine lawns and woods leading to the romantic beauties of the celebrated Dargle, altogether conspire to render this situation one of the most interesting any where to be seen. The interest in which is not a little enhanced by the

view

view of the cottage, where it is said were assiduously cultivated the principles of that persuasive eloquence by which the FRIEND OF THE PEOPLE in the senate so powerfully commanded the minds of men.

Lord Powerscourt's demesne consists of near 600 acres. Except a very small part, the whole is in meadow and pasture interspersed with well disposed wood and clumps of trees; the soil varying from very light sandy to gravelly and clayey loam. Remarkably fine herbage is here produced, either for sheep or cattle. The upper part of it, from being covered with heath and boulders of granite, is converted into one of the finest sheep walks that I have any where observed, a sufficient proof of what might be done with vast tracts of ground in this neighbourhood, at present in the same unimproved state, as that, from which this has been reclaimed.

In all parts of this demesne, except the part, which I have just mentioned, and which rises towards the primitive mountains, the same strata takes place, that I have already described, and also in the adjacent grounds on the banks of the Dargle at Charleville and Ballyornan.

The abundance of calcareous earth, which is contained in this strata shows itself by a curious circumstance, which takes place very generally on the sides of the elevated ground I have spoken of, as forming part of the demesne of Powerscourt. On the moss growing on the slopes is to be seen stalactites of pure lime, deposited by the water oozing out on the surface. What advantages might not arise from irrigating more generally with this water? In one

situation this has been done on the lawn before the house with the greatest advantage.

To describe all the beauties of this finely situated ground, would much exceed the bounds of this work.

At the south west, passing through the demesne, is the deer park and waterfall, forming a beautiful valley compleatly inclosed by high mountains, over the face of which falls abruptly a fine piece of water, at the foot of which is spread a fine velvet carpet of verdant turf. The stream, murmuring over its rocky bottom, winds round its elevated banks amidst a vast wood of full grown timber. At some distance from this secluded spot, to the north west is Glencree, or the vale of my heart, formerly entirely covered with wood. This fine vale extends for several miles to Lough Bray, and contains much land capable of considerable improvement.

What, independent of its grandeur and beauty, renders this district peculiarly interesting, arises from this estate of Powerscourt containing for its extent a greater number of respectable yeoman tenantry, than perhaps any of equal extent in the county. Of these there were no less than ninety-four, who with four officers kept guard at Powerscourt House, from the 6th of May 1798, for 18 months, and preserved the whole country safe from the depredations of the rebels and banditti, who infested the adjacent mountains; Lord Powerscourt himself constantly doing duty along with them, the greatest part of the time a subaltern in the corps. All his tenants have leases for 3 lives or 31 years, which ever last longest.

Their

Their farms are from 150 to 200, and some 300 acres.

The lower grounds are inclosed and chiefly in pasturage. Theory and practice, it must be confessed are perpetually at variance, as well in agriculture as in many other subjects of investigation. It might at first appear, that the custom of granting leases for three lives (a tenure, that gives such probable security to the tenant) would excite a great degree of spirit of improvement amongst the holders of these tenures. Experience however proves the contrary to be fact. For leaseholds on lives are, generally under, the most wretched cultivation.*

Easy rents may have produced a careless indolence, and hence an aversion to enterprize. The landlord having but little interest in such estates, and less power over such tenants, is himself checked from any spirit of improvement, upon such contingent property. Those proprietors who look a little towards the welfare of posterity, are come to a resolution of running those tenures out, and of course the tenants are not behind in exhausting and every way impoverishing the land. This is productive of very mischievous consequences to agriculture, and, if possible, proprietors ought to make some exertions both to excite industry, and to give assurances of reasonable renewals to improving tenants.

On this estate, of the whole lower grounds there is scarcely an acre, which might not be brought into the

* This remark I have had formerly occasion to make in my general view of the county of Devon and the same holds good in this county.

most improved garden culture. The tenants, to do them justice, do not in general run out the ground. The fine pasturage it affords, enables them to maintain their families with ease, and they make little or no use of the rich marl and limestone gravel, which is almost in every field to be found, than which with proper application no culture pays more abundantly.

Instead however of this proper application, when they do make use of their valuable manure, it is the common practice to take as many crops of grain following each other, as the land will bear. It is then, as they term it, turned out to rest, without any fallows or fallow crops to cleanse it from the weeds, with which it abounds. In that state it remains, until the soil in some degree recovers its natural fertility, which it does wonderfully in a few years, throwing up a vast quantity of the best natural grasses. Some have gravely assured me, that clover, and other artificial grasses, will not grow in their soil. Nor indeed can it be expected, that land, thus worn out by repeated crops of grain, and full of the seeds and roots of all kind of weeds, can produce those grasses; the soil in that state, capable of producing nothing but weeds, wholly refuses to bear the more nourishing plants, or if some remaining fertility affords them birth, they are speedily stifled by the riotous product from the rubbish of the soil.

This censure is far from attaching itself singly to this estate; in the whole range of land, belonging to other proprietors, to the sea, and beyond this insulated part of the district, through the whole of this alluvial country the same indolent mismanagement seems generally

generally, with few exceptions, to prevail; those exceptions are seldom to be found but on lands, the property, or, what amounts to the same leases for ever, is invested in the occupier. Indolently existing on the natural produce of the land, letting out small portions at an exorbitant rent to poor people, waiting for the dropping of a life, or the expectation of renewals, forms too generally the description of farmers in this district so highly favoured by situation, soil, and abundance of the richest manure, which nature can bestow.

The following interesting particulars towards a statistical account of the parish of Powerscourt, are too valuable not to deserve a place in this collection of facts, and are in answer to printed queries, which I circulated, furnished me by a gentleman, well acquainted with the parish, and who is most laudably exerting himself to awaken the attention of both proprietors and tenants to their best interests, and the best interests of society, the improved cultivation of the ground, the best application of manures, the introduction of ameliorating intermediate crops, the best artificial grasses, and above all, raising the poor and wretched labourer from a grovelling oppression to a state, in which by his industry he may support with comfort himself and his family,

1. *State of Manufactures?*

“None considerable; some frize is pretty generally manufactured in every farmer’s family for home use,
and

and the surplus disposed of either by private agreement, or by public sale, at fairs; in one or two families, the coarsest kind of felt hats are manufactured for sale, at 3s. or 4s. each; a few women in the parish, when supplied with flax by the gentry, spin it into an inferior kind of yarn, and two or perhaps three weavers can be found, who will work it into sheeting, rubbering, and towels, and at a rate (every expence considered) which in the end exceeds the value, for which articles of the same quality can be procured at a Dublin shop."

2. *Price of Labour and Wages?*

"Labour 10d. per day for men, from Nov. 1st, to May 1st; for the remainder of the year 1s. From 6½d. to 5d. per day, for boys and girls, according to their age and strength. Farmers generally diet their day labourers, and give them 6d. per day in money; seldom employing them for a constancy, but as seed time, and harvest, require their assistance. But although these are the wages, established by the customs of the country, men, who undertake works by task, can earn, at various seasons of the year, from 1s. 6d. to near 3s. per day, according to the nature of the job. Indeed, where work can be done fairly by task, it is ridiculous to employ men by the day; the ablest man, when so employed, will scarcely do six pence worth of work for the employer, but when engaged in a task, will execute five or six times the quantity of work. Every kind of digging, either
in

in drains, ditches, or marle pits, or such like matters, which can be fairly measured, ought to be done by task; but it is a doubt whether mowing, reaping, ploughing, harrowing, or many other operations, which, if done in an expeditious manner, may be done slovenly, ought ever to be contracted for by the task. It is however sometimes the practice for a number of men, to contract for reaping and stacking oats in the field, at 13s. per acre. Meadows are mowed at 5s. per acre, earth is removed at 4d. the cubic yard, ditches are made of various dimensions, at a certain price per running perch. To persons employed in building (short as the days are, at the end of October,) I pay to masons from 3s. 3d. to 2s. 2d. per day, according to their merit, hodmen to attend the masons, 7s. 7d. per week, labourers to hand stones and bricks, 1s. 1d. each, per day, the same prices to be continued as long as the weather will permit building with safety."

3. *Food of the poor and its price?*

"Food chiefly potatoes during eight or nine months of the year. For the remainder oaten meal, and occasionally household wheaten bread. The usual price of potatoes, when purchased, was formerly from 2s. 6d. to 3s. per cwt. in the summer months from June to August. This year 1800 the price has been enormous, and it is hard to say, what have been the chief articles of food, or what their prices. Potatoes in March or April last were scarcely to be procured
for

for 7 or 8s. per cwt. Oatmeal has been so high from May till harvest as from 37s. to 40s. per cwt. In consequence, many articles of food were purchased by the gentry and resold at a considerable loss: besides oatmeal, wheat and barley meal, American Indian meal, and rye meal both very fine were brought down from Dublin, as also rice. And while potatoes could be procured Scotch herrings. All these afforded considerable relief. Nothing, however, on the failure of their usual food pleased the people better than stirabout, made from the flour of Indian meal *ground in America*. At all times, it is to be observed, labourers to gentlemen and considerable farmers, who are not provided with a cow, are supplied by their employers, to the extent of their dairies, with skim milk and buttermilk gratis."

4. Lodging of the poor. Rent of cabin and of ground?

"The labourers sometimes have ground annexed to their houses, from half an acre to five, seldom so much, many have no land with their houses, but rent a little, wherever they can get it sufficiently convenient to their place of residence. When he has the good fortune to hold his cottage and some land immediately from a gentleman or capital farmer, he seldom pays more for it than it is really worth, but when he holds from a petty farmer, he pays from double to treble the real value of the land: instances more than one occur within a quarter of a mile of me, in which a farmer, who represents his whole

farm

farm of 40 acres to be not worth 25s. per acre, lets the worst possible half acre without any house for two guineas a year, and saddles him besides with a very unjust proportion of tithe and county cess."

5. *What manures are used?*

"Dung and the scourings of ditches for potatoe land; afterwards cropped with wheat, oats, or barley, according to the nature of the soil, until the land will produce no more corn; it is then left to the Almighty God to send grass, which in many cases he does in an almost incredible manner. In many instances limestone gravel and marl are used by farmers, who have capital and either of those articles contiguous to them. The former I am not acquainted with; but with respect to marl, petty farmers and labourers, who possess horses and cars, engage to dig and lay out marl on a field adjoining the pit for two pence a cartload, the load supposed 6 cwt. From 800 to 1500 per acre (or at least this has been done his year) are laid out on old worn out pasture land, and it is supposed such a manuring with good marl would afford good crops of corn for 10 or 12, or even 15 years successively. This practice, however, is not at all intended to be recommended, the quantity being too great for the working the land gets. Marl good and stiff, which it is, if good, cannot be possibly incorporated with the soil without frequent ploughings. But it is conceived, that, if marl be contiguous, it would be infinitely



infinitely more prudent to lay on a moderate quantity, perhaps not more than 500 cartloads per acre at first; work that well into the soil, in the course of taking two or three crops, varied as circumstances might require; lay it down then to grass for a few years, and if, in this very grassy country the soil should afterwards require further aid from marl, repeat the operation in even a smaller proportion than above recommended, and by assiduous and frequent ploughing mix most intimately the new as well as the residue of the first marling with the soil; obtain one or two crops from it, and then lay it down to grass, with nearly a certainty of its producing ample crops of grass for hay or pasture, with the occasional assistance of a top dressing of rotten dung or other such manure, as can be had suitable to such a purpose. The interposition of turnips, carrots, and buck wheat, and beans has been tried this year by me *on a very small scale*; the consequence has been, that (such crops not being common in the neighbourhood) much of the produce has been stolen; most of them particularly carrots seemed to answer well."

Proceeding from Powerscourt towards the sea (a distance of between three and four miles) the two rivers of Inniskerry and the Dargle* unite in one stream

* These are the names, by which these rivers are commonly called in the neighbourhood. It is difficult in general to ascertain the names of rivers in this county. They are often named by the townland, through which they pass. The Dargle, I imagine, is a corruption of *dark glen* from the shady vale through which it passes; immediately before its confluence with the Inniskerry after that the united rivers are commonly called the Bray river, although from its principal source arising in Lough Bray one would suppose it ought have had that name through the whole of its course.

stream near the beautiful cottage of the Rev. Mr. Whitelaw. Under this gentleman's direction the Earl of Meath is setting about a variety of admirable improvements, and who as well as Lord Powerscourt is desirous of affording every assistance to add to the improvement and ornament of this highly favoured part of the country. Adjoining to the Dargle, are a great number of beautiful villas inhabited chiefly by men of fortune from Dublin, and who are lavish in expence, in adding to the ornaments nature has afforded. Where these united streams fall into the sea, is situated the village of Bray belonging to Lord Meath and at the entrance into the county of Wicklow from that of Dublin. This village contains two excellent inns and a pretty good market. It is much frequented in the summer season; I am promised a very accurate account of its population and the circumstances of its inhabitants from Mr. Whitelaw, who has benevolently undertaken the improvement of this village, and is endeavouring to ameliorate the circumstances of the poor who are here uncommonly numerous, and who are obliged to pay a most enormous price for their little cabins and lodging.

From Bray two beautiful vales extend on each side of the little sugar loaf mountain. One by Mr. Sandy's beautiful feat, and the other by Kilruddrey the feat of the Earl of Meath. At the Rev. Mr. Sandy's is a fine example of the use and application of limestone gravel, well deserving attention from the agricultural traveller. It consists of a meadow producing most abundant crops of hay, improved from
a barren

a barren stiff clay by limestone gravel. This was laid down by Mr. Blachford, then a pupil with Mr. Sandys, as an experiment in agriculture, ten or twelve years since. The expence was eleven guineas an acre, and has by that means afforded a permanent improvement, by rendering as bad a piece of ground, as could be found in the whole county, equal to some of the best soils in produce any where to be found.

This gentleman, who has been always remarkable for his attention to science, and whose knowledge of mineralogy and chemistry, as well as botany, is inferior to none, formed this experiment by an accurate application of the quantity of manure to the nature of the soil, and found it necessary to make use of a quantity, that was ridiculed by the neighbouring farmers. The event however demonstrates, what is certainly the truth, the great advantage which a gentleman possesses in applying himself to agriculture, who is acquainted with the nature and composition of soils and manures, over the common farmer with all his attention, who is only guided by habit and the customs of his predecessors.

This, however, has not been imitated, and is the only successful instance in the parish, of the application of limestone gravel, which so much, in a variety of places, abounds. I was informed of another, about 50 years ago, by a Mr. Harricks near Inniskerry, who reaped, I was told, repeatedly 18 barrels of barley an acre from the application of this manure.

At the Earl of Meath's at Kilruddery some considerable experiments have lately been made in manuring

nuring with marl, the success of which is not yet ascertained. Towards the glen of the Downs is an excellent farmer Mr. Hicks at Kilnacarrig, highly deserving attention. His farm he holds from Lord Powerscourt, but is one, who with several others ought to be exempt from the general character of unimproving tenants. Mr. Hicks with no advantages, but his own industry and good sense, has brought up in a very reputable manner a numerous family. He does not wait indolently from the apprehension, that his improvements will enhance the price of his farm on a renewal to his family. He spares no labour or expence in manuring and working the land. He does not exhaust it by perpetual crops, but lays it down well to grass after a few crops. He keeps his ground perfectly clean, and is very attentive to keep up a good stock of cultivated grass. He informed me he took much pains to get into a good kind; and by sowing the seeds in clean ground he has kept it up for 16 years, and indeed I saw nowhere better or sweeter hay. He showed me an excellent mode of landing his potatoes, by running the plough lengthways of the drill, instead of crossing the drills; taking first one furrow from the back of the drill, and then returning, he turns over the potatoes clean out of the land which are then taken up by the pickers formed into three divisions of five each, including a man with a pronged fork to turn them completely loose from the soil. The plough then casts off another furrow at the distance of fifteen drills, by which the pickers finish their business without being interrupted by the

the

the return of the plough. By this mode he lands an acre of potatoes with a plough, and a couple of horses, and fifteen pickers in a day. Notwithstanding the general complaints of last season of the failure of potatoes, Mr. Hicks had a produce very little inferior to what he has obtained in usual years, about four score barrels on an acre, which is reckoned a good crop in this part of the country for drilled potatoes; seldom amounting to more than a hundred, or less than 60 barrels. Mr. Hicks has made a fine improvement of a piece of low swampy ground, which had, before he took the farm, been considered as wholly incapable of being reclaimed; it consists of a thin stratum of loose turf on the surface, being peaty earth mixed with sand and gravel. The subsoil a clayey loam, and in some degree approaching to marl. After draining this ground at a considerable expence, he intermixed the surface with the subsoil adding lime, which he makes by burning the alluvial limestone, which he finds in considerable abundance, and of the size of considerable blocks, some containing a cubic foot or more, but all rounded and blunted, containing also cockles in considerable quantities. From the clearing of the drains of this ground, he obtains a great quantity of marly stuff, mixed with peat or turf, which either of itself, or mixed with lime or dung affords a capital dressing for the light soils on his upper ground. In every part of this county there are many situations at present neglected, on which similar improvement, could be made to that of this industrious tenant.

The Glen of the Downs, (so called from its opening into an extensive country abounding with downs, or gently swelling hills,) is a beautiful and romantic opening between the high primitive mountains, which are here covered, on each side, with fine hanging woods, at the foot of which flows a gentle murmuring stream.

On the left is the hill of Latouche, presenting its almost perpendicular side of stupendous height, and covered with wood to the summit, on which is erected, in a most commanding situation, a banquetting house, which produces a fine effect from the vale below.

The whole of this hill, which forms a very extensive inclined surface to the S. E. is most highly improved, both by planting arranged with great judgment and taste, and by the varied lawns, brought to the finest verdure, from being, not many years back, in the wildest state of uncultivated nature, covered with furze, brakes, and rocks.

In viewing the proud domains of modern improvement, while one is led to admire the ornamental operations of art, the pleasure, these are intended to convey, is too frequently checked by the regret occasioned from the consideration of fruitful fields, locked up from producing food for man, and covered only with a herd of unprofitable deer.

Here without any mingled sensation of painful ideas, you can admire the expenditure of wealth, appropriated to the most dignified use. No tricks of a Wyatt, or a Kent, are required in the improvements of
Bell-

Bellview, by ill concealing villages deserted, or cottages overthrown, to make way for the lamentable waste of splendid luxury. Here the barren mountain's side has been forced by its cultivation, to afford subsistence and comfort to thousands, and to present an example to men of rank and fortune, which, if universally followed, would render Ireland the elysium of the world.

The benevolent possessors, do not content their feelings with even amply rewarding the labour of the peasantry they employ. They attend even to the prevention of their wants, and the increase of their comforts. Every article of subsistence is procured for them in this time of uncommon scarcity, and with the greatest attention. A village shop is opened in the demesne under the immediate inspection of Mrs. Latouche, where every article necessary for their families is sold of the best quality, and at a considerable loss. The means of domestic industry are supplied to the females, and the children of both sexes carefully instructed by masters, and mistresses, appointed for that purpose, and the progress of their education constantly examined by their worthy patrons.

What is wanting to render Ireland the happiest country in Europe, but that every village should possess benevolent protectors and patrons to follow so bright an example?

To hold up such circumstances, (alas! too unfrequent) to general imitation seems strictly in conformity to the design of my instructions, and to my duty to the
public,

public, although in performing that task, I would not wish to run the risk of incurring the displeasure of those, whom I would not dare to offend. I have only stated what every affluent family may easily put into practice. But I must forego the pleasure I should have, in describing the attention, assiduity, and perseverance continually exerted to reclaim the idle, encourage the industrious, protect the fatherless, and establish a colony around them, of the happy fruits of their own beneficence. Doubtless they will have their reward.

In the cultivation of this mountain some important lessons are to be found. The elevation I had not instruments or time to ascertain, but it is evidently much greater than on most of the adjacent hills, where cultivation has not reached; but from the admirable fertility here produced, full evidence arises, that such height of elevation, need be no obstacle to improvement. It is very much to the shelter, occasioned by the well arranged plantations of hardy trees, that this fertility is greatly indebted. Nor can there be a doubt that the same shelter could be obtained, on most of the surrounding mountains, in all places not entirely denuded of soil.

The remarkable neatness of the cottages, in the demesne and around it, is also highly deserving of attention. Many of which for every comfort and the utmost cleanliness are equal, if not superior to any, to be seen in the most cultivated spots of the united kingdom. Altogether nothing will afford more delight

to the enthusiast for rural improvement than a visit to Belview*.

From the elevated situation of Belview, a very extensive country presents itself, consisting of gently swelling hills, and concave hollows, many of which are finely improved and planted, with numerous villas interspersed, the whole bounded on the west, and south west, by a vast waving circle of high mountains, and on the east by the sea.

All these swelling hills, and hollows, contain the same alluvial strata, which I have described in the part of the district around Powerscourt, of limestone gravel, pebble limestone, and marl. Those rounded fragments of limestone, are here found at a considerable height up the adjacent mountains. Marl mixed here with coarse siliceous earth, and limestone gravel is found in all these swelling hills. In the hollows, and at some depths in the declivity of the hills, is found both calcareous marle, and the argillaceous. A variety of the calcareous has been lately discovered in two places in this district. Its colour is yellowish white, when dry it has an arid appearance, is earthy and soft to the touch, contains small fibres of vegetables and shells, seemingly those of the small kind of water snails; it is remarkable, as in it are found the fossils of the mouse deer, now only found in America. The fossil horns and head, with many other

* An account of the conservatory, which is inferior to none. And of the botanic garden, in which is a collection of all the indigenous plants, and grasses, I hope still to find a place for, in the sequel of this work. But I am afraid I shall be thought already encroaching too much on the plan laid down for me.

other parts found in a pit belonging to Mr. Archer, near Innislymonde, are preserved at Lord Rossmore's. In the only other pit, I have seen in this part of the country, which is at Mr. Brownrigg's, I found several pieces of the fossils of the same animal. In the same species of marle in Germany are frequently found fossils of Elephants, Rhinoceros, Turtle and other India animals.

From the abundance of these substances of limestone gravel, and marle, an easy opportunity of improving this country is afforded to the inhabitants, who of late years, have begun to make much use of these manures, but; I am informed that about 50 years ago, those inestimable gifts of nature remained totally neglected and unknown. It is much within that period, that any considerable use has been made of those manures, nor is the use, and proper application by any means general nor well understood.

About three miles from Belview, is Mount Kennedy, the seat of Lord Rossmore. About thirty-five years ago, this Nobleman, then General Cunningham, retiring into the country, after the peace, purchased a few acres of land, which he has gradually increased to a vast extent, almost the whole side of the country, in which he has made most extensive and beautiful improvements by the application of limestone gravel, and marle. With great taste, and wonderful perseverance, he has covered the surface of those beautifully swelling hills, and concave hollows, with the finest verdure, and by draining, and manuring, and labour alone, he has expended upwards of £64,000, to the highest ornament and improvement

provement of the country. He was formerly extensive in tillage, but keeps up now the improvement of the surface by sheep, after having laid down to grass after a very few crops, so as not to allow the ground to be worn out by corn crops. His grounds, however, have in many situations, become much addicted to moss, probably, from not marling sufficiently at first, which on account of the trouble, and expence, is seldom done by those, who proceed on improvement, more ornament, than profit. At some distance from Mount Kennedy, toward the sea, there is an extensive stratum of stiff clay soil, abounding with marle, at no very great depth from the surface. This the farmers apply to the improvement of the soil, with great industry, and produce by this means a fertility, which seems to be inexhaustible under any proper management.

It is not unusual to put on marle, to the amount of 1500 to 2000 loads, of six cwt. each car load. The practice is to put the marle on lay worn out ground, in the month of June or July, and to let it remain until September, the following year. It is generally, when put out on the land, in large pieces, which gradually fall to powder, by being exposed to the winter rains and summer sun; and it is considered to improve the soil still more, if allowed to remain on the surface for two or three years. After this coating with marle, they will take sixteen or eighteen crops of corn following, without interposing any thing but grain crops. Wheat is often the first crop, afterwards barley, with now and then the interposition of a crop of oats.

There

There are many instances of farmers acquiring a very independent property, from persevering industry, in following this system. Mr. Robert Darlington, who accompanied me through a considerable part of this district, gave me a most interesting account of the successful progress of persevering industry, exemplified in his own endeavours, by application to improving a very small farm by marle, on which from an early age, he not only supported his mother and sisters, but paid off some small incumbrances, and has by continuing to extend his efforts, arrived at ease and independence. And I found that, with every justice, this respectable man was highly esteemed in the country, and the general arbitrator of all the little disputes and differences that arose. Mr. Darlington introduced me two brothers, of the name of Hanlin, whom I found engaged in laying out marle, on a field adjoining to the pit. This pit, or rather bank, was on the side of one of these gently swelling hills I have described; the highest part from the carway into the marle pit, is about 40 feet. A great part of it consisted of siliceous earth, chiefly on the upper part of the bank, but on the lower part was a compact marle, of a lead grey colour, and in some places a chocolate brown. They told me, that advised by Mr. Darlington, they had taken some farms and borrowed money through his means for their improvement; by persevering in his mode of culture by the use of marle, they had paid off all the money they borrowed, and had now a clear estate for ever, of from five to six hundred pounds a-year.

In a field near this, Mr. D. shewed me a crop of barley, the thirteenth, after manuring from the same pit, which appeared to be a pretty good one, but fuller of weeds than any I have seen. These examples are by no means, however, generally followed. A great extent of ground is to be seen, capable of being highly improved by the same industry, which is only employed in feeding sheep and cattle, upon the natural grasses of the soil.

But altho' these farmers have considerable merit, their subsequent conduct deserves the highest censure, by thus taking such repeated crops of grain, whereas by a fair rotation and interposition of clover, and other artificial grasses, they might continue these lands in the most exuberant fertility. In this part of the district the Rev. Mr. Brownrigg is distinguished for a superior stile of cultivation. His mode, which is beginning to be much followed, is to rest the land by a drill crop of potatoes, after taking three or four crops of grain. He puts on the potatoes in the drills, a cart-load to every square perch, not so much to benefit the ground, as to nourish the potatoes, until they appear above the surface. He horse-hoes them repeatedly, with a double mold board plough, generally three hoeings; the drills two feet asunder. He plants from eight to ten barrels an acre of potatoes, and in general expects from 100 to 120 barrels; last year, they were much under that produce. By this fallow crop having cleared the ground, he takes a crop of barley with clover and trefoil, and keeping it in lay for two or three years, he takes a crop of wheat
and

and then barley, without any other manure. Produce, sixteen barrels of barley, and ten barrels of wheat, which, to the English acre and English measure, is five quarters of barley, and three quarters one bushel of wheat. This is the common produce of the marled ground.

Mr. Archer, of Mount-John, has made extensive improvements, also in a very superior stile. His farm of Innis-Tymonde, is an excellent example of what can be done in this country by clearing and manuring. This farm is on argillite substratum, not on the limestone gravel. It is well divided, and inclosed, about ninety acres, to highly improved from worn out ground, and a great part unreclaimed. The situation is beautiful, and in the neighbourhood of Lord Rosmore's fine improvements of Dunran mountains. Mr. Archer has been long a very extensive improver. His public duties as High Sheriff of the county, ever since 1798, and commanding a corps of yeomanry, prevented my having that information from him, of which he is so highly capable of affording. He averages the whole produce of the county at, to the Irish acre,

- 8 barrels of wheat,
- 13 ——— of oats,
- 12 ——— of barley.

To the English acre and English measure it would give

Wheat,	2 quarters	4 bushels	0 pecks
Oats,	4 ———	0 ———	4 ———
Barley,	3 ———	6 ———	0 ———

This average, as far as I could enquire, is a very fair average in this county*, which from the varied soil and surface, may be almost an average for the whole kingdom.

In the upland and mountain land, lime is the manure made use of. Formerly it was the practice in the mountain ground to take rye after bauning, but now in general, they take oats after a poor liming. Of this mountain ground, there is a great extent capable of very beneficial improvement.

In the upland ground, lime has a wonderful effect in promoting fertility, but it is very expensive, as no limestone rocks have yet been discovered, notwithstanding the abundance of those fragments every where found in the gravel pits, and in the rivulets and ravines under the mountains in this district. As the detached stones, in every circumstance, are pretty certain indications of what species the solid and regular strata consist; and although by certain revolutions, some of the beds or layers of these rocks may be shattered

* Comparing this with the average in Mr. Middleton's survey of Middlesex, it appears, the produce of this country averages, one bushel, two pecks an acre, above the produce in England, by the English acre. *Mid. Sur.* 481.

shattered and broken, and washed from their original situations for many miles, yet instances seldom occur where large quantities of detached stones can be found; but some part of the solid rock, to which they belonged, is to be found, is covered some where in the adjacent grounds; it seemed to be an object of the first importance to the improvement of agriculture, to try on what probability the opinion of the limestone rock, from which these fragments had been detached, being to be found in this county was founded. I therefore made it my object to examine with great attention the various beds of the rivers and ravines, which are to be found, proceeding from the mountains, through the various strata towards the sea. In all cases, both in the Powerscourt district, and towards Dunran mountain, Drumbawn, and Balnahinch, and further at Glynmouth, and towards Carricmarely, I found that, as you proceeded upwards to the primitive mountains, the limestone pebbles disappeared, both in the beds and banks of the rivers, and in the pits made in the land, although in some instances, they were found at considerable heights; nor although in the situations where the appearances of these fragments; ended, I arrived at the primitive rocks, on which the horizontal beds of limestone are always found incumbent, did there appear any such rocks or beds of limestone. From this circumstance, and not finding in any of the rivulets higher up, in the internal parts of the mountains, any fragments of limestone, I was naturally led to conclude it would be vain to look for those rocks, from which the fragments

ments had been detached amongst the still higher mountains, in the centre of the county. But as the detached limestones are found in great abundance through the whole district, between those primitive rocks and the sea, it must be concluded, that if the solid regular limestone rocks, from which these stones had been broken, were to be discovered, it was most likely that they would be found somewhere between the highest part of the country, where they appeared in the ravines, and the gravel or marle pits, and the sea.

I therefore, after tracing the river Bray to the sea, in which I found a rock of sandstone, of evidently modern formation, examined with much minuteness, the extensive district of the barony of Newcastle, where a long line of low, and flat sea coast, presents itself. At the northern part of this coast, near Bray Head, a rivulet runs through a beautiful vale, from Mount Temple, emptying itself, into the sea, at the Grey-stones, where I found a rock of compact argillite stretching out into the sea, and forming a fine natural harbour, with an excellent roadsteads adjacent for ships of any burthen, from fishing vessels, to the largest frequenting those seas, and which at a very moderate expence, in forming the rock into a quay, and deepening inwards, could be made of great importance, to the numerous fishing vessels, on this coast, and to the whole Channel trade.

On this rock I found incumbent, a bed of indurated marle, in which there is abundance of fragments of limestone, some of considerable size.

On making an analysis of this marle, I found it to produce the following result,

Marle,	
Black, indurated,	
Fracture earthy,	
In a hundred parts, I found it to contain,	
Mild Calx	29
Silex	19
Argill	52
	<hr/>
	100

Notwithstanding the good quality of this marle, the tenant, who accompanied me with Mr. George Latouche, assured us that it had never been discovered that this substance was marle, and it never had been used as such, by him, or any other person, he had heard of. This is no doubt owing to its being a little different in appearance, from the marle, which the farmers are in general accustomed, to make use of, and is one striking instance amongst many proofs I have had of the treasures of this nature which by proper investigation might be found for enriching the soil of this country.

Adjacent to this harbour, is a plain, which might be formed into a convenient village, into which the fishermen scattered on the coast, might be with great advantage collected, and under a benevolent land owner, freed from the heavy oppressions, to which we found them subjected, in being forced to pay for their cabbins and a patch of land, a most exorbitant rent, amounting to the rate of four and five guineas an acre. And by having some improvement made of this harbour, they would not be exposed to the losses,

losses, to which they are so frequently subjected, by having their boats beat to pieces, by the surf, on the beach, which also prevents their pursuing their industry, but is the occasion of numbers annually perishing, in returning from the fishing ground.

From this harbour, to the harbour at the town of Wicklow, a stretch of ten miles, along the sea coast, is a low flat beach of gravel, and sand, without any primitive, or other rock, making the least appearance even at low water. On this beach, the sea has gained considerably, in the memory of the people, living in the neighbourhood, and at one place called, the breaches, is a considerable marsh, formed of near half a mile in breadth, from the overflowing of the sea; and further to the south, this kind of wet and marshy ground, is extended, almost the whole way to the town of Wicklow, without the indication of any thing, like the horizontal beds of limestone, of which we were in search.

From the centre of this ground, you have an extensive view of the whole adjacent country, forming a bold semi-circle, of which the shore may be considered as the diameter, or string of the bow, and the circle formed by Bray Head, the little Sugar loaf, Latouche's Hill, Drumbawn, Balnahench, and Dunran, narrowing towards Wicklow, until the primitive rocks reach down to the sea coast; and the black castle, overtopped by Wicklow Head, finishes the line.

In all this district, the rounded and blunted fragments of stones, of the same nature as those of the primitive rocks, which are found in the ravines, and gravel pits, and on the sea shore, washed out of the
land

land, are easily accounted for; but the limestone pebbles, containing shells, and other extraneous substances, in their composition, being found, not only in the low swelling hills and hollows, but at such high elevations, requires a more minute investigation, especially as limestone is now universally acknowledged to be of modern formation and incumbent on the primitive strata.

The nearest modern horizontal limestone rocks, which I have seen, are in the bed of the Dodder, above Donybrook, in the lands in the neighbourhood of which, I have been informed, there are to be found, fragments of limestone; in the bank on the sea shore, at Booterstown, I found very large, and blunted fragments in marble, of several cubic feet in magnitude. There is also limestone rock, at the promontory of Howth. It seems of a different composition, from the pebble limestone; the pieces of the Howth limestone, I have seen at the lime-burners, being of a yellowish grey, and the pebble limestone of a bluish grey. I am informed also by those, who have tried both, that the Howth limestone is not equal to the pebble limestone, either for agriculture or building. But there does not seem any probability, that from any volcanic explosion, or any other revolution, the limestone found in this district, at so great a distance, from either of these beds or rocks of limestone, could have been separated from either of these beds, and washed into those places where they are found, throughout the district. It appears a more probable conjecture, that there were originally horizontal beds of limestone, formed in the vicinity of those places, where now these
detached

detached stones are found, and that some of those beds might extend a considerable height up towards the mountains, incumbent on the primitive rock, as their base, and that these had been broken and partly dissolved in water, which on its recess had produced all the deposition, and other phenomena we have described.

SECT. II. *Western alluvial District.*

ON the west of the central mass of primitive mountains, is found also a very extensive district under the mountains, abounding with similar strata to those, which we have described, consisting of limestone gravel, marle, and pebble limestone, extending throughout the whole space of country, from the borders of the primitive mountains to the confines of the county, where it is joined by the counties of Dublin, Kildare, and Carlow. These strata are found also extending themselves into the adjoining counties we have named, to a considerable distance, the breadth of which, or whether these continue to the beds of horizontal limestone, near Carlow, we did not ascertain. I found however, that to the south, for a considerable extent on each side of the Slaney, they did extend to a considerable distance through the county of Carlow into the county of Wexford. The nearest horizontal beds of limestone, that I have seen to these layers or beds of pebble limestone, are within about two or three miles
of

of Carlow. In the counties of Kildare, the Queen's county, and Kilkenny, I am informed there is abundance of horizontal limestone, and there seems little doubt, but that these horizontal beds of limestone had been continued formerly to the primitive mountains, but that they were broken and dissolved in the disorganization of matter occasioned by the same causes, as have produced the similar phenomena we have described on the eastern side of those mountains.

The strata of pebble limestone I traced from near Humewood on the south, to Blessington on the north, a stretch of about fourteen miles, extending throughout the two half baronies of Talbotstown, including the extensive Glen of Imale. In the whole of this district the limestone gravel appeared very abundant. There are some hills of considerable magnitude near Baltinglass, but the rest of the district consists of low hills, long and flat, with hollows intervening, and these sometimes extended into meadows of some extent and great fertility. In all these hollows, marl is found, and in the low hills, abundance of limestone gravel, and pebble limestone. Shell marl, containing the fossils of the mouse deer, has also been discovered some years back. Branches of the horns of this animal, and the head, are to be seen at Mr. Saunders's, of Saunders Grove near Baltinglass, found in a fossil state in these marl pits.

In this extensive tract of land, in which are to be found these alluvial strata of pebble limestone, and marl, there is on the borders of the county of Wicklow, adjoining to the county of Dublin, a very considerable

siderable extent of these low hills covered with heath, and dwarf furze, the soil wet and boggy, producing very poor herbage in summer, and in winter wholly unfit for any thing. On this land at the depth of 5, 6, or 7 inches from the surface, sometimes a foot, but most commonly at 5 inches, is found an extremely hard stratum, through which it is very difficult to break; it cannot be ploughed, or dug with a spade, which I tried in various places. It requires the use of a pick-ax, with considerable labour, to pierce or break through this stratum, which is here called the curb or the griddle. This stratum is wholly impervious to water, which stagnating on the surface, renders the whole a mire or bog.

Universally I am informed, and in a variety of instances I found, immediately underneath this curb or griddle, which is from 4 to 6 inches thick, a yellow argillaceous earth mixed with coarse gravel and small stones, and at the depth of a few feet, limestone gravel and loose marle. By breaking through this curb or griddle it is found, that in a short space, the whole adjacent surface is drained of its water, and the stratum itself, which forms the griddle, becoming dry, is rendered capable of being turned up by the plough. This effect is much facilitated and hastened by opening pits in various parts, and covering the surface with the limestone gravel and marle, dug from thence, which by repeated ploughing being well intermixed with the soil, produce a most permanent improvement, and being sown with grass seeds either with or without a crop of rye, afford excellent meadow and pasture. So that I have seen of this
ground

ground on one side of a hedge, the land not worth sixpence an acre, and on the other side, improved in this way, feeding bullocks worth twenty guineas a piece.

Of this land, at present in the state of unimproved wastes, and capable of all being equally improved with that which I have mentioned, there is a vast extent on the tract of country around Dunlavan, and extending to the Tallagh hills in the county of Dublin, amounting, by estimation, to between 8 and 10,000 acres.

On a part of this tract of moory land consisting of 30 acres, taken in from the waste in 1799, and covered with limestone gravel, I saw a very fine crop of potatoes, about 8 or 9 acres, without any other manure than the limestone gravel. The potatoes were not dug out, when I viewed the field, but by taking up a number of the roots in various parts of the field, the crop appeared to me much more luxuriant, than the greatest part of the crops I had examined.

Here then, in presenting to the Society the consideration of these extensive wastes, is an important object of public improvement to be brought into effect. And this, not farther distant from the Metropolis than twenty miles, and a great part even in the county of Dublin.

An intelligent farmer who has reclaimed some hundred acres of this land, favoured me with the following account of the expence of doing so, at the rate of 1500 car loads per acre.

Providing the limestone gravel is put out from one pit, in the centre or any part convenient of a ten acre field.

A horse will put out 30 loads per day. It will require 10 men to dig out, load, and put out on the land the gravel to six horses, which at 2s. 2d. for each horse, 1s. per day for each man, will amount for 1500 loads the quantity to one acre, to

9 7 8

A ten acre field will take 340 perch of fence to inclose it, which without quicks may be executed at 2s. 6d. per perch, or £.42 10s., and per acre

4 5 0

The limestone gravel is generally put out in June and July on the surface, where it is allowed to remain the following winter. In spring, potatoes are planted in the limestone gravel and marl, in the lazy bed manner, the trench being dug through what is called the curb or griddle. After the potatoes are taken up, the ground is worked with a strong plough and four bullocks, which estimating the expence of the ploughman and driver at 2s. per day, and keeping up the bullocks at 10s. it is estimated, that the ploughing will occasion an additional expence of 30 guineas, or 3 guineas per acre

3 8 3

£.17 0 11

His practice is then to sow grafs seeds with rye, or without, which last he considers preferable, and supposes the land will not bear grain crops. He values the produce of the potatoes to pay for the odd £.7 os. 11d. with the expences of extradigging, rent, grafs-seeds, &c. and that the sum of £.10 an acre remains to be paid for, by the future produce of the field, which is then so improved as to be let for 20s. an acre.

In this account it appears that, although the expence of cultivation may not be over-rated, yet the profit on the potatoe crop is much undervalued, especially at the present price at which potatoes are sold. For the expence, as above, of a field of ten acres, at £.17 os. 11d. per acre

£.170 9 2

Produce of potatoes at 60 barrels per acre, after returning the seed, at the old price of 5s. per barrel, would be

150 0 0

Balance against the expence as above }
amounting to little more than £.2 an acre. } £.20 9 2

At the price this year of potatoes, taking it only at 10s. the barrel, it would pay for nearly double the expence of the field; or that 15 acres of potatoes would have paid for the reclaiming and inclosing the whole 30 acres, on which the limestone gravel was put out; so that in the course of *two years* you would have the money returned, and an improved value of 20s. per acre added to the soil, which by being fed with cattle and sheep must always be going on improving.

It may be therefore a consideration with the Society to enquire farther into this subject, and by some premiums properly adapted to the circumstances, induce people to expend large sums on the immediate cultivation of these lands.

A farmer told me that, if a premium of £.5 an acre were offered, he would engage to cultivate 50 acres of this land, and plant them with potatoes on the limestone gravel and marl, and that he would bring of that produce into the public market of Dublin, at the rate of 65 barrels of potatoes an acre; and there sell them at the ancient price of 5s. per barrel. If ten people only were to do the same, or in other words, if 500 of those acres were cultivated in this manner annually; what a vast relief would it afford at a comparatively trivial expence to the country! and of how much more importance would such an expenditure be, than the numberless modes in which such a small sum as £.5,000 is expended, and which would not amount to more than one shilling and sixpence halfpenny premium, on each barrel brought into Dublin market. How readily would the opportunity be seized this year by individuals alone; if at that rate or double the sum, potatoes could be imported for the poor to the amount of 40,000 barrels, which *might have been or may in a future year be produced* here in the neighbourhood of the metropolis.

It may be said, that the advantages of reclaiming these lands in the view of profit, appear so considerable, that a premium would be superfluous; but when the want of capital, is taken into account, it will
be

be found, that there are not many in this part of the country, who are able or willing to expend to the amount of £.10 an acre, upon manuring the land, even with the expectation of a speedy return. Indeed I know of no subject so highly deserving the attention of the respectable Dublin Society, as the consideration of suggesting to the Legislature the means of an immediate and direct encouragement to promote the cultivation of barren wastes, in this part of the united kingdom.

The Dublin Society have already in a variety of instances, greatly promoted the improvement of agriculture, and this year have offered premiums for the culture of potatoes. It would be great presumption in an individual, to suppose he is capable of advising this justly celebrated body with regard to the mode, in which they might best proceed, in a still *more spirited manner* in promoting the improvement of agriculture. But I hope it will not be considered as presuming too much, in saying that from my own enquiries, and the conversation I have held with the most intelligent farmers, I am very much inclined to be of opinion, that no sum of money could be better disposed, than in direct premiums for the cultivation of barren lands under proper regulations, course of crops, &c. and that nothing deserves so much the serious and attentive consideration of the Legislature, in order to accelerate agricultural improvement. And there is every reason to believe, that had the sums of money applied to other purposes been applied directly to this object, as suggested by Mr. Young upwards of 25 years ago, agriculture would
 have

have been advanced in this Island, in an incomparably greater degree than it at present is advanced.

Although I have said so much on the subject of those neglected lands, it is not to lands wholly uncultivated that this inattention and neglect is attached. The Glen, or certainly more properly the vale of Imale, is a beautiful tract of country in the midst of very high mountains, between five and six miles in length, and three to four miles broad. The greatest part of it low and flat land with fine gentle swelling hills, or rather lawns. It stretches from Stratford upon Slaney to the bottom of Lugnaguilla mountain, containing not much less than 10,000 acres of rich land, with abundance of marl and limestone gravel in all parts of it. The finest situations for planting all kinds of trees, with the utmost certainty of their growth, abundant streams, fuel in great plenty, in short every thing to render it a populous, fertile, and beautiful country. Whereas, it is scarcely any thing but a naked desolate wild, with a few patches of oats in different parts, and on the sides of the mountains. Much of this is no doubt to be ascribed to the late much to be lamented disturbances of this country. But the general appearance of this fine vale, the total want of regular inclosures, even the want of the remains of buildings, except some long in ruins, the want of trees and plantations, evince that the neglect of the natural advantages of this country must be traced to far more distant times, than the beginning of the late disasters. And I am afraid it will require more attention from the proprietors to recover it from this state, than the restoration alone of tranquillity
is

is likely to induce them to afford. And I fear also that on men so supinely negligent of their own interests, and regardless of the improvement of a tract of country containing so many capabilities, premiums, honor, reproof, would equally have little effect.

At the bottom of this vale, finely situated on an eminence in the banks of the Slaney, is the town of Stratford, where Mr. Orr has established a very extensive manufactory for printing cottons, on which he has expended upwards of £.30,000, and employs a great many hands, all of which, weavers, printers, and various artists, are natives of the country, in number altogether between four and five hundred. And is one amongst the numberless proofs every where exhibited, that the natives of this country, as they are inferior to no other people for acuteness and ingenuity, so neither are they, when properly encouraged, inferior to any for diligence and attention.

Mr. Orr, in reclaiming the heathy mountains, over the seat of this manufactory, has shown a spirited example of agricultural improvement. This land, part of a farm annexed to the town, was covered with heath, and considered in the neighbourhood as incapable of cultivation. By inclosing, manuring partly with marle, brought at a great expence, and partly by the dung of the village, and the scourings of the roads, he has rendered it equal to most in produce. I saw some fields of barley near the summit of the hill, and some oats, that by the number of shocks, in which the grain then reaped was piled, appeared to me superior to what I had seen in any of the low-lands in the neighbourhood. The barley and oats were both

estimated

estimated at nearly fourteen barrels an acre. I was shown also, on this high situation, a crop of rape, that was valued at £. 21 an acre. Some of the highest fields, he had covered with limestone gravel, at the expense of near £. 22 an acre. This he intends as an experiment, to try its effect in that high situation, and dry soil. Limestone gravel is known to have the effect of destroying heath. This it had already done in a few months to a remarkable degree. His intention was to plough it for oats this spring, and afterwards take a crop of rape, and lay down to grass and clover, with oats or barley. The effect of his example is conspicuous in the neighbourhood, by the improvements beginning by tenants of the high grounds on the adjacent hill, which before they saw the crops reaped by Mr. Orr, on ground of the same nature, they considered incapable of making any adequate return, for the expense of cultivation.

This is also a proof of the aptitude, which the people of this country have, to follow examples in agricultural improvements. And it is a very pointed reprehension on the proprietors of the country, that they should be indebted to this establishment, for an example, in which it is their own interest they should take the lead. And it is still more to be regretted, that the industrious person, who has afforded this example, has been hitherto prevented from extending his farm, by the demand of a most exorbitant rent, for the land now a barren heath, adjoining to what he now holds; a rent not calculated on the actual value of the ground, but in a supposed proportion to the value, to which he could raise it, by his own expense and labour.

Another

Another remark, which naturally arises in the consideration of the establishment of this manufactory, is the *superior importance of a plentiful stream of water*, to any other advantages, for such an establishment. Stratford upon Slaney is twenty-six miles distant from Dublin, which is the market for the goods there manufactured, and to which they are sent by land carriage. Stone coal can be had no nearer than Carlow, which is 12 miles distant by land carriage, all other coals they get from Dublin; nor is turf very convenient or abundant. *A most abundant stream of water*, equal to any machinery they can possibly want, and adequate to all purposes of washing, bleaching, and other operations, *compensates for all other disadvantages* of the situation.

In Scotland, Glasgow, which has long rivalled Manchester, in the cotton and muslin manufactory, is situated in a coal country. But the abundant streams of water found in the eastern part of Scotland, and particularly in the mountainous district of Perthshire, have, for these fifteen* years past, occasioned a vast extension

* It was about that period that Mr. Arkwright erected at Stanley, on the river Tay, the first cotton mill in the east of Scotland. On viewing the command of water at this place, "If I could bring this to Manchester I would give you £.30,000 a year for the use of it," was Arkwright's expression to the proprietor, the Duke of Athol. Let us then, said the Duke, bring Manchester to Stanley? Every requisition of Mr. Arkwright and the company he formed, was most cheerfully complied with. The Duke himself superintended the building. For expedition he brought a whole corps of masons and bricklayers from London. An immense pile of building was finished as if by enchantment, and a town founded, which suddenly amounted to 4,000 inhabitants. The example was followed, and upwards of £.200,000 capital was employed in that manufacture in the same neighbourhood, in the course of not more than five or six years.

extension of the cotton manufactory to that part of the country, to which coals are brought, by a considerable length of sea and river navigations, and afterwards by eight and ten miles' land carriage. The vast number of plentiful streams in the county of Wicklow, flowing on all sides from the mountains, afford admirable situations for machinery, both in the cotton and woollen manufacture; in most of these situations also, abundance of turf for fuel, which for the heating of stoves, boilers, and most other purposes, when immediately at hand, forms a good substitute for coal, and by being carefully charred, is rendered almost equally lasting.

From these circumstances, by spirited and liberal encouragement from proprietors of this county, there can be no doubt, that people of capital will speedily engage in extending to this county various branches of these useful manufactures, to the great advancement of the landed interest, and the employment of the people.

In this view of the western district, although we have considered it our duty, to present those strong features of neglect of cultivation, it would be great injustice not to add, that around Baltinglass, and on the tract of country towards Blessington, there are in these two half baronies of Talbotstown, a great number of resident (at least resident before the rebellion,) gentlemen of independent but moderate fortunes, who have been accustomed to live very much on their estates, and in great harmony with each other.

From the destruction which took place in this part of the country, many have not yet rebuilt their houses, or returned to the country. But to judge by those I had the pleasure of meeting, and by the improvements around their places of residence, great exertions appear to have been made for some years back in planting, inclosing, and otherwise improving different parts of the country. In the neighbourhood of Stratford, Morley Saunders, Esq. of Saunder's Grove, not only distinguishes himself by particular attention, and protection to the manufacturers at Stratford, but exerts himself in every respect, in encouraging agriculture and industry, in the country adjacent. This gentleman is also laying out an experimental farm, for the instruction of his tenants, and the surrounding farmers. I was present also at his laying the foundation (jointly with Mr. Greene, a proprietor in the same neighbourhood,) of a draw kiln, on an improved construction, for burning the pebble limestone, and furnishing it to their tenants at a very reduced price. An example well deserving of being universally followed. Mr. Saunders also gives ample encouragement to his tenants to inclose and plant, for which purpose he furnishes them gratis with quicks and several kinds of trees.

Mr. Greene, on his estate at Kilranelagh, has undertaken an operation of much difficulty, but highly laudable and deserving imitation, by every proprietor, who looks forward to the amelioration of his property, in the inducing improvements in husbandry, and the habits of industry. In the greatest part of this county, and indeed, in most parts of Ireland, the

custom of holding lands in partnership still prevails, originating and continued by the want of capital, and wretched poverty of the farmer. The lands held in this manner he has divided, building comfortable dwellings, and convenient offices on each; he is at the expense of inclosing each farm with good substantial ditches and hedge-rows. He furnishes them at the kiln, with lime for 1*s.* 1*d.* per barrel, which, ten miles farther off at Carlow, would cost 2*s.* 8*d.* For every barrel of lime they purchase to lay on their lands, he adds gratis an equal quantity. In return for this, they are to allow him to direct them in a course of crops, with intermediate crops of clover, of which he furnishes the seed, and they are to allow him the privilege of acting as their steward, in the management of their farms. Many will hold this conduct in contempt, and few will take the trouble to follow the example. Mr. Greene, notwithstanding, will improve his estate, better his rents, and make his tenants industrious and happy. Mr. Greene has planted very extensively, on a mountain near his house, where the trees are thriving well.

At Humewood is an extensive belt of planting, of eighty-two Irish acres, and which are increasing rapidly. The land in general at this place is very excellent. The grounds well laid out, and well inclosed, but Mr. Hume's constant duties, as a foldier and a magistrate, prevent him from adding to the attractions of his hospitable mansion, any new or extensive improvements in agriculture.

From the Rev. Mr. Mac Niel, Rector of Hacketstown, I am favoured with the following answers to my queries. In which parish is also included this, in
which

which Humewood is situated, and a third parish in the mountains, by the names of Haraldstown and Kiltegan. The union being by about twelve miles by eight in extent, according to estimation, 40,000 acres.

Schools ?

Two. Sixty male scholars ; forty females. These two schools are in the village of Hacketstown. There are two or three others in the remote parts of the parish ; the state of which I am not acquainted with, as it was highly dangerous to go out to the country parts until very lately.

State of Manufactures ?

There are not any manufactures, except those of flannel and frize, which are carried on by farmers at their respective cabins or houses, or their farms.

State of Mines ?

No mines have yet been discovered.

Price of Labour and of Wages ?

Labouring men receive per day, one shilling British without food. Men servants to farmers, about four guineas.

Food of the Poor, and its Price?

Potatoes, at five-pence and six-pence per stone.

Clothing of the Poor, and Price?

Frize, coarse cloth. Frize at 3*s.* 6*d.* per yard; the cloth of sundry prices, from six to eight shillings, forest cloth.

Fuel of the Poor, and Price?

Turf in great abundance, at sixpence-halfpenny and eight-pence, per creel.

Lodging of Poor—Rent of Cabins and of Ground?

Cabins, with a garden, at two, three, or four guineas, *ad valorem*. Ground from four pounds to ten shillings, per acre.

Tools, Implements of Husbandry, and Price?

Spades, three shillings; shovels, four shillings; ploughs, from thirty-five to forty shillings. Harrows, the same price; cars, about one guinea and a half.

Price of Cattle.—State of Markets and Fairs?

Dry cows, from five to nine guineas, *ad valorem*. Milch cows, from seven to twelve guineas. Bullocks, from five to fifteen, or more, guineas. There are eight annual fairs, well attended by the country. Cattle the principal article of trade.

STATE OF CULTIVATION, 1800.

		ACRES.	
{	<i>Arable.</i>	Wheat, - - - - -	very little,
	Oats, - - - - -	some thousands,	
	Barley, - - - - -	some hundreds,	
	Rye, - - - - -	not much,	
	Bere, - - - - -	none,	
	Potatoes, - - - - -	500,	
	Rape, - - - - -	none,	
	Peas, - - - - -	none,	
	Vetches, - - - - -	none,	
	Turnips, - - - - -	none,	
	Flax, - - - - -	about twenty,	
	Other Crops, - - - - -	none,	
Fallow, - - - - -	none,		

Meadow.

Natural, - - - - -	600
Water, - - - - -	300

Artificial Grasses.

Clover, - - - - -	}	None sown alone, but mixed.
Trefoil, - - - - -		
Rye-grass, - - - - -		
Other grasses, - - - - -	2000	

Pasture.

Bog, - - - - -	many thousands,
Waste, - - - - -	10,000,
	2,000.

What Manures are used?

Lime and dung, in some places limestone gravel.

Expense of Manures?

Lime, four shillings and nine-pence per barrel; dung, three and four-pence per car load.

How much land in common or uninclosed?

In the mountains very large tracts, which it would not be possible to ascertain without an actual survey.

Nature of Tenures.—Quantity of absentee property?

The part of the manor of Clonmore, which lies within this parish, is for the most part, let in perpetuities. Earl Fitzwilliam is proprietor of several extensive town-lands, let for twenty-one years, or one life. The estates of Captain Hume, and Mr. Westby, are let for the most part for three lives.

Defects in practice.—Obstacles to improvement? And what remedies are possible?

The defects in practice are, that winter and spring crops, such as turnips, cabbages, borecole, are not at all cultivated; otherwise the farmers cannot be called unskilful.

The

The greatest obstacle to improvement, is the want of water carriage for lime from Carlow. The distance by the high road to Hacketstown is, from Carlow fourteen miles. But if a canal were cut from Carlow to Hacketstown, by Tullow, and continued, or into the heart of Lord Fitzwilliam's estate, to Aghrim, the advantagss would be incalculable.



TO give an account of the improvements in planting, inclosing, &c. carrying on by Mr. Owen Saunders, in the neighbourhood of Humewood, and by many others near Baltinglafs, would much exceed the limits of this General View. In the upper half barony of Talbotstown, is the seat of the Earl of Miltown, in which neighbourhood there is much excellent land, on the banks of King's river and the Liffey, a very beautiful country. Near this is some very ornamental planting, of the Marquis of Waterford, and the site of his elegant lodge, burnt by Holt's banditti, who infested for a considerable time, the adjoining mountains. Almost every house in this neighbourhood has been destroyed except Rufsborough, which is formed into a garrison. Captain Hornige, opposite to Rufsborough, has a very improved farm, and is beginning to rebuild, and carry on his improvements. In all this neighbourhood cultivation appears to have been fast advancing towards the mountains; in some of which, particularly Baltiboys, the limestone gravel is found at a considerable height up the elevated sides.

SECT: 3. *Central or Granite District.*

THIS district, which comprehends a great part of the lower and almost the whole upper barony of Talbotstown, with the whole of Balinacor, and is more than 100,000 Irish acres in extent, has been in consequence of the rebellion, wholly laid waste, and until late in last summer, that the troops had taken full possession of it, it was not safe to explore it. Towards the autumn, I went over a great part of this extensive tract. But without a very minute examination it is not possible to give any specific description of the quantity of land fit for improvement in this tract, nor of the best means of turning it to advantage. The introduction of a proper breed of sheep would, no doubt, be the most effectual mode of improving it. Of all others, it appears to me, the Cheviot breed of sheep is the best adapted for this purpose. On this subject, I have been honoured with a letter from Sir John Sinclair, who, with that readiness, with which he attends to every thing for the improvement of the kingdom, favoured me with directions how to procure this breed, in the best manner for any gentlemen, who might be desirous of obtaining them; with an extract from which I shall beg to conclude all I shall at present say of this district.

“ I am

“ I AM so much occupied with public business
 “ at present, that I have little time to do
 “ more than acknowledge the receipt of your
 “ letter.

“ I am very glad to find, from the informa-
 “ tion, which your letter contains, and the
 “ conversation I have had with several respect-
 “ able members, who have come from Ireland,
 “ that a general spirit of improvement exists in
 “ that part of the United Kingdom. In re-
 “ gard to sheep, I have no doubt, that the
 “ Cheviot is the breed the best calculated for
 “ a mountainous district*, and the introduction
 “ of the breed into Ireland is one of the
 “ greatest benefits, that could be conferred
 “ upon it. The south Down is an excellent
 “ breed, but is accustomed to dry pasture,
 “ whereas the Cheviot can feed on bogs and
 “ marshes, without being liable to the rot.”

* This subject will be resumed in the sequel of this work.

SECT. 4. *Southern or Argillaceous District.*

OF this district, which includes a great part of the barony of Arklow, and the whole of Shilelagh, I have in the first part of this General View explained, that it consists of rocks and mountains, chiefly containing argillite. The soil is very much interspersed with loose stones and rocks, many of them boulders of granite. The principal feature, in the northern part of this district, is the lands situated on the banks of the Avon and Ovoca.

PARISH

PARISH OF CASTLE M'ADAM.

Number of <i>houses.</i>	Families.	Males.	Females.	Under 24 years.	Above 60 years.	Labourers.	Manufac- turers.
534	524	1487	1425	1604	161	361	113
<i>Miners.</i>	<i>Carriers.</i>	<i>Schools</i>	<i>Male Scholars.</i>	<i>Female ditto.</i>	<i>Mills Stores.</i>	<i>Public Buildings.</i>	—
266	53	4	130	70	5	1 church, 3 chapels.	—

1. *State of Manufactures?*

In this parish there is little or no manufacture, except for home consumption. There is a small quantity of frize manufactured.

2. State of Mines ?

The mines of Cronebane, Ballimurtagh, &c. in this parish, of which an account has already been given.

3. Price of Labour, and of Wages ?

Ten-pence in summer, and eight-pence in winter ; those, who work in the mines, have one shilling the year through.

4. Food of the Poor and its Price ?

It consists of potatoes and oatmeal, made into stirabout ; a very small quantity of wheat and rye mixed is used for bread, in summer, for about six weeks before the potatoes come in. Average price of potatoes, five shillings per barrel, twenty stone to a barrel. Oatmeal, twelve shillings ; at present it sells for eighteen, but this is an extraordinary thing. Rye, twenty four shillings per barrel, and wheat thirty.

5. Clothing of the Poor, and Price ?

Frize, which is about 2s. 6d. a yard, of which they manufacture most of which they wear. Linen 1s. 2d. a yard. Stockings, 2s. 2d. A pair of brogues, 7s. Shoes, 9s. Hats, 4s.

6. Fuel

6. *Fuel of the Poor, and Price?*

Turf, about 2s. a kish, and cordwood, 8s. 8d. per load.

7. *Lodging of the Poor.—Rent of Cabins and Ground?*

They usually pay three guineas for a cabin, and an acre of ground, and as much more for the grafs of a cow.

8. *Tools, implements of Husbandry, and Price?*

The price of a fack or spade, is 2s. 8d.; a shovel, 2s. 2d.; reaping hooks, 1s.; scythes, 4s.; a plough, 1l.; harrow, 1l. 5s. 6d.; car, 2l. 5s. 6d.

9. *Price of Cattle.—State of Markets and Fairs?*

A new milch cow, 10l.; a store cow, 7l.; a fat cow, 10l. Wether sheep, 18l. a score; ewes, 15l.; lambs, 11l. Horses for the use of the county, 12l. each. No market; one fair at Red-crofs.

10. *Price of Hides, Tallow, Wool, Timber, (and other articles) sold?*

Hides, about 1l. 17s. 4d. a cwt.; tallow, 2l. 16s. ditto; wool, 1l. 2s. 9d. per stone. Oak, 2s. 8d. a foot; ash, 2s. 4d.; fir, 2s. The quantity of timber sold is considerable, and supplies all this part of the county with these articles.

11. State of Cultivation.

		ACRES.
Arable.	Wheat	14
	Oats	379
	Barley	36
	Rye	9
	Bere	1
	Potatoes	228
	Rape	0
	Peas	0
	Vetches	0
	Turnips	4
	Flax	0
Other crops	0	
Fallow	0	
Total arable		771

Meadow.

Natural	991
Water Meadow	200

Artificial Grasses.

Clover	11
Trefoil	0
Rye-grass	7
Other grasses	0

Pasture	5102
Plantations	57
Wood	287
Bog	124
Waste	250

} Land incapable of cultivation.

12. *What Manures are used?*13. *Expence of Manures?*

Lime principally. The quantity, forty barrels to an acre. Expence, 4s. per barrel. A small quantity of marle is found on the banks of the Ovoca, of which they put 800 loads to an acre.

14. *How much land held in common or uninclosed?*

None.

15. *Nature of Leases—Quantity of absentee property?*

Leases for three lives. The amount of absentee property is £. 2,250 per annum.

16. *Defects of Practice?—Obstacles to Improvement?*

The defects of practice are, first burning, which, however, is fortunately declining, as appears from the quantity of rye, which is only sown on burned land. Secondly, the want of a proper course of crops. Thirdly, the want of sowing artificial grasses.

The obstacles to improvement are the want of manures. Lime is not only dear, but difficult to be had.

The

The only place, where it is to be bought, is Wicklow, and although it sells for 2*s.* 8*d.* a barrel, a sufficient quantity is not to be procured, and many farmers are obliged to go to Carlow for lime, a distance of thirty miles. The best remedy would be the improvement of the harbours of Wicklow and Arklow. By which means limestone could be brought from Howth, and culm from Wales, at a moderate expense, and making a canal to communicate with the collieries, and limestone quarries of Kilkenny and Carlow.

From the above very minute and accurate answers to the printed queries I circulated, I am obliged to the Rev. James Symes ; and if I could have obtained answers of similar accuracy, I should have been able to have made many important observations, which I cannot at present venture to submit, without further inquiries.

The above account of the population, and state of cultivation, acreable amount, &c. afford room with regard to this parish, to make some deductions of importance.

The number of houses, in the returns of the hearth money collectors, in the whole of this county, are 11,546. Taking the average population at five and an half to a house, which appears to be nearly the truth, the inhabitants may be computed at 58,000, a very small population for so large an extent, amounting only to 2375 in a square mile, and 26.9 acres to each house on an average ; or about 1000 souls to each parish, averaging about 5370 acres.

By

By this account, the parish of Castle M^cAdam contains 524 inhabited houses, and 2912 inhabitants, or 5 and an half to a house. But the density of its population is 14.6 of an acre to a house, or 40.3 in a square mile; yet in this parish there is little or no manufacture, and the whole arable land only 771 acres. A state of prosperity, which can only be ascribed to the money circulated, and the employment afforded by the mines of Cronebane and Ballymurtagh. In support of this, it appears that the number of miners and carriers amount to 319; supposing only 262 of these have families, which is most likely much under the truth, this shews at once, that these mines doubled the population of this parish, and this must have been wholly within the last ten years, as it is within that period they have been set to work with any spirit. That the additional population thus occasioned is not a cumbrous ineffective burthen on the country, but that while it adds to its wealth, it adds also to its force and strength, has in the late necessity of calling that force into effect, been fully evinced. The small but brave and determined corps of yeoman infantry, formed of the miners of Cronebane, and the farmers or carriers connected with the mines, headed, indeed, by three excellent officers, Capt. Mills, Mr. Weaver, and Mr. Blood, afforded the most important support to his Majesty's arms, and with their friends and neighbours, the very active yeomen cavalry of Rathdrum, have continued on duty almost ever since the end of 1797, preserving the whole of the adjacent country from the destruction threatened it, when no sufficient

sufficient force of regular troops could be spared for its defence. Nor did these brave fellows last summer, spare their exertions in repressing the banditti still continuing to infest the mountains, altho' at that time scarce an individual in the corps but could gain by his work at the mines from three to 4s. per day.

From not understanding the value of this kind of industry, and the advantages arising to a country, from capital applied to the bringing to effect mineral product, many people, not immediately interested in the profits thereby arising, contend that the introduction and cultivation of mines is injurious to the agriculture and improvement of a country, by encreasing the price of wages to the labourer, and turning people from improving the surface of the ground, to dig into the bowels of the earth for precarious wealth. The futility of this objection is very fully demonstrated in the General View of the county of Cornwall, where it appears, that the mines situated in a small district, of comparatively barren land, afford a ready market for the productions of the neighbouring more fertile lands. On the very small scale, in which mining is as yet carried on in the parish of Castle M^cAdam, it will be found they are equally favourable to the improvement of agriculture, as they appear by the above statements to be to the population and strength of the country. The money in circulation amongst the farmers, has gradually or rather rapidly enabled them to acquire capital. The cars conveying the ore to Wicklow are enabled to bring back lime at an easy expense. At Cronebane, by a very wise policy, which attaches

attaches them to the soil, Mr. Mills encourages the miners to take land. Rents in the neighbourhood are thereby greatly encreased, and I was a witness to a competition for land in this parish, at a price, which astonished me and several gentlemen, who were well acquainted with the country. It needs not any further argument to prove to gentlemen, how much it is for their own interest as well as the public, to encourage by liberal terms the establishment of companies with sufficient capital, to adventure in the mining business in this part of the country, and which it is but justice to add, the gentlemen here have on all occasions discovered the greatest liberality in so doing. Nor is there any part of Ireland, where more encouragement can be found to strangers settling amongst them.

Captain Mills and Mr. Weaver, the resident managers of the company, have themselves shown a spirited example in the improvement of some land they possess adjoining to the mines. They have reclaimed a part of the mountains, which heretofore was nothing but a wet miry bog and rocks. On the bank of the river they have watered some meadow, which, although a mode pretty much adopted in this part of the country, is commonly done with negligence and without any science. Capt. Mills by laying out the conducting drains, and the collateral cuts, in a proper manner, has not like most others grafs only in patches, but the field equally covered with excellent grafs. By this improvement of making a water meadow of *five acres of land*, the produce pays the rent of the whole farm, consisting of thirty-five acres. What profit

will this gentleman have when he lays down the whole thirty-five, which are all equally favourably situated for water meadow. In this part of the county, and indeed, in all parts of it, they have the best possible opportunity of forming water meadows, and if a piece of land lies tolerably smooth, they always bring the water over it. But of the two hundred acres of water meadow in the parish, I don't know that there are five more that are watered with any skill. I, therefore, wish to point out this improvement of Mr. Mills to the country in general. The whole of this was nothing else than a bed of stones and gravel, brought down by the river, which, with great labour and considerable expense, he cleared, laying it out properly for watering, with regular slopes, and after manuring it well, and laying down to grass, he has made the *best* meadow for its extent in the parish. Mr. King, of Kingston, in the same neighbourhood, has made a wonderful improvement of a piece of ground, before completely waste, consisting of quagmires, rocks, and boulders of granite; it is about eighty acres. By digging deep drains down to the gravel, or solid rocks; by blasting, and otherwise breaking the rocks of granite, with which he fills up his drains, he has, with great perseverance for a number of years, cleared a great part of this ground, by which he has created a permanent property, of an improved value, from what was scarcely worth sixpence an acre, to thirty and forty shillings, independent of the trees he has planted, which, in a few years, of themselves, will be equal to much more than the fee simple of the farm in its former state.

About

About 3 miles from hence is Bally-arthur, situated opposite to the confluence of the Ovoca and the Aghrim river, whose united streams flow from hence to Arklow. Crossing the river at Newbridge, the approach on the left bank for upwards of an English mile is through an oak wood, of by far the finest growth in this county. About half way the ground opens towards the river discovering some fine meadows, and a beautifully situated cottage belonging to Mr. Symes, rented by John Camac Esq. one of the proprietors of Ballymurtagh copper mine, on 35 acres of this valuable land granted to him for his life by the late General Symes for a very small acknowledgement, as a proof of his desire to encourage settlers for the purpose of working the mines, although they were not on his own estate. Which circumstance I think proper to remark as a great inducement to gentlemen of capital from England, who may wish to form establishments in this part of the kingdom. Passing Woodville you enter a finely opening valley discovering another wood, sweeping round the high banks over the river, and ascending through coppice interspersed with some fine beech, you rise to the lawn adjoining the mansion of Mr. Symes. From hence the view of the meeting of the rivers and the banks on all sides, covered with wood, affords a most agreeable scene. But farther on at a little distance from the house, is a most magnificent terrace, of nearly three quarters of a mile in length, planted with pine and oak of 70 and 80 feet in height. Underneath a sloping bank reclines, near a quarter of a mile broad, covered with wood, and at the foot
of

of which, some hundred yards below, the Ovoca now united with the Aghrim river rolls a noble tide. The murmuring of the stream, the waving of the pines, the surrounding hills covered with woods, altogether render this terrace superior to any thing I have seen, while through the trees, the finely improved meadows, immediately under a part of this wood below the terrace, afford a most interesting view in themselves, but much more to the friend of agriculture. A few years ago, they formed a most unsightly and impenetrable brake, covered with furze, briars, rocks, broken up here and there by stagnating pools from the overflow of the river. With vast labour, the whole of these savage tenants of the mead have been completely rooted out. The Kentish turn wrest was at work in one part; in another, the operation of drilling wheat was going on in beautiful progression, while on an equal space, the same grain was committing to the ground in the common broadcast mode of the country. In the higher grounds of the demesne Mr. Symes has made similar trials, and which he is this spring to extend to every species of grain sown in the country. He has done more; the gentlemen of the country having thought fit to evince their desire of seconding the views of the Dublin Society, by establishing a society for the improvement of agriculture within the county, Mr. Symes has taken upon him the office of Secretary, and has most liberally offered the whole of his demesne, to make, at his own expence, whatever experiments may be considered the best adapted, for the general improvement. Having the command of a fine stream of water in his
upper

upper grounds, he is laying them out on a superior plan for water meadow, and in every respect is exhibiting an example, which cannot be too highly valued. Near Christmas I again viewed the experiments of the drill and broad cart husbandry with Lord Powerscourt, and several gentlemen of the country. The evident superiority of the drill, together with the vast saving of seed, equal to more than the rent of the land, made every one resolve to follow his example. But what gave me particular pleasure to learn was, that the small farmers in the neighbourhood have requested Mr. Symes to lend them his drill plough for their spring corn; which he has not only complied with, but told them he would send his own man with the plough and mule, to sow their grounds for them.

When I have to add that so little are these improvements practised, that this is the first regular experiment made in this county, and from every thing I have heard, I believe the first in Ireland; in order to exhibit the advantages of the drill husbandry, it will, I flatter myself, be deemed very proper to register this beginning. The only other experiment at all made was in the same year, (1800), arising from the following circumstance. At the spring assizes, on being introduced to the gentlemen of the county, by Mr. Henry Tighe, a very excellent farmer, near Wicklow, Mr. Clements told me, he had Mr. Cooke's drill plough given to him some years ago, but could not put it together. I desired him to send it to Mrs. Tighe's at Rosanna, and having put it in order, Mr. Tighe sowed some oats with it, and Mr. Clements also some
1
barley.

barley. Both were late, but the oats were very remarkable for their growth, so much so, that Mrs. Tighe has got a drill plough since from Mr. Cooke, in order to make use of it in every crop of grain on the farm. Mr. Clements also intends trying the drill husbandry on an extensive scale. Mr. Symes's drill is that made by Macdougall. So that in another year we shall have the result exhibited of those, of all others the most useful experiments in husbandry.

From Bally-Arthur to Arklow, about four miles, the country on each side of the Ovoca, is covered with wood, as also are the vallies on the banks of the Aghrim river. A great part of these woods, from want of being inclosed or copsed up (as it is called) after cutting, are very much destroyed by cattle. On the low grounds on the banks of the Ovoca, there is much waste land, all of which might be cultivated, equal to what we have described at Bally-Arthur. Leaving the banks of the Ovoca, and proceeding to the barony of Shilelagh, there is some very good cultivation at Ballycooge, Mr. Graham's, and at Clone, a farm of Mr. Charles Coates, on the skirts of Mount Croughan. I was much pleased also to find here, that all the little farmers were cultivating turnips. The gold found in this neighbourhood, and the money laid out by government in the subsequent search (which is made by the country people, employed by Capt. Mills) for this treasure, has visibly enabled them to extend their cultivation. One amongst many proofs, that it is the want of capital not the want of *industry*, that impedes the husbandry of this country.

The

The half barony of Shilelagh consists of only 27,000 acres, but in addition, is the district of Cashaw, both the property of Earl Fitzwilliam, and together amounting to about 47,000 acres. The whole of this country is mountainous, and anciently covered with wood; from whence came the famous Shilelagh oak, but of which there is not now any remains*. In this part of the county, the cultivation of their land depends on the use of lime, which they bring from Carlow, at the distance of nineteen and twenty-one miles, at which place they pay 2*s.* 8*d.* per barrel, from which, therefore, it requires a large capital to cultivate to any extent. There are, however, instances of very spirited cultivation. Capt. Swan had this year seventy Irish acres under tillage. The Rev. Mr. Symes, of Ballybeg, has the most complete and spirited management to be found on any farm in this county, or, perhaps, any other in Ireland, on a similar tenure, on that of an old life, the twenty-one years, the collateral security, being expired. His inclosures, planting, draining, and other permanent improvements, are as complete in every respect, as if the fee simple of the land were in his own possession. His planting remarkably ornamental, and thriving. He raises all his trees with great care, and by repeatedly transplanting them while young, their roots become uncommonly vigorous, and when put out seldom or ever fail. Last year, which from its great drought was extremely unfavourable, he did not lose one tree, although

* See Mr. Hayes's elegant description of this wood.

although he planted many hundreds of Weymouth pine, larch, silver fir, and beech, so late as the month of May. Mr. Chamney, of Ballyraheen also, on the side of a mountain, is making extensive improvements; but to give any description of the present state of these, and the other gentlemen's husbandry, in this part of the country, would take up too much of this work; nor would it at present be doing them justice, as the whole country having in a great degree remained uncultivated for these two years back, they have not yet got their farms into any proper order. Before that period they were going on in making great advances in cultivation, even to the summits of the mountains. They are, however, all to be severely reprehended, for the neglect of green crops and artificial grasses. After potatoes they have generally barley, very little wheat, except what is for their own use. With lime, they generally take three, four, or five crops of oats and barley alternately, and then turn out the land to rest, without any fallow or fallow crop, to clean it from weeds, and seldom or never lay it down to grass with seeds. Captain Swan, of Tumbrean, whose extensive tillage we have already mentioned, spares no expence on the culture of his farm, nor have I seen any where better inclosures, or better laid out ground. His farm is, for the most part, a poor soil, on a siliceous schistus; yet by sparing no expence in collecting dung, for which purpose he winters a great number of cattle in his farm yard, and liming with great spirit, his crops are excellent.

The two Mr. Blaneys in the same neighbourhood, are very capital farmers, all in the same old husbandry, and most industrious tenants. The average produce in this district of oats, is thirteen barrels an acre, eleven of barley, and seven barrels of wheat, which is a crop not approved of, from the soil being too shallow. In the parish of Carnew, the produce of grain this year was estimated at 12,000 barrels, which, at 12 barrels an acre, would give 1000 acres under cultivation. Mr. Binks in this parish also, has made some very spirited improvements by inclosing and draining. Mr. Bruster, near Coolatin, is also a very capital farmer; the two Mr. Braddells, and Mr. Douce, deserve to be particularly commended. Indeed, every *resident* tenant of Earl Fitzwilliam, on leases, which in this county are deemed extremely short, that is, one life or twenty-one years; are carrying on improvements with a spirit and industry, which I have not seen equalled by tenants, in any other part of the county, or scarcely in any part of Ireland. Certainly not in any district of equal magnitude, are there so many respectable and spirited farmers. All these gentlemen are in some degree acquainted with modern improvements, and seem only waiting for the complete restoration of quiet, both to introduce the turnip husbandry, experiments in the drill culture, and the improvement of their breed of cattle and sheep. So that in the course of eight or ten years, I expect the system of farming here will be equally complete with what it is in any part of the united kingdom. Mr. Swan, of Knockloe, brother of the gentleman
 already

already mentioned, has already improved his sheep by a cross from the Dishley, and intends proceeding on a great scale.

The great object, however, to accelerate the improvement of this country, is to form a navigable communication with the limestone and collieries of the counties of Carlow and Kilkenny, in which some measures are likely to be proceeded upon without delay, and I hope will be carried into effect in the best manner.

On the whole of my Lord Fitzwilliam's property, what is called in England, *tenant's right*, is universally respected; when a lease is expired, a third person seldom interferes. The former occupier, or his heir at law, and even his devisee, is supposed to have a *tenant right* to the premises. He is content to pay a reasonable advance for the improved state, at which his farm may have arrived, a deduction being always allowed for permanent improvements. This is easily and amicably adjusted, between his lordship's agent and the tenant, with a reference to Lord Fitzwilliam, who decides on every thing himself, and that in so equitable a manner, as never to leave the least room for doubt or complaint.

The adherence to this custom of tenant-right, according to the excellent author of the Enquiry into the Wealth of Nations, so favourable to the yeomanry, has contributed more to the present grandeur of England, than all their boasted regulations of commerce taken together.

It is, by the tenants having the *fullest confidence in the continued adherence to this custom*, that on leases of one life, or twenty-one years, more spirited improvements are made on this estate, notwithstanding its disadvantages of soil, and distance from manure, than on any other estates of non-residents in this county, or perhaps on any of the estates of non-residents in any part of Ireland.

These circumstances of prosperity and improvement are by no means confined to this part of the Rockingham estate; but from the same excellent principle being extended to all parts of the property, that of an invariable adherence to *tenant-right*, the same spirit of improvement is every where exhibited. This is conspicuously evident along the skirts of the mountains, and the numerous vales in the lower part of the barony of Balinacor, and in the barony of Talbotstown, particularly around Humewood, the seat of Mr. Hume, one of the representatives of the county in parliament, to whose ancestor is this part of the county, indebted for the introduction of the linen manufacture, and of that branch of the woollen manufacture, consisting of flannels and frize, which, until the late disturbances, was very considerable in this part of the county. Mr. Wainright shewed me a very interesting account of that gentleman's, of the measures he proposed to the Rockingham family, wrote by himself in the year 1727; he, Mr. Hume, being then agent for the estate.

It is in this very interesting to remark, that although at that period Mr. Hume evidently preferred the introduction of the linen manufacture, and took very effectual measures for that purpose, yet, although the tenants still make a sufficient quantity of linen for domestic purposes, the woollen manufacture soon attained and continued to keep the ascendancy. A very presumptive proof, that the woollen manufacture is naturally the staple manufacture of this part of Ireland, and which, from the superior advantages now afforded to this manufacture, by the act of union, may be expected greatly to be extended, for the carrying on several branches, for which there are in many parts of these mountainous districts, the advantages of good falls for mills, and abundance of turf for fuel.

While at the same time, this admirable custom on the estate of Lord Fitzwilliam, of *tenant right*, has led to the aggrandizement of the family, by the gradual improvement of these mountainous districts; it has in another respect tended to the highest advantage of the community at large, by the formation of a *numerous and brave yeomanry*, whose distinguished bravery and conduct, during the heat of the rebellion, was such that Lord Fitzwilliam himself came to Ireland, to put himself at their head, on the French landing at Killala.

To the two yeoman corps on this estate, one under the command of Mr. Wainright, and the other under the command of Mr. Hume, is the whole of this country much indebted, for their spirit and exertions.

Mr.

Mr. Hume had the misfortune to loose his father early in the rebellion, being killed by the rebels. In assuming the command of his father's corps, to which he was called by the unanimous voice of the brave men who composed it, he avenged his father's death, by pursuing the rebels through every recess of the mountains, and encountering them with the most determined bravery*. But like a truly brave man, no instance of unnecessary severity was by him ever exercised in the performance of his duty to his king and country; nor can his sovereign boast of a braver soldier, nor of a more loyal subject. The suffrages of his companions in arms called him to succeed his father, as their representative in parliament, and there is no doubt, but that he will give equal proofs of his conduct in the House, as he has given of his courage in the field.

* Captain Hume was in fourteen different actions against the rebels, in many of which there was not a little hard fighting.

PART III.

HEADS OF ENQUIRY,

SUGGESTED BY

THE DUBLIN SOCIETY.

CHAPTER I.

AGRICULTURE.

SECTION I.

Mode of Culture.

 Pater ipse colendi

Haud facile esse viam voluit, primus que per artem,

Movit agros, curis acuens mortalia corda,

VIRGIL.

IN all situations, the culture is in some measure directed by the natural situation and circumstances, but even there it is often long before men take advantage of the gifts, which nature presents to them.

In few countries, hardly any in Europe, has the industry of the people, hitherto been effectually directed to the cultivation of the soil; nor has agriculture been made that primary object with governments,

to be which it is so highly entitled. Commerce and manufactures have been the first objects of attention; these forming naturally their seats, on the maritime coasts and great rivers, have pointed out the vicinity of these as chief subjects of cultivation. Late, and slow, has been the progress of the surplus capital, acquired in these branches of industry, in carrying husbandry into the internal parts of the country.

In England, the surplus capital acquired by her extended commerce, has, of late years, occasioned a rapid diffusion of that capital into the country, and marked its progress by proportional improvements in agriculture, and the best means of its advancement, that of a general communication to all parts of the country, by inland navigations.

In Ireland, the want of the diffusion of capital has occasioned the very first improvements in the culture of her soil, to remain in a state of weakness and infancy. The want of inclosing, building, draining, is evident to the most superficial observer. And, while these are wanting, it is in vain to expect the same uniform appearance of improved cultivation, which is beheld with so much delight, in some of the most advanced districts, in agricultural improvement, in other parts of the united kingdom.

For these last twenty years, capital in Ireland has been gradually, and of late years rapidly accumulating, amongst the agricultural part of the community. A great extension of cultivation has, in consequence,
taken



taken place. The high price of every kind of produce has stimulated industry, and, notwithstanding the distractions, which for these three last years have taken place, there never was a period when more assiduous exertion has appeared amongst all classes, particularly amongst the lower classes of farmers, in cultivating their lands. Except a very few tracts near the mountains, this seems in the strongest degree evident, not only in the county of Wicklow, but in the neighbouring county of Wexford; and I believe, it will be found, that in almost every place double, and I am told in some districts* seven times more land is under grain this year, than has ever been known in the memory of man.

In the county of Wicklow, I found it universally remarked, that the *mode of cultivation* has, of late years, also been improved. Farmers now seldom crop their lands, without manuring with either marle or lime. Not many years back, barley, or perhaps, wheat after potatoes, and then oats or barley, as long as it would barely return the seed was the usual practice; and where they took a crop without potatoes, oats on the lay, and repeated as long as the ground would bear it; with sometimes an intermediate crop of barley, when they could collect a little road-stuff, or procure a few barrels of lime to scatter on the ground.

But, although this alteration for the better, has generally taken place, it must still be allowed, that the
common

* In the barony of Forth, in the county of Wexford.

common modes of husbandry are far from being such, as might be expected from the improved state of this branch of employment.

In the consideration, however, of the *practice* of this district in the culture of the soil, it is not our intention to enter into discussions foreign to the objects of the farmers of this district; but keeping in view the principle, that culture is in some measure directed by natural situation and circumstances, it is our object to lead to such investigation, and easy experiment, as may improve that practice by easy and simple progression; without expecting that the highest degree of perfection, or the refinements of the art, can be suddenly introduced, or rendered universal.

We shall, therefore, in the first place, endeavour to give some idea of the nature and composition of the various soils of the district, and then consider the application of the various manures to the different kind of soil.

By soil, is understood that part of the land, which is the basis of vegetation, and as such, the object of cultivation. That, which has been called the subsoil, is the next layer or bed of earth, to the soil.

All soil consists of the combination of two or more of the primitive earths, of clay or argill, of the siliceous earth or sand, or of calcareous earth or chalk.

In this district there is no chalk (nor I believe in any part of Ireland) naturally forming a part of the soil, as frequently happens in England; nor in the county of Wicklow, did I find the various species of marles naturally

naturally mixt with the soil, but generally in beds or layers, at some feet depth below the surface.

The natural soil consists of common clay and silex mixt in various proportions and of various degrees of fineness, from the coarse gravelly to very minute siliceous earth and of various degrees of fertility.

The prevailing soils, under the mountains in the low grounds, are clayey loam, varying to the gravelly and heathy soils, on the sides of the hills, and higher grounds. In some part of low grounds, and on the mountains for a great extent, the boggy soil prevails.

When soil contains too much argil or clay, it is rendered too retentive, and does not allow the water to pass to the roots of plants. When, on the contrary, it contains too much siliceous earth or sand, the water passes too quickly through the soil. It is on the soil having such a texture, as to convey a sufficient quantity of water to the roots of plants, as required for their nourishment, and that it should not remain too long stagnate under the soil, or on its surface, that much of the relative fertility of soils depends. As there is in this county very little extended plain, the retentive soils are found to be the most improveable, and best for tillage crops. They, therefore, may be considered the most fertile, or most easily rendered fertile.

Even the heathy and gravelly soils discover a considerable degree of natural fertility, by their tendency to abundant natural produce of heath, furze, and coarse
grasses

grasses; by manuring, draining, and clearing such lands of rocks &c., and instead of grain crops, making the production of grass the primary object, these lands may be rendered of much greater profit to the farmer than at present, and of course to the proprietor.

Any soil, however, to have that degree of fertility, so as to produce the plants best adapted for the food of man, and the most useful animals, must contain a due proportion not only of the argillaceous and siliceous earths, but also of the calcareous, by which is understood lime, marl, or chalk. It must also contain what is called the soluble carbonaceous principle, or coal in such a state as to be soluble in water. This is found to be contained in all vegetable matter, and by being dissolved in water and conveyed by it to the roots of plants, constitutes the principal part of their food. The mode, in which this is supplied by nature, is by the decomposition and resolution of decayed vegetables, and which is produced by art in accelerating this decomposition in various ways, and by slow and smothered combustion of vegetable matter. But it is produced in greatest abundance by the more complete decomposition, arising *from vegetable matter passing through the stomach and bowels of animals.* It is also furnished in a state of air or gas by calcareous earth, by the decomposition of water in vegetation, and in a great variety of ways in the great cabinet of nature.

It

It is on these principles, which of late have been fully explained by writers on agricultural chemistry*, that what is called the new husbandry is founded. The authors of which, and those, who follow it with most accuracy, were not acquainted until lately with this new discovery of the food of plants, which we owe to M. Hassenfratz, but which is now fully confirmed by experiment and observation.

The great object with the professors of the new husbandry is, by *summer* and *winter* feeding a *stock* of *cattle*, to return to the land all the vegetable food, of which it had been deprived in producing grain or white crops, providing thereby a sufficient stock of dung to manure the whole of the land. By *eradicating every kind of weed by the use of the hoe*, so that nothing may be suffered to grow, but the plants you want to grow. In the use, also, of the various improved and new invented implements, for the purpose of expediting or abridging labour, and in the judicious selection of domestic animals; also, the use of irrigation and flooding, on the most improved plan.

The usage of the old husbandry (which prevails in its very worst state in this district,) is to reject the hoe culture†, to foul the land by repeated corn crops, and to clear it partially and insufficiently, by summer
fallows

* This is admirably treated by Mr. Kirwan in his excellent treatise on the use and application of manure.

† In this district the hoe culture is universally practised with regard to potatoes with great advantage, but it has never occurred to them, that it might with equal advantage be extended to all other crops.

fallows, or to feed it in its foul state, for a temporary ley, to neglect wholly the improvements of the breed of animals for stock and labour.

Here they not only foul their lands by repeated crops, but they seldom or ever make use of a summer fallow to clean it, or even lay it down to grass seeds, leaving it to recover by slow degrees, after they have completely fouled it with weeds. Nothing can be so disgusting and shameful, as the state of the land, turned out, as they call it, full of every kind of abominable weed, that has been collected in the land, during their years of tillage. In proportion to the natural fertility or strength of the staple, the more disgusting the appearance, from greater luxuriance, of those glaring proofs of indolence and ignorance.

By the lead, which I have every reason to expect, many of the resident gentlemen in this district will speedily take, in introducing the new husbandry, in all its parts, I may not be too sanguine in looking forward to a speedy alteration for the better, in the general modes of farming in the county.

As much, however, of the best farming in the county depends on the use of marle, and as the proper use of this is capable of being made the foundation of the highest perfection of good husbandry, and of extending cultivation in almost an indefinite degree, I shall beg leave to go a little more minutely into the consideration of this subject, with the view of turning the attention of the gentlemen and farmers, to make experiments on the best modes of its use and application.

Marle—its Use and Application.

In the eastern district, which we have described, the best argillaceous marles are of a blueish black, or black colour, inclining sometimes to lead grey, and very rarely to chocolate brown. I found it to contain from twenty per cent. to thirty-four per cent. of calcareous earth. The residuum is clay, one third very minute siliceous earth, and two-thirds argillaceous.

The following experiment was made this year, (1800), by Mr. Quin, at Bally-Ornan, in order to ascertain the comparative effects of dung, marle, and lime, as manures for potatoes, which I cannot give better than in his own words to me, in a letter dated October 29, 1800.

“ Each piece contained precisely forty square yards, (ridge and furrow included) all the experiments being made in the lazy-bed manner, on an old sod once ploughed before the manure was laid down; the potatoe cuttings of exactly the same quality, and in the same quantity, and on the same day, early in May last, were laid on the manures and covered in the usual manner from the trenches. The produce this day has been as follows:—

Dunged piece produced eight stone and an half, equal to eighty-three barrels, six stone per acre.

The marled piece produced seven stone, equal to sixty-eight barrels, twelve stone, per acre.

The limed piece four stone and an half, equal to forty-four barrels, two stone, per acre.

The conclusion to be drawn from the experiment are obviously.

1st. That lime, in this district, is an expensive and unproductive manure for *potatoes*.

2d. That dung produces a greater crop than marle, but at a much greater expence,

3d. That marle produces at a small expence (if contiguous to a field) a tolerably average crop; and if the benefit arising from a moderate marling (viz. about 5 or 600 car-loads per acre,) to future crops be considered, there appears to me to be no doubt, with respect to its superiority to dung in point of economy, and permanent improvement, of stiff worn out ground. I shall now add, an account of the average produce of that part of the field in general, which was manured with stable dung, when compared with a portion of it manured with the scrapings of the adjoining road, formed originally of limestone gravel chiefly. The dunged part on an average of two portions, apparently equally bad and good, containing 40 yards each, yielded seven stone and an half, equal to seventy-three barrels, one stone per acre. That manured with road stuff, taken in the same manner, yielded five stone, equal to fifty-eight barrels, sixteen stone, per acre. Hence marle is to road-stuff as sixty-eight to fifty-eight."

The above experiments made by Mr. Quin are very valuable, but not entirely conclusive with regard to lime, as that depends much upon the season, and I found from Mr. Archer, that he had frequently produced excellent potatoes, and equal to those planted with dung, from lime alone.

About five years ago, he limed a stubble field, (ploughed from the ley, and having one crop of oats) at the rate of something under forty barrels an acre, when drilled with the plough, he put in as far as he could judge, from twelve to fourteen barrels of lime in the drills, on which he placed the potatoes, covering them, and afterwards horse hoeing the crop in the usual manner. The produce, which was the apple potatoe, was equal to any thing he ever experienced, the size remarkable and which is supposed not to be customary on limed ground.

This year, (1800) he had better than an acre from lime, but did not put them in drills.

In limed ground, Mr. Archer adds, that the potatoes should be planted early, and should be generally in dry situations.

Near Roundwood, in the mountains, I am informed most excellent potatoes are produced from liming only, and in equal abundance to dung. The soil is light heathy; limed about sixty barrels per acre, ploughed the lime after being spread, and harrowed the field to make it level, the potatoes in drills. Afterwards one crop of barley, and two of oats, or four crops of oats, and then manure again; but much better one crop of barley, and laid down with hay-seeds.

feeds. The greatest part of the land from the greater Sugar-loaf, or Lord Powerscourt's deer-park, might be reclaimed by similar improvement. The names of the farmers most distinguished for this culture, Keegan, Sutton, Murphy, Lawler, Coleman, Booth, and Smith, &c. This information communicated by Mr. Robert Sharkey, of Sea-view, near Bray.

Mr. Archer further informed me, that he has been accustomed to plant potatoes on old lay, ploughed once and manured with shell marle. This shell marle seems to be very similar to effect lime; when treated with the muriatic acid and placed on a filtre, there is nothing left on the filtre but a very few vegetable fibres.

He spread about 300 car-loads to the acre in the acre in the lazy-bed manner, placing the cuttings on the marle, and covering from the trench in the usual manner. The produce equal to those planted adjoining to them on dung, and what was remarkable, the tops were equally luxuriant as those on the dunged ground.

The practice of taking potatoes with lime is common, but they generally take them in the lazy-bed way, which is improper. The ground should be well ploughed from the stubble, ploughing in the lime, and in spring cross-ploughed; in putting in the potatoes, lime, as before stated, should be put in the drills, from a dozen to fourteen barrels an acre.

But although it would appear from the above statements, that lime will produce potatoes of a very good kind and abundant; it is in many parts of this district
 very

very expensive, whereas marle, when contiguous, is relatively (if laid on in moderate quantities of five or six hundred car-loads an acre) extremely economical.

My Lord Monck, in the neighbourhood of Charleville, pays 2*d.* a car-load for digging and put out marle from the pit adjoining the field. Others I find do it cheaper, but three-halfpence may be considered as the average price, when the pit is in the field or adjoining to it.

We have already seen, that in the western districts excellent crops of potatoes are produced from limestone gravel, on the wet moory soil, there described. In this district it is the practice to put out their marle in June and July, and to let it remain until September the following year, and then to plough for wheat, or to let it lie until the spring after, and take barley.

Instead of this expensive mode, by letting the ground lie so long without a crop, it would be more advantageous, that they should marle to the amount of 6 or even 800 car-loads in summer, and after letting it lay all winter, take a crop of potatoes in the spring in the lazybed manner, covering lightly from the trenches. After the potatoes are landed, laying the ground up in furrows, so as to be fully exposed to the winter frosts. Then take a crop of barley, and after this tares or vetches, with which, foil the working cattle and horses, and putting out the dung produced, take a crop of wheat, after which, laying up the land in furrow to the frost, a crop of barley, with clovers in the following proportion. White clover by weight
four

four parts red ; ditto, two ; trefoil, one part ; of this mixture from twenty-one pound to twenty-five are sufficient for an acre. Grass-seeds sown with clover often stifle them, and in general, land becomes well stocked with natural grasses, by the time the clover dies away.

If upon this lay it is found necessary, an additional manure of marle may be put out, a crop of oats taken next spring from the lay, and immediately after the ground to be opened in furrows and exposed to the winter frosts ; in spring, cross-ploughed and well harrowed ; put in potatoes in drills, with dung over the potatoes, at the rate of 160 car-loads an acre, or one car-load to a square perch, after which wheat, then barley, with clover and trefoil, as before.

It is certain, much improvement would be made in the produce of the greatest part of this district, by following the management here prescribed, and certainly nothing can be more easy and simple, than making the experiment. But a still more perfect mode of management will be explained in the section on the course of crops.

The advantage of having a crop of potatoes the spring after marling, instead of letting the ground lie idle, is obvious, and as the marle would again be exposed to the winter frosts, it would have two winters and one summer, before a crop of grain was taken. The reason also the lazybed is preferred is, that the marle, still continuing on the old sod or lay, would have time sufficient to destroy or decompose the vegetable matter of the lay, before it was ploughed, which would

would not take place until you took out the potatoes, the profit of which would pay all the expence of marling, with a furplus of profit, and the future crops be clear. For example,

	£.	s.	d.
800 car-loads an acre, at three-halfpence,	5	0	3
Planting and second-spitting potatoes, -	4	11	0
Digging out when ripe and picking, -	4	19	7½
	<hr/>		
	£. 14	10	10½
	<hr/>		

Taking then the produce, as above stated, at sixty-eight barrels an acre, and allowing twelve barrels for feed, you have a clear produce of fifty-six barrels of potatoes an acre, which, at the old price of five shillings per barrel, would amount to £.16 10s. an acre, leaving £.2 profit, which would very amply allow for rent, over and above all expence of marling.

SECT. 2. *Extent of Culture.*

To convey precise ideas on subjects, which seem perfectly familiar, is by no means always so easy, as it at first sight may appear. The vague and indefinite application of terms, commonly in use, render it difficult to make a proper choice of such, as may convey the meaning we intend.

To

To dignify with the name of culture the miserable practice of scratching the surface of the ground with a plow, until it is so completely exhausted of every principle of fertility, as to be capable of producing neither food [for man, nor beast, is a solecism of expression hardly to be endured.

In this county, with very few exceptions, the operation of entering a plough into the ground is attended with never failing destruction to the land, rapidly hastening that dissolution, which the rains and storms are constantly, though gradually, producing, on those parts of the globe, which are elevated above the surface of the sea.

Let even the natural fertility of the soil be increased, by burning of its surface, by marle, by lime, or even by animal manure, the practice leads to the same end. A longer or shorter period is only thereby required, to arrive at the completion of exhaustion.

The extent of such a pernicious species of industry, whether induced by the rapacity of the landholder, the avarice of the tenant, or the ignorance and indolence of both is equally detrimental to the interests of the community. It will be a glorious and inestimable benefit conferred on this island, and the British empire, if the inquiries now instituted have the effect of putting a period to proceedings so destructive.

The censure hereby intended to be conveyed, is by no means to be confined to this county, nor to this island. The printed reports of the several counties in Great Britain evidently prove the poverty and wretchedness, consequent on this practice of exhausting the land by repeated crops.

“ *Most*

“ Most of the ley land in Great Britain exhibits a picture of starvation, in consequence of its having been cropped with corn, so long as it would bear any.” Corn unquestionably exhausts the fertility of land in a very great degree; of course, an unremitting continuance of corn crops would necessarily destroy the fertilizing principles of the best land; and hence it follows, that the poverty of any soil will be just in the proportion of the number of crops it has produced. The great evils is, that farmers in general are anxious to have, as much as possible, their land in corn. Many of them sow wheat, even during so long a time as the land will return a crop equal to the seed sown; then barley, and afterwards oats, in constant succession, till the land, wholly wearied out and exhausted by such treatment, refuses to grow any thing but weeds. It is then suffered to rest, and when it has in some measure recovered itself, by the influence of the atmosphere, and by the dung of young stock, which its worthless herbage barely keeps from starving, it is, towards the conclusion of their leases, again subjected to the scourge of corn growing, without mercy*.”

“ The Anglesea method of cropping land, naturally extremely fertile, with wheat and barley alternately, brought on the necessity of giving up wheat; barley and oats were next grown alternately, which, in a short time, sickened the land of barley. Then, as a last resource, oats after oats, till it could not bear them.

* See the Report of the county of Middlesex, page 156.

them. This county has, in general, been thus left to keep some young cattle from starving; and the inhabitants, in their turns, are as impoverished as the land. Indeed, it was to be expected, and they have literally exchanged their wheaten loaf for the barley or oaten cake."

"Mr. Hassell, in his Report of Carmarthen, says, that the people have impoverished the soil, and the soil in its turn has impoverished them, and amply revenged the wrongs it suffered by the farmers. Put a sloven upon ever so rich a soil, in ever so good condition, let him impoverish his farm, and I will answer for it, the farm will pay back in his own coin, and impoverish him, unless he runs away from it."

In my Report of Cornwall, I have stated, that it is the common practice to pare and burn the furze crofts, and to take as many crops of corn in succession, as the land will bear, just sufficient to return the seed and labour. It is then left to recover itself, which is generally from 25 to 30 years, when the same practice is again renewed.

In the county of Wicklow I do not know a single farm, held by a common farmer, on which the eye is not distressed by fields turned out to rest, as they call it, in this opprobrious state, full of weeds and rubbish of every kind. Often, indeed, perfectly naked, unable to bear even the worst of weeds. The period it may take to continue in a state of rest, until it recovers such a degree of fertility, as is necessary to allow a repetition of the same operations, is different according to the nature of the soil and situation. The tendency

dency in this island of the soil to reproduce the natural grasses appears, as far as I have been able to observe, on land in similar circumstances, much greater than in the midland counties in England, or even in the moist climate of Devon and Cornwall.*

This observation indicates either a superior fertility in the soil and climate of Ireland, or that the operations of the plough being of a later date in Ireland, the principles of primordial fertility are not so much wasted as they are in England.

From the youth, perhaps, of Ireland, in the old husbandry, may be inferred its superior strength, and capability of produce. If the constitution of the soil should also claim a greater share of inherent vigour, and the climate present no obstacles to the maturity of its fruits, may it not be affirmed that abounding happiness and prosperity wait only on the due cultivation of the land, and an enlightened practice in the agriculture of the island?

* An English nobleman of high rank, who is himself an excellent farmer, and well acquainted with the West of England, and even the most grassy part of it, acknowledged last summer, when I had the pleasure of meeting him in the South of Ireland, the truth of this observation, but denied its being equal in the production of grain. Is not this to be attributed solely to the inferior management, with respect to grain crops? This is a subject of inquiry of the highest importance.

SECT. 3. *Course of Crops.*

No change of opinion has, perhaps, ever taken place in England so rapidly and so extensively, and certainly no change of equal benefit to the interest of mankind, as has that of the complete conviction of the superior excellence of that practice, which, altho' styled the *new husbandry*, has been practised for these thousand years in China, Arabia, and Japan.

It consists, in fact, in introducing the system, practised in the garden, into the culture of the field. The principle depends on the application of manure to its proper purposes; the growth of plants for "the food of man, and the most useful animals," and "the complete extirpation of weeds by the hoe." The consequence of which is, the total abolition of fallowing "the miserable substitute of former times" for manure, and the extirpation of weeds by the hoe system, and with this abolition, the establishing such a rotation of crops, as will effectually return to the soil the principles of fertility, of which it is deprived by the crops, which it is thus made to yield for the use of man.

"This rotation of crops is one of the most important subjects, that can occupy the attention or exercise the ingenuity and skill of an agriculturist."

It has hitherto been little attended to by the cultivator, and prescriptions for that purpose have been multiplied to an infinite number. I have by me a treatise on agriculture, by a Professor of botany, in Cambridge, who has given a rotation of crops, including a course for 31 years in succession.

“The various systems of this nature seem to me to favour more of the pedantry of the science, than to answer any useful purpose.”

That man observes the best course, who drains, pulverises, and cleans his land, keeping it in constant heart, with animal manure. He may easily bid defiance to all regularity of cropping, and at any time take from his field the species of crop he judges most for his advantage, whether corn, pulse, or grass.

In the best broadcast system it is held, that corn ought never to be succeeded by corn; but neither in England, nor in this island, have I met with any farmer, who adheres to so excellent a rule.

“An entire extirpation of weeds, and the treating
 “of a field like a garden, is repaid by the advantage
 “of perpetual cropping. Without including warped
 “lands, or those slips of the sea coast, the fertility of
 “which is almost inexhaustible, it is well known,
 “that potatoes, and even wheat, have been grown
 “many years together with great success; and I
 “have myself known very middling land to bear seven
 “successive crops of beans, the last the best of all,
 “and the land in the finest tilth. Hoed wheat re-
 “peated would be a great and infallible mean of
 “replenishing our markets after a scarcity of that in-
 “dispensable

“dispensable article; and even where the culture is not so perfect, but the wheat broad cast, alternate wheat and beans, a course well known to be successful, might have great effect.”

In confirmation of what is said above, it is a fact, that in the parish of Carran, in the county of Wexford, alternate crops of wheat and beans have been taken for seventy years together. In the carse of Gowrie, in Scotland, alternate crops of wheat, pease, barley, beans, have been taken from time immemorial.

In both those circumstances, the land is uncommonly rich, but it may be laid down as a maxim, that land, in general, will not bear, without injury, a crop of corn every two years. Yet in this county, and most parts of Ireland, they always take even two, and more commonly three corn crops in succession; a practice which must be condemned by every intelligent farmer on the slightest reflection.

The great obstacle to the general adoption of a proper course of crops arises from the precarious nature of a tenant's interest in the ground, which impells him to draw as much from the land as he can, during his lease, which can only be done by cropping in a way, which the land cannot sustain in perpetuity. The want also of capital, in the common farmers in Ireland, leads them, when they are at the expence of manuring their lands, to try to get as speedy and considerable a return, for the money laid out, as they can.

But

By those tenants, however, who have leases for ever, of which there are a great number in this county, and by those, who, by the *custom of the estate*, have their farms consequent on their improvements, almost as certain as if they had them under a covenant of being renewable for ever, I would hope these observations will not be treated with contempt.

In this county, in general, the terms of the leases are encouraging to the tenant rather than otherwise, being most of them on a life or lives, with a term of years, which ever last longest. On the properties of residents generally thirty-one years, or three lives; on those of non-residents, one life or twenty-one years.

In this respect, the farmer in Ireland enjoys a very superior advantage to those of the same description in North Britain*. In Ireland, a life interest in a farm gives the privilege of a vote for a representative in parliament, by which means leases on lives are very general, and, as these votes are likely to become more important, therefore such leases are likely to be more universal. In Scotland, where no such privilege is attached to a life-rent interest, leases on lives are hardly known, and the term of a lease seldom exceeds nineteen or twenty-one years. Notwithstanding this, most certainly the farmers in that country have, of late years, much exceeded the improvement

* See a beautiful explanation of this, in an address of Mr. George Dempster, to the Society for encouraging the fisheries, and establishing villages in the Western Isles and coasts of Scotland, published in the year 1789.

of the same class in this island. But I am afraid, that this improvement will not be progressive without some alteration of the law of the land, in favour of that deserving class of the community. I am perfectly of opinion on the other hand, that the improvement of the circumstances of the farmers and of the system of farming in Ireland, will be rapid and important.

To endeavour to reconcile men to their situation, by shewing them that their neighbours are in a worse situation than themselves; and to excite them to exertion and emulation, from that circumstance, is certainly what Lord Bacon calls, the *argumentum ad forum*, or the argument at the market. But when in these modern times it is happily become the fashion, for noble Lords to harangue on agriculture, literally at the market in England, I hope I may be excused in exhibiting to the Irish farmer the advantages he enjoys by a full participation of the English constitution. Nor have I any apprehension of exciting either jealousy or discontent, by exhibiting my former country as the less favoured of the two by the British constitution. The men of that country know too well how to obey the laws, by which they are protected, ever to oppose them. By practising obedience like the Persians of old, they know also how to deserve those favours, which violence and discontent, never can command.

It is not on the tenantry alone, however, that we can depend for the first beginnings of improvement, in this or any other country. We hope, that the enlightened resident proprietor will shew the example,

and the non-resident, at least, encourage the spirit of improvements so highly for the interests of both to be made universal. The period of ferocious ignorance*, we truly trust, is no more. We hope never to hear it repeated, that the possessors of princely domains only identify their interests with Ireland, by the regularity of the receipt of their rents. From the English non-resident, Ireland should naturally expect, at least, the transmission of English improvements, and English example.

Their true interests, and those of all other proprietors, are the same with the interests of the community, that of introducing "*such a mode of husbandry, as will lead the land to be improved in perpetuity, instead of such improvements as the interest of the tenant leads to be only temporary.*"

"Instead of an absentee tax, which has always been a favourite object in Ireland, it would be, perhaps, a much wiser policy to exempt the proprietors of large estates from certain taxes, on condition of their improving a certain portion of the land at their own expence†."

It is therefore earnestly to be hoped, that the legislature, and the proprietor, will join hand in hand, in bringing forward every encouragement, and making use of every exertion, to make it the *interest* of the farmer, to adopt those improvements, which, in the end, cannot fail of enriching himself; while by those means, by which he is rising to wealth and independence,

* See the Appendix to Mr. Young's valuable Tour in Ireland, wrote twenty-five years ago.

† See the Inquiry into the Wealth of Nations.

dence, he is at the same time occasioning a permanent addition to the strength and wealth of the kingdom; instead of, by pernicious deterioration of the soil, heaping wretchedness on himself, and destruction on his country.

The great principle to be adhered to, is constantly to restore to the soil, what is taken from it.

Those earths, and the carbonaceous principle, the due admixture of which form the basis of fertility in land, suffer a diminution by vegetation, and by entering more or less into the constitution of different plants; of these the carbonaceous principle, which is the most important, enters most into the constitution of plants, and is only to be restored in a quantity proportionate to that taken away, by returning the plant to the soil in a state of dissolution. Nature performs this operation by the gradual dissolution, which takes place after the business of vegetation and reproduction is finished. This is more speedily performed by art, in hastening that dissolution by putrefactive fermentation, and corruption. Still more effectually is this performed, by the produce of the land being made to pass through the bowels of animals, by consuming it either on the land, or, if carried off to be consumed, restoring in the state of dung, the full quantity thus taken from the soil.

To effect this necessary and indispensable purpose, that period of the agricultural year, in which nature rests, from exerting the powers of vegetation, ought to be the period of the greatest activity, in the annual round of labour.

In this season, too often passed in slothful indolence, the means of assisting the efforts of nature in the opening spring, are to be collected and prepared.

Never for a moment, at any period, should the assiduous husbandman lose sight of his golden rule, TO GROW WINTER PROVISION ADEQUATE TO THE SUPPORT OF SUCH A STOCK OF CATTLE, AS WITH THEIR DUNG WILL KEEP THE FARM IN CONSTANT HEART.

This is the *first* point in all good husbandry. This is the *second*, and this still the *third*. This obligation is well deserving of being engraven on all leaves, inculcated to the old, and impressed on the young. In one sentence, it contains all, that is superlatively excellent in the practice of agriculture.

As the principal foundation of this husbandry, and, indeed, the basis of all good husbandry, I would earnestly recommend the introduction of GREEN CROPS and ROOT CROPS. Of all species of the former, I hold tares to be the most profitable. It is only of late years, that the cultivation of tares has been properly understood, but it is rapidly extending itself in England. To Mr. Crook, of Tytherton, near Chippenham I am indebted, for my first knowledge of the advantage of this crop, and who first introduced them to the farmers in the west of England. Mr. Middleton in his agricultural report of Middlesex, states that he was the first in England, who sowed them on a large scale, and publicly recommended them to the notice of farmers, as highly deserving to be introduced into a regular rotation of crops, for which communication he was honoured by the Society of Arts with a medal, and by the thanks of the Board of Agriculture.

TARES.

As this is the first opportunity I have had of recommending this crop publicly to the farmers in Ireland; I cannot possibly do it in more forcible language than in the words of that very intelligent and able agriculturist.

“ After several years more experience of their utility, it is impossible for me to say so much in their favour as they deserve. They may be the principal means of enabling the arable farmer to support as much live stock as the grazier. For during the time they occupy the ground, they produce more green food of the best quality, per acre, than Romney marsh, or Pevensey level; and the ground may be cleared of them in the month of June, in such good time, as to admit of loamy sands producing a crop of clean turnips, in the same year, and of clayey loams being prepared and sown with wheat. They support cattle, will make both sheep and bullocks of every size and breed fat; they suit every situation, and will flourish on all the variety of soils in this country; from the gravel hills near Dartford, in Kent, to the stiff yellow clays in the wealds of Suffex. They do not depend on any particular market, and above all, they manure the land fit for the immediate reception of turnips; whereby a succession of green crops can be kept up, that would fat a very increased quantity of live stock, and be the means of raising, in situations the most distant from towns, an abundance of those great sources of fertility, dung and urine. A judicious combination of tares with turnips, clover, and sainfoin, may be the means of rendering our poor sheep-walks, downs and wastes, of from ten to thirty times their present value to the community.

PREPARATION.

1. PREPARATION.

“ If the land be poor, or at least not rich, manure it, otherwise not; plough it thinly, into ridges, well calculated to keep it dry; sow broad cast, and harrow in the seed.”

2. SORT.

“ There are two sorts; the winter tare, and the spring tare. The former is the most sown, and is sufficiently hardy, to stand all the changes of the weather, even the severest degree of frost, ever experienced in England, or, I believe in Great Britain*.”

3. STEEP.

“ None used. Although for sowing in very dry seasons, it would be adviseable to steep the seed.”

4. SEED, (*quantity sown.*)

“ In the middle of the season, about two bushels and a half on soils moderately rich, (that is, four bushels

* Those sown in August 1794, stood the long and severe frost of the following winter, perfectly well in Surrey.

bushels to the Irish acre) but early sowing, and rich soils, require less seed than poor soils and late sowing. Many persons sow a little rye with winter tares, and some intelligent men sow a small quantity of barley among spring tares.

5. TIME OF SOWING.

“From the middle of August to the middle of October. If the land be poor, or the situation exposed, by all means sow early, even in August, and in all cases it is adviseable to sow at different periods; early, medium, and late, in order to have a succession of them for seed the ensuing spring.”

6. CULTURE.

“A light roller should be drawn over them, during the first dry time in March, to prepare the ground for the scythe; and the most rank weeds should be drawn by hand in April.”

7. HARVESTING.

They begin to blossom in May, and from that time, I am of opinion, the farmer's stock should be wholly supported

supported by them till the blossom begin to fall off, and the formation of the pods to take place; at which time all, that are left, should be made into hay, unless pods should appear in large quantities, and supposing them to be of the true winter sort. The farmer should, in that case, reserve feed enough for his own use; otherwise he should make them all into hay. If the land has been dunged, and the feed good, there will probably be a crop of twelve tons of green tares, or three tons of hay, and provided they are well cured, it will be the best hay on the farm. But tares require a considerable degree of sun. Rain is very injurious to them. In case a continuance of wet weather should happen after they are cut, it would be difficult to make them into hay at all, at least of a good and salutary quality. On account of this risk, I would recommend, that all the stock of a farm should be foiled on them green, and in doing so, it will necessarily have the good effect of taking the stock off the grass land, long enough to allow its being mown for hay. By this means, the farmer's meadow hay will be much increased in quantity; he will not have occasion for pasture, (the tares abundantly supplying the place of the richest pasturage) and by the time that the cattle return from green tares, the grass land, in the mean time having been mown, will be ready to receive them. I conceive that I may justly be allowed to estimate the value of tares, as if they were all made into hay, as this will be the case with a great part of them. The rest will preserve an additional quantity of meadow hay, perhaps equal to their own weight.

Spring

Spring tares produce rather a lighter crop, and are subject to much risk from a dry summer. There is no difference in their application, or value per ton; but the spring sort coming a fortnight later, it seems to be convenient and adviseable to grow some of each sort, and to have a succession of them for green food all the summer.

As to the manner of giving them to cattle, it would be wasteful in the extreme, to turn live stock into a field of tares, as their treading and lying down would do great mischief to the crop, even by feeding it in small patches hurdled of. The most adviseable method would be, to mow the tares of the first half acre, and to carry the produce to the stables, cow-houses, and fold yards; or on poor land to be consumed by stock. Then to hurdle the growing tares from such cleared ground, into which put the stock, and feed them all with the tares given them in racks, removing the hurdles and the racks forward daily, to the edge of the growing tares, which will manure the land uniformly, and deposit all the urine in the soil. Or a very good method is, to feed them through rack hurdles, which are made the same as the common five railed ones, only leaving the middle rail out, and nailing upright pieces across at proper distances, to admit the sheep to put their heads through. A swath of vetches being mown, in the direction you wish to plough the land, a sufficient number of these hurdles, allowing one to five sheep, are set close to it; at noon, the shepperd mows another swath, and throws it to the hurdles, and the same at night; next morning a swath

swath being first mown, the hurdles are again set; thus mowing them once in the twenty-four hours, by this trifling additional trouble, the vetches are eaten clean off, and the land equally benefited.—*Gloucester Report, 4to, p. 17.*

8. THRESHING.

“ The seed thrashes out very readily by the flail.

9. PRODUCE.

“ I have weighed a sufficient quantity of tares to know, that the produce was twelve tons per acre; when made into hay, it was three tons, which, in this county, is worth from twelve to fifteen guineas, per acre. The seed will sell from five shillings to twenty-one shillings per bushel. A neighbour of mine, who grew tares, on my recommendation, permitted one field to stand for seed; it produced upwards of 40 bushels per acre.”

10. APPROPRIATION.

“ Pidgeons prefer tares to all other food.”

As a full proof that tares will answer well in this island, and in this county, Mrs. Tighe sowed them last year in a field, which was perfectly worn out, ploughed in a very middling way, and without any manure. They were also sown very late, as she found some difficulty to get the seed, but from having seen the above admirable account of them, was desirous of introducing them into the county. They were, therefore, rather late in coming into blossom, which was about the middle of June. I was then at Rosanna, and she was so good as to have a sufficient quantity cut and weighed, by which we found there were seventeen tons and an half to the Irish acre, which amounts to ten ton eighteen hundred to the English acre, or very near eleven tons. Had they been sown early, there is no doubt, the produce would have been fully equal to what Mr. Middleton states, of the produce on his farm, viz. twelve tons to an acre.

I have thought it necessary to be thus particular, respecting this valuable crop, because the farmers in no part of this island, in which I have been, are at all acquainted with its excellence, and even in England, its introduction, in the rotation of crops, is only within these few years. Great as the advantage is, of this crop taken singly, its principal importance in a course of husbandry is, that it is taken off the ground in time sufficient for the sowing of turnips, by which means *two green crops* can be produced in the same land in one year, both of which may be fed with cattle. Here, then, is a most invaluable resource to the Irish farmer,

farmer, for recruiting his worn out, exhausted land, instead of the miserable system of turning the land out to rest.

I earnestly hope the Society will pay particular attention to this important object, and offer such premiums for the growth of *two green crops to be fed with cattle in one year*, as will induce this system to be generally followed.

It will not, therefore, be considered, it is hoped, contrary to the design of this Report, to state what I have collected from observation and experience, with regard to the culture of a plant, which is considered justly as the basis of the best husbandry in every part of Great Britain, to which I shall add such extracts from the reports of the Board of Agriculture, as may lead to the future improvement of this kind of husbandry.

TURNIPS*.

“ They support and make fat, a very increased quantity of animal food, and by *the dung and urine of fat*

* At Powerscourt, on a light sandy soil, turnips have been found to grow so luxuriously, that five roots weighed 120lb. They also grow very well on drained black peat earth, and as a first crop on the breaking up strong loames. In the county of Devon, they are always a first crop after paring and burning, or what is called burnbeating and densheering. In the county of Wicklow, near the gold mine, they are now coming into general use as a first crop, on breaking up old ley, previously fallowed and limed.

fat cattle, the land becomes more highly enriched than by any other means. It is an advantage of great importance, that they require such late sowing, as to give the farmer an opportunity of reaping *two green crops* on the same land in one year, both of which may be fed by cattle. A succession of these crops (tares and turnips) may be raised and consumed on dry land, till it acquires any desired degree of richness, and will feed more bullocks and sheep than the best grass in the kingdom*, and, what is of great consequence, it will be perfectly clean, and fit for any sort of corn during the whole time.”

As mentioned in the foregoing note, the practice of growing turnips in the southern part of the county of Wicklow, has of late years, become very general in the mountains near the gold mines. The farmers complained to me, of the difficulty they found in getting good feed. They have not yet arrived at the proper mode of raising their own seed. They sow them entirely broadcast, nor have the least idea of hoeing them afterwards.

In the county of Devon, they also sow their turnips broadcast. In the year 1793, when examining into the agriculture of that county, in order to make a Report to the Board of Agriculture, I prevailed on a farmer to sow part of a field he was then preparing

for

* Romney marsh feeds five or six sheep per acre, per annum. An acre of loamy sand, only moderately rich, cropped with tares in the spring, and turnips in the autumn, will fatten twenty of the same sheep.—See *Hertfordshire Report*, 410, page 204.

for turnips, with Mr. Cooke's drill, which I borrowed from a gentleman, who happened to have one of them. The drilled part even without hoeing, was so superior in produce to the rest of the field, that the farmer himself acknowledged, that his field of turnips had it been all drilled, would have been better by thirty pounds sterling.

It is, however, of great importance to remark, that the broadcast method will answer very well, if the turnips are afterwards properly hoed, and set at proper distance from each other. Mr. Middleton states, that in the county of Middlesex, the broadcast method of sowing turnips is the only one made use of. They are invariably twice hoed by hand.

Mr. Treby, the President of the South Devon Agricultural Society, assures me, that after every attention to this subject, the Society do not think fit to recommend an alteration from the broadcast method, to the drill culture of turnips; but confine their commendations and premiums to the hoeing of turnips. By this means, and by the annual premiums they bestow, the hoeing of turnips has become general, and the women, by whom it is chiefly performed, very expert.

HOEING.

When the plants spread to a circle of about four inches, they are ready for hoeing. They ought to be left eighteen inches a part. The second hoeing about three weeks after the first, should perfectly clean the crop.

RAISING.

RAISING THE SEED.

Those, who wish to go extensively into the turnip husbandry, and, indeed, all in the county of Wicklow, from the difficulty of procuring seed, ought to raise their own seed.

For this purpose, the finest roots must be chosen, and transplanted into a place prepared for them. It is wonderful, what a small quantity of seed is sufficient for an acre of ground, and how it can be spread over such a breadth. A pint might be more than sufficient, but it is usual to broadcast a quart on an English acre. In saving the seed, much depends on the weather being fortunately good. It is necessary to be particularly careful *to gather the seed when the sun shines*. It is commonly, like rape, threshed abroad. Care should be taken both in cutting and moving the haulm, otherwise much of the seed will be dashed out on the land. The same caution should be applied to rape, to the management of which the farmers in many parts of the island are already accustomed.

PREPARATION.

Mr. Middleton states, that in the county of Middlesex there is no such thing as turnip fallow; the land invariably produces a crop in the spring, before the preparation for turnips, generally tares, early pease

or rye. As soon as the preceding crop is off, the land is ploughed very thin, then harrowed, and the weeds, stubble, &c. raked into heaps, and burnt. It is then cross-ploughed, a full depth, harrowed, and the weeds raked and burnt as before, and lastly, it is ploughed into ridges of four or five yards wide, harrowed, then sown broadcast, and the seed covered by another harrowing.

In the county of Wicklow, on land in tillage, the mode, that ought to be pursued, is plain and simple. Immediately after the crop, whether wheat, barley, or oats, is off the ground, plough up the stubble, sow in all the marled lands tares, according to the directions already given; feeding them off in the way already prescribed. In the mountain lands, if tares cannot be got, sow rye and feed it off with sheep, after which, follow the method of preparing for turnips, just now given, manuring the ground with either dung or lime.

On land not in tillage but ley, the mode in the county of Devon might, on many occasions, be followed with advantage. Before Christmas they plough three or four furrows around the edge of the field; early next summer they pare the field, either with the spade or with a plough, the share of which is about four inches broad, having the winged side turned up, so as to cut the soil in parings four inches broad, the paring is about two inches deep. It is then cross-ploughed the full depth, dragged and harrowed very well, the sods and weeds then gathered in heaps and burnt. To the burnt ashes are added, of lime about

one hundred and fifty bushels, nearly forty barrels to the English statute acre, which is in the proportion of sixty barrels to the Irish plantation acre. To this quantity of lime, and to the ashes, is added about four or five times the quantity of earth, from the edges of the field, ploughed as before mentioned. The ashes, lime, and earth, are then spread abroad; the field is then ploughed, and laid out into ridges. The seed covered in, (being broadcast) by another harrowing.

Mr. Exter, near Barnstaple, in the North of Devon, differs completely from the general practice of the county, in preferring the drilling of turnips to sowing them broadcast.

In the autumn of the year 1796, I had the pleasure of examining with great attention Mr. Exter's farm, on the bare inspection of which, the drilled turnips were evidently superior to the broadcast.

On this farm he had wheat and barley, both drilled and broadcast, in the same field, so that there could not be any difference of soil. I saw afterwards the produce off both threshed and measured.

The drilled part with one half of the seed, was greatly superior in produce to the broadcast, but what is of infinite consequence, neither the wheat, nor the barley *were in the least lodged in that part, of the field, which was drilled, whereas in that part which was broadcast, the corn was both lodged, and much stained.* This very season that I mention, Mr. Young had seen Mr. Exter's farm, and although he had always been against the drilling system, he frankly acknowledged to Mr. Exter, the superiority of the drill culture from what he saw on his farm.

The only obstacle to the general introduction of the drill husbandry is, the difficulty of obtaining, and the high price of the machines, for that purpose. But with regard to turnips they might be drilled with advantage, even by the common mode the farmers in this county are accustomed to, with regard to drilling potatoes. Let them only lay out the drills eighteen inches asunder, and rill the seed with the hand the same way as gardeners are accustomed to do. I have known this done in Scotland very well by girls; the seed being put into a half pint phial, and rilling it in the drills, previously marked by a light plough. This practice I have also seen this year followed by Mr. Grierson, near Rathfarnham, with an improvement, by inserting a quill through the cork of the phial.

Sort.—Steep.—Quantity of Seed.

The large round turnip produces the greatest bulk, frequently extending to twenty-five pounds, and three feet three inches in circumference. The yellow turnip, however, is supposed to contain the most nutriment. I find it lasts longest in the spring, without being sticky. In China, Sir George Staunton says, they steep all their feeds, and particularly turnips, in liquid manure, until they begin to germinate, and by this means they are never attacked by the fly. It is not common in England to steep them. But some advise it to be done in a very dry season. Perhaps,
steeping

steeping them first, and afterwards mixing with them a quantity of the Hepar-sulphuris, would prevent them being attacked by the fly. A gentleman near Star-cross, in Devon, assured me, that he had constantly prevented his turnips being hurt by the fly, by rolling the seed in a mixture of soot and the flower of sulphur, previous to its being sown.

The quantity of seed is about two pounds to an English acre, without steeping; that is, a *little* more than three pounds to the *Irish* acre.

Time of Sowing.

They are sown as early in the months of July and August, as the ground can be got ready. The first sown produces the largest crops, and should be first eaten; the last sown will stand the frost better.

Mr. Middleton strongly recommends the plan of sowing turnips on one bout ridges, as practised in the South of Scotland, and the North of England. He adds, “ Mr. Mure’s drilling plough, with two mould boards, at once going forms the ridge, with the dung in the centre of it, makes a drill, sows the seed, and covers it. The plants being reduced to proper distances, with a short hoe, a man and an old horse with the same plough may hoe four acres a day, pare the sides and bottoms of the furrows, mix the soil, lay it up to the plants, and leave not a weed to be seen. Turnips so grown exceed in weight, per acre, the

broadcast method, fifty per cent.—See a plate and description in the *Annals of Agriculture*, vol. ix. p. 432, to 443.—This method, Mr. Middleton says, is equally applicable to beans, cabbages, potatoes, and, perhaps, carrots, parsnips, peas, and tares*.

To Preserve Turnips.

In the North of Scotland, to save turnips from the frost, they are accustomed to take them up before Christmas, and taking the top and tail off, they stack them in a waste house.

Mr. Varlo gives the following mode of preserving them. “One load of any kind of dry straw suffices to stack an acre of turnips of fifty tons. Draw the turnips, top and tail them, throw them in a wind-row, and let them lie a few days to dry. First place a layer of straw next the ground, and upon it a layer of turnips, about half a yard thick, then another layer of straw, and so on alternately, every layer being made narrower, until it come to a point or sugar-loaf top†.

“ The

* I would earnestly recommend it to the Dublin Society, to get a number of these useful machines made, and give them as premiums to the farmers, or sell them at a low price.

† The same mode as is used in pitting potatoes in this country, would do very well, covering them with straw, and then earth.

“The last layer must be straw, which serves to keep all dry. Observe at every layer of turnips to stroke or lap up the ends of the under layer of straw over them in order to keep them close, and from tumbling out. The heap should be as large as a hay cock.”

The following account of two crops of drilled turnips is interesting in the highest degree. Two adjoining fields were taken at Lady-day, from a little farmer, in a very foul and impoverished state, and well pulverised and cleansed, by frequent scarifying, rolling and harrowing. The quitch grass was drawn out by the quitch rake, and burned on the land. After these operations, which, cleansed, levelled, and pulverized the land about six inches and a half deep, one field of four acres was thrown into ridges by one bout of the plough, three feet from the centre of one ridge to the centre of the other. A triangular sled of wood, drawn by one horse, and held by a boy, was passed at the bottom of each furrow, to make them about two feet wide, which operation was necessary, merely to widen the bottoms of the furrows, that the rows of plants might be exactly over the manure. In these furrows some long wet straw from the farm yard half rotted was laid, about ten common carts per acre*; the ridges were then split and reversed, throwing all the pulverized soil on the dung; one horse and a boy, with a long bar of wood with handles,

* Forty-eight car-loads to the Irish acre.

dles, beat down the tops of the ridges at once, leaving a surface of about eighteen inches wide, and prepared the land for drilling. The horses then walked in one furrow; each wheel occupied another; and four rows of turnips were drilled on the tops of two ridges; eleven inches and an half from row to row on each ridge, and twenty-two inches and an half interval. As soon as the turnips were in the rough leaf, the corn scarificators were passed through them, a furrow was taken from each side of the ridge, with the common Suffolk plough, and the turnips in the rows were hand hoed. These operations were performed twice, and the whole land thrown up to the turnips by the common plough, which finished. The field was sowed in the first and second weeks of July. Before Michaelmas, no appearance of intervals could be seen, and the whole field exhibited the finest and most regular crop of turnips ever beheld. Many of them weighed 25lb each, and measured three feet three inches in circumference. Agriculturists and farmers from many parts of the country, visited the farm, and were astonished at the regularity of the crop, and the size of the plants. The average weight of each turnip was about twelve or fourteen pounds. The acreable weight was ascertained by weighing a few rods, to amount to fifty-five tons. The turnips were most of them drawn, their tops and tails cut off, and stacked before the frosts, and are now, this FIFTH day of MARCH, perfectly sound and good. Never did bullocks fat quicker than on those turnips. *They were lean, working beasts, put up in the beginning of November*

ember, and will soon be very fat, as they already weigh about forty-five score each, and it is supposed they will reach fifty score each, by the middle of April.

“ The other four acres were treated exactly like these, except being sown without any dung, and ten days later than the first field; yet to shew what extra tillage, and throwing the *whole of the soil* to the plants will effect, these were a very even and beautiful crop of turnips, allowed to be the best in the country, except the adjoining field, and a neighbouring one, tilled in the same method. The advantage of this system must be apparent; the young plants, when the land is mucked, are absolutely on a hot-bed, and grow so rapidly that they are in little or no danger from the fly. The intervals admit sun and air, without loss of land, as the whole of the pulverized soil is thrown to the part of the land occupied by the plants. The land is better tilled by the use of the horse-hoe, and common plough, than it can possibly be by hand-hoeing, and the expence of hand-hoeing is reduced one half, by having merely to hoe the rows of turnips, and to single the plants*. Thus, a complete fallow is made, and a much heavier crop obtained, at about one quarter of the expence of ploughing four times, dragging, &c. as in the common system. But great success must not be expected, without first obtaining the most compleat pulverization†.”

As

* The plants ought to be at least a foot asunder; they are, however, generally left at eight or nine inches distance.

† Bath papers communicated by the Rev. Mr. Close.

As the introduction of the turnip husbandry into this county, and into all the mountainous parts of Ireland, is the most valuable improvement, that can possibly be brought about, both for the improvement of land, and for feeding sheep and cattle, it will not, it is hoped, be deemed contrary to the intention of this work, to enter still more particularly into the mode of cultivating turnips in the North of England and the South of Scotland.*

But what speaks for itself is, that the introducing turnips, or turnips after tares, will put an end to the necessity of turning the land out to rest, or of making use of fallowing.

The objection made to turnips by many is, that they would be stolen. I remember the same objection made twenty years ago in the Northern part of Scotland. At first, indeed, a few were stolen, but when they became general, they were no more stolen than potatoes or any other produce. This would also be the case in Ireland. I remember a gentleman, who was anxious to introduce the drill culture of turnips, who always sowed a ridge or two broadcast, at the edge of the field, and put up a label, with the following inscription, "*Be pleased to steal out of this spot.*"

Ingenious

* "I certainly think the introduction of the Cheviot breed of sheep, and the Roxboroughshire mode of cultivating turnips, are the two most valuable improvements, that can possibly be introduced into the mountainous parts of Ireland. Letter from Sir John Sinclair, dated 24th of April, 1801, addressed to the Author."

Ingenious Mode of teaching to hoe Turnips.

“On Tweedside, in Roxboroughshire, Northumberland, Cumberland, and Westmoreland, they formerly sowed their turnips broadcast, as they still do in the South and West of England. They were hoed by gardeners and other men at an extravagant price. About thirty years ago, the ingenious Mr. Ilderton had the merit of reducing the price of hoeing, by teaching boys, girls, and women, to perform the work equally as well, if not better than men. The mode he took was simple and ingenious. By a light plough, without a mould-board, he divided the field into small squares of equal magnitude, and directed the boys and girls to leave a certain number of plants in each square. In a short time they became accurate, regular, and expert hoers, and in a few years all the turnips of the country were hoed by women and boys, at half the expence, and better than by men.”

“The present mode of drilling turnips was first introduced into this county, Northumberland, about the year 1780; the advantages, with which it is attended, have so far recommended the practice, that very few are now sown broadcast*, and as we think it is an operation, that may be serviceable in other districts, we shall be more particular in describing the manner of performing it*.

“The

* The broadcast culture of turnips in the Northern parts of this county, for many years previous to this, was not inferior to any we ever saw, and in respect to accurate, regular and clean hoeing, superior to what we observed in *Norfolk*, *Suffolk*, or other turnip districts, which we have frequently examined.—*Culley's Agricultural Survey of Northumberland.*

“ The land being made fine, prepared, &c. as in the broadcast method, the ploughman draws his first furrow as straight as possible. In returning he keeps his far side horse in the new made furrow, and his plough at such a distance as to form a one bout ridge like



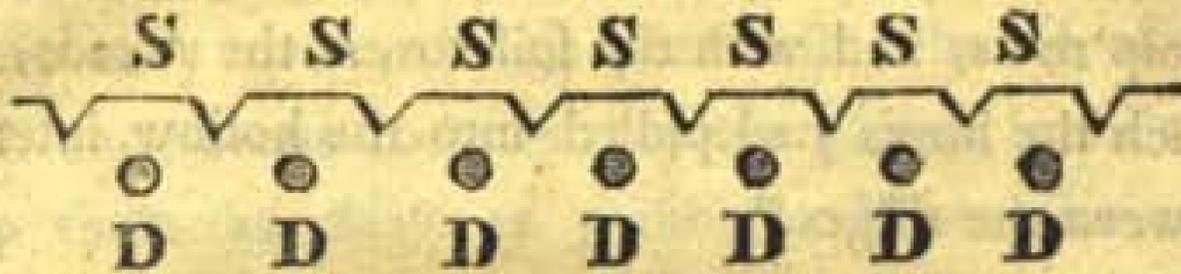
By proceeding in this manner, the land, when finished, will appear thus:



The distance of these little ridges is from 27 to thirty inches. A less distance does not admit of ploughing between the drills.

“ The next operation is spreading the dung, which is performed by a cart going down every third or fifth furrow, and laying the dung in small heaps; women and boys follow with small three pronged forks, and spread it evenly in the bottom of three or five furrows, that is, the one where the dung is dropped from the cart, and those on each side of it; this done, the ploughman splits the one bout ridges before raised, and covers up the dung exactly in the middle; but before the seed can be sown, these last formed one bout ridges require to be flattened at the top by a small roller, that flattens two ridges at once. Upon the top, and exactly in the middle of these flattened ridges, the seed is deposited by one or two drill machines, tied to the roller by a rope, six or seven feet long,

long, at which distance they follow the roller, each machine being guided by a man. When finished, the work appears in this form :



Where S represents the feed and D the dung, directly under it, which is fully employed in promoting the vegetation of the turnips.

“ The roller is drawn by one horse, driven by a boy ; setting up the ridges and covering the dung is performed by a common swing plough. The quantity of feed sown, from one to two pounds per acre ; it being better to have abundance of plants for fear of accidents. The quantity of dung used is from ten to fifteen two horse cart loads* per acre.

“ When the plants have four leaves we begin to hoe, and as they have so much room sideways, we leave them only eight or nine inches from one another in the rows or drills. The hoers go sideways, and pull the surplus plants, weeds, &c. into the hollow intervals between the one bout ridges, and the turnips are left as regular as if they were planted. This work is performed by women and children with the greatest exactness, at the expence of 4s. per acre.

“ As

* I take a two horse cart load to be equal to three car-loads, which would therefore be from 48 to 70 car-loads of dung to an acre. A very small quantity for so important a crop! 160 car-loads are required for an acre of drilled potatoes.

“ As soon as the plants are recovered, which will be in about eight or ten days, a small plough five inches wide at the bottom behind, and eleven inches at top, drawn by one horse, takes the earth from the turnip rows, and with the foil covers the weeds, &c. which the hoers had pulled into the hollow intervals between the ridges.”

A second hoeing takes place when the plants are strong enough, and otherwise necessary; and a few days after, the foil or earth, before ploughed from the turnip rows into the hollow intervals, is now divided equally, and laid up to each drill or ridge again, by the same small plough and one horse, or with a double mould-board plow. This finishes the business, unless the land has been very wild, and out of condition, and requires more hoeing and ploughing between the drills.

“ It is generally supposed, that a weightier crop is produced by the drill, than by the broadcast method; but even admitting them equal in this respect, the superiority as a fallow crop must be allowed to the drill; for the repeated ploughings in the intervals, and hand hoeings in the rows, effectually extirpate the whole race of annual weeds, and so much surface being exposed through winter, makes a higher preparation for any succeeding crop. Another advantage is, the facility with which they are hoed, as a boy or girl nine or ten years old can hoe them with the greatest ease, and generally better than experienced broadcast hoers, who are apt to take too many plants away, while the thin ones, from the apprehension of leaving them to their will, leave them at any distance you shew them.

“ *The*

“ *The application* of turnips in this county of Northumberland, is mostly to feeding and rearing cattle and sheep, and some small quantity for raising seed.

“ *When used for cattle* they are always led off from where they grow, being previously cleared of the earth and fibrous roots as they are pulled, in order to keep them as clean as possible. When the cattle are tied up in sheds, which we think much better than being out in the fields, they are foddered with turnips 8 or 9 times a day, and with straw or hay twice; great attention ought to be paid to keeping their cribs clean.

“ When the convenience of sheds cannot be had, they are given to the cattle in a dry grass field, scattered as thin as circumstances will admit; a crib with straw in it should be constantly in the field, for the cattle to serve themselves when they chuse.

“ *For sheep*, they are sometimes eaten upon the ground, where they grow, particularly if a dry, light, sandy soil, but more generally led off into an adjoining field, which we think a much better and more economical practice; the sheep getting a daily regular supply of fresh food, *and the shells being kept clean, are eaten by young cattle*, or those, that are to be fattened next summer upon grass. Some times every other ridge is led off, and the remainder eaten upon the ground where they grow; when eaten upon the ground, the sheep are not turned upon the whole at once, but have it portioned out to them by hurdles or nets; so that they may have a fresh break once a week or ten days.

“ *For seed*, the turnips of the best form are selected, and transplanted in the month of October, November,

or December, into a piece of ground properly prepared for them ; in July or August following, it is generally reaped, tied up in sheaves, and when dry, put into a *long stack*, where it is kept through the winter, and threshed out in April or May.

“ The trouble of selecting and transplanting is sometimes dispensed with, but the seed raised in this manner is sold for one half or one-third the price of the transplanted seed ; that is, when the transplanted seed is sold for one shilling per pound, the other is sold for *4d.* or *6d.*”

“ The produce is very variable, being subject to many casualties. The average crop may be reckoned about twenty bushels, or half a ton per acre. The land should be good and well manured, after letting the turnips stand for feed, as we find the soil much impoverished by it*.”

Having thus given such directions for growing turnips, as we think cannot but be intelligible to every farmer or gentleman who wishes to try the experiment, we cannot conclude this part of our Report without saying a few words respecting

R A P E.

This is not much cultivated at present, in this county, but is a little in some places. Mrs. Tighe and Mr. Henry Tighe, had two fields near the Milltown, of
Rosanna,

* I am happy to pay the compliment to Mr. Culley, of copying his directions for drilling turnips, as it was owing to a pupil of his, Mr. Richmond, that the drill husbandry was first introduced, for that crop in an extensive manner, into a considerable district in Scotland, with which I am connected, and, perhaps, this may have the effect in Ireland of introducing this system.

Rosanna, in rape after being pared and burned, without any other manure than the ashes spread abroad. On both the crop was very luxuriant. I, however, would recommend rape to be drilled on one bout ridges, as I have above described in the culture of turnips.

Rape for spring feeding, is excellent, and does wonders in keeping sheep, filling up that time excellently, between the turnips going out and the clover coming in.

There are many doubts respecting the effect it has in ameliorating or injuring the soil, in being allowed to remain for feeding, but there can be doubt of its ameliorating effects, if fed off by sheep.

RAPE will do best, however, by being *transplanted* on the one bout ridges instead of drilled; one rood will produce plants sufficient for ten acres. By being thus sown on a rich soil the plants will be strong, and if planted out, and earthed and hoed, it will answer every purpose of a fallow.

Turnips may also be transplanted, and I am inclined to think, it would be by far the best way of managing them, and do better than the drill.

I have frequently remarked, that turnips, being torn from their roots by the hoe in hoeing broadcast, and just settled again, produce the largest bulbor root, instead as one would apprehend being injured by being thus loosened or removed.

The great advantage of transplanted wheat is well understood. Mr. Henry Tighe made an experiment of it this year, by which it appeared, that the additional
labour

labour was amply repaid by the additional produce. It is also known, that beans and pease thrive wonderfully by being transplanted. The tearing the small fibres of the roots has an effect similar to the nipping of the top of the plant, as they are coming into flower; a custom often practised, with regard to beans, by gardeners.

SECT. 3. *Use of Oxen—How harnessed.*

IN this county oxen are a good deal used, sometimes in a team of themselves, and of tener with horses. They are generally harnessed like horses, but with a large straw collar, which ought, however, to be kept dry, otherwise it will be apt to chaff them.

With regard to the general question of the preference of HORSES or OXEN for *slow draft*, it has often discussed.

Mr. Middleton, Mr. Billingsley, and Mr. Culley are decidedly of opinion, that horses are more advantageous to the farmer than oxen, for draft.

Mr. Culley goes very far, and exhibits a statement well supported, from which it appears, that if oxen were universally used for the draft, in the room of horses, there would be a considerable defalcation in the supply of the markets, both in corn and animal food.

This conclusion arises from the calculation, that two horses will do as much work as six oxen.

Whether

Whether it is the case that horses are to be preferred to oxen on large farms, and where the horses are well trained and fed, I would not argue against names of so much authority. But I am well persuaded, that all the farming business, both in Great Britain and Ireland, could be done by oxen with equal advantage, at least, as with horses. And in Ireland I am certain, that good stout oxen will do work equal to the poor half fed miserable horses, of the common Irish farmer. The stock thereby added to the market of flesh meat would be so considerable as to deserve great attention, and on all farms of a middling size, it will be found a material saving.

However, in many parts of this county, on account of the length they have to carry their lime and coals, turf, &c. some horses will always be found necessary. The formation of canals for agricultural purposes, of which we shall say more in the sequel of this work, will diminish that necessity of keeping horses for long carriage.

In England, the most experienced farmers have assured me, particularly Mr. Crook, of Tytherton, that the best North Devon cattle excel all others in point of draft and quickness of pace. They might easily be got to this county from Ilfracombe or Biddeford, and would be a great acquisition to the stock of this island.

N

PART

N. B. For the remaining part of this Chapter, on the implements of husbandry, &c. see the end of this Part.

PART III.

CHAPTER II.

PASTURE.

SECTION I.

Nature of it.

IN every part of Ireland the tendency to grafs is uncommonly great, fo much fo, that the Green Island is the characteristic name of Ireland.

In this county, like other parts of the Island, they trust fo much to the natural difpofition of the foil to produce grafs, that they are at no pains to improve it. The inclofed pasture is chiefly the natural grafs, arifing on worn out arable fields, on which, according to their expreffion, they have left it to God Almighty to fow the feeds; fome meadows there are, which have never been ploughed.

In the Eastern fide of the county, particularly in the diftrict near the fea fhore, the pasture is, notwithstanding this neglect, extremely luxuriant, and many
cattle

cattle are made fat on this pasture. On the banks of the Liffey and Slaney in the West, there are also many meadows of excellent pasture. The pasture in the uplands and mountains is uncommonly good, and even in those parts of the mountains, where they abound in turf bogs, there are many dry spots abounding in grass. The *anthoxanthum odoratum* is peculiarly abundant. The *iuncus maritimus*, the *briza-media*, and *montana*, the *festuca ovina*, and the *festuca elatior*, are found in most parts of the mountains.

The pasture in the mountainous part of this county, and in many other parts of Ireland, would be much improved by pursuing a mode discovered by the Rev. Mr. Cooke, in cultivating some lands in the mountains of Yorkshire, in 1792.

Mr. Cooke had been repeatedly with me in the forest of Dartmore, in Devon, and had entered with great zeal into the plan I had the honour to propose in 1789, to a royal personage, of improving the waste lands in England, and to shew an example by beginning with those in his immediate property, in the county of Devon*.

To a man of Mr. Cooke's habit of investigation and reflexion, the importance most forcibly presented itself, of improving those lands, which, lying at a distance from towns and from lime, must, in a great measure, find the means of improvement in themselves.

* See the Agricultural Report of Devon.

The difficulties of settling the forest of Dartmore, from the poor laws*, rendered it necessary to bring in a bill into Parliament to erect it into a separate parish, as well as to divide and allot the lands subject to rights of common. This bill having failed, Mr. Cooke took an extensive farm in a mountainous part of Yorkshire, where he has for these eight years pursued a series of important experiments in agriculture.

In 1792, Mr. Cooke had the surface of a great part of this land pared with the spade. The sod being by this means turned upside down, and covered with heath and long grass, this heath and grass kept the sod raised a few inches from the ground. Mr. Cooke, when the sod was in this state, and sufficiently dry, set fire to it as it lay on the ground, so that it became burnt with a smothered flame more equally, and the ashes better spread than by making it up in heaps in the usual way. This was done in the month of April, and the land was intended to be ploughed immediately after it was burnt; but this was deferred by other business of the farm, for about a month or six weeks, when, to his astonishment, he discovered better than half a plant of spontaneous grass, where nothing but heath and ling had grown before. Agreeably surprised by this unlooked for circumstance, he suffered

* Ireland being free from the system of poor laws, possesses a great advantage in settling her waste land, of which there are vast tracts, although not common and undivided as in England.

it to remain in the state it was; and the grafs not only thickened very fast, and grew quite green, but being the spontaneous produce of the earth, and not arising from seed, that had been sown, continued permanent. The land, on which this experiment was made, was black peaty earth. He accounted for it from the fire having been thus applied all over the surface, in a state of smothered combustion. Mr. Cooke, from the appearance of the land after this operation, calculated, that an improvement was made, that would afford him a reasonable expectation of the land being worth sixteen shillings an acre.

This is an experiment well deserving of being made in this county, and I have little doubt of its paying well for the expence, whereas the paring and burning, and taking afterwards a few miserable crops of oats, is extremely destructive of vegetation, even although lime is added.

These mountain lands indeed, if laid down to grafs after one crop, might not be injured in so great a degree as materially to destroy their fertility; but I am persuaded even this is bad management, and where the land is capable of being ploughed at all, it is much better to lay it down with two green crops of either tares or rape, and turnips, or turnips alone, and then grafs-seeds. Rye fed off with sheep, especially if mixed with tares, would be a great improvement in the management of mountain farms.

Throughout the mountainous parts of this county, there are a great many vales, and extensive declivities, which, if instead of being racked by repeated miserable
crops,

crops, they were managed in this manner, would be able to afford winter keep for the cattle and sheep, particularly the latter, which could be kept well on the mountains in summer.

SECT. 2. *Breed of Cattle.*

HOW FAR IMPROVED.

IN this county, it is said that some years ago there was a pretty good breed of black cattle, but that they are much degenerated. There certainly cannot be said at present, to be much attention to this object.

SECT. 3. *How far capable of Improvement.*

INSTEAD of attempting to improve the stock I have seen in this county in general, I would be inclined to advise, that they should get entirely into a new breed.

On the borders of this county to the West, adjoining the counties of Dublin and Kildare, I saw some very good cattle belonging to Mr. James Chritchley, and Mr. Bookey. They feed quick and to a large size. Much pains for many years past have been taken in many parts of Ireland, to improve the

the

the breed of cattle by the introduction of the best breeds from England. In the mountainous parts of Ireland, however, as well as in England, the late Mr. Bakewell was of opinion, that the best and most profitable stock was the Highland Scots cattle, and those particularly from the Isle of Sky, where they are in the pure and original state. These cattle are small boned, clean necked, quick feeders, and easily made fat.

These cattle have been of late years introduced into the mountainous parts of Devonshire, where they keep in good heart all winter, without any house meat, at the same time that the native breeds of that county cannot live during winter on the mountains.

There cannot, however, be a doubt, that by selection and attention, the native breeds of this island may be equal to any thing wanted. The point is, to consider what is the object, which are those, that will get fat speedily, with a smaller quantity of food, and then to find a male and female of that breed or quality, and propagate from them without intermixing with any other; by which means you will be sure to retain the same quality. If large size and bone be the object, either from a supposition they will answer best for draft or for the market, select accordingly such as possess that quality, in an eminent degree.

If the object is for milk, the same attention is to be paid.

The Norman, or Holdernefs breed of cattle, are considered by the best cattle breeders in England to be the best milkers. The North Devon the best for draft.

draft. The Highland Scots the best for easily and quickly feeding. These last always sell in the London market for one penny per pound more, on account of the fineness of the grain of the beef, and superior delicacy.

SECT. 4. *Markets and Fairs for Cattle.*

In this county, the metropolis affords a market for the fat cattle, fed in the Northern parts of the county. Those fed in the Southern part of the county, are generally sold to the provision dealers at Ross.

SECT. 5. *General Prices.*

This, of late years, has been so variable, that no average can be easily given. This year, the shutting up of the distilleries has caused a vast additional demand for fat cattle, which has encreased the price beyond the medium of the demand for other articles. The quantity fed at the distilleries are supposed to have amounted to not less than 30,000. It will be happy for the country in many respects, if they should never be again allowed to work; amongst other advantages it would force people to adopt roots and green food in winter, to fat cattle for the supply of the

the market, which has been accustomed to be chiefly supplied from the cattle fed on grains and the refuse of these works.

SECT. 6. *Modes of Feeding*

HOW FAR HOUSED IN WINTER.

This has been answered above, with regard to feeding. They are seldom housed in winter.

SECT. 7. *Natural Grasses.*

In this county there is abundance of all the most valuable natural grasses; amongst many other I found the following.

1. *Anthoxanthum Odoratum*.—Sweet smelling vernal grass; it is to this the hay owes its flavour. This grass is very abundant on all the pastures, even on the mountains.

2. *Poa Pratensis*.—Smooth-stalked meadow grass.

3. *Poa Trivialis*.—Rough-stalked meadow grass; both these I found at Rosanna.

4. *Cynosurus cristatus*.—Crested dog tail.

5. *Briza Media*.—Ladies hair grass.

6. *Aira aquatica*.—Water hair grass.

7. *Poa Maritima*.—Sea meadow grass,

8. *Festuca*

8. *Festuca Ovina*.—Sheeps' fescue grafs.
9. ——— *Fluitans*.—Flote fescue grafs.
10. *Triticum Juncus*.—Sea wheat grafs.
11. *Parnassia-palustris*.—Grafs of parnassus.
12. *Triglochium palustre*.—Arrow headed grafs.
13. *Potentilla repens*.—Five leaved grafs.
14. *Melampyrum Sylvaticum*.—Yellow cow wheat.
15. *Poterium Sanguisorba*.—Burnet.
16. *Alopecurus Pratensis*.—Meadow foxtail.

These and many others grasses and plants I gathered specimens of in this summer, too numerous to be inserted.

SECT. 8. *Artificial Grasses.*

THIS is scarcely, if at all, attended to by the common farmers in this county. Many, even of a higher class, have no idea of any thing but taking as many crops as their land will bear, and turning it out to rest, and some are of opinion, that their land will not bear grafs, and is unfit for the production of it. And certainly laying down with grafs seeds worn out lands full of weeds, is not the way of meeting with success. It is not surprising, if by such management the seeds should not vegetate, or, if they do vegetate, that they are quickly destroyed by the superior luxuriance of weeds and natural grasses.

The first step, therefore, on these worn out lands is, to take two green crops, by which the ground will

will be cleared of weeds, and brought into a proper tilth for the reception of the more profitable grasses. If then the soil is tolerably good, being laid down with oats or barley, and *clover*, mixed or not with ray grass, to be kept under this for two years, one to be mowed, and the second eaten off, the soil will have sufficient strength to bear another crop of barley or wheat, as may be most advantageous. After which, if a perennial lay is wanted, it would be advisable to follow the proportion laid down by Mr. Curtis, who recommends six kinds of grass, to be sowed, and two of clover; the seeds to be mixed together in the following proportion. Meadow foxtail, *alopecurus pratensis*, one pint; meadow fescue, *festuca pratensis*, one pint; smooth-stalked meadow grass, *poa pratensis*, half a pint; rough-stalked meadow grass, *poa trivialis*, half a pint; sweet scented vernal grass, *anthoxanthum odoratum*, a quarter of a pint; Dutch clover, *trifolium repens*, half a pint; red clover, *trifolium pratense*, half a pint; these are to be mixed together, and about three bushels to be sown on an acre in rows, for the convenience of hoeing them. About the end of August or beginning of September, they should be carefully weeded, and thinned, and rolled in spring, to press down into the ground such roots as may have been raised by the frost.

Not only new sown grasses designed for meadows, but the larger grasses, which have the names of corn, as wheat, oats, barley, may be advantageously rolled, when dry, after frost, which, by expanding the water in moist soils, lessens the cavities, which are
occupied

occupied by roots, and thereby prevents their being pushed upwards out of the ground, as may be seen often after frosty nights.

In order, therefore, to make good meadow, it is necessary, that every farmer should be well skilled in the natural grasses, which, in this country, is easily done, as any gentleman or farmer can, on application at the Society's Botanic Garden at Glasnevin, see all the different kinds of grasses growing separately in plots by themselves, and can have specimens of them, from which he can easily select them from the fields, or from the swathes of hay. By selecting these, and sowing, in separate beds in his garden, these different kinds, a sufficient quantity will soon be procured to enable him to sow his land with those seeds. From the premiums offered by the Dublin Society, for the collection of these seeds, it is also to be expected, that in a few years a sufficiency will be collected to furnish the country with a quantity of these valuable seeds; which also may be procured from Messrs. Gibbs and Co. seed-men to the Board of Agriculture in London.

Of all the grasses, and perhaps, of all the plants, grown on any soil, the most profitable is CLOVER, and as the cultivation of this valuable plant is little, or rather not at all understood in this county, I beg leave to set down the mode, in which it is cultivated in England, in the greatest perfection. By *Clover* is here to be understood the RED CLOVER, which is grown in the best cultivated counties in England, in regular rotation with corn crops, on all inclosed lands.

This

This plant grows a full crop in all the arable lands in England, from the sands of Norfolk to the clays of Cleveland and Suffex. Various soils, that have been exhausted by corn, and not much accustomed to clover, have been so much restored by it as to produce a good crop of wheat; but to do this, every means should be used to secure a full crop, as that is of itself an excellent preparation for corn, and seldom fails of ensuring a considerable produce, arising from shade smother and putrefaction, the natural and constant attendants of full grown clover.

PREPARATION.

This plant has the uncommon great merit of not requiring any extra preparation of the soil, nor any expense above the seed. All that is necessary is, that the land should be clean, in the same manner as for corn, and it may be sown with advantage either with barley, oats, or wheat.

SEED, (*quantity.*)

Twelve or fifteen pounds per English acre, (that is, from nineteen to twenty-five pounds the Irish,) is the quantity usually sown, though it ought to vary with the nature of the land. In rich land every seed vegetates,

getates, and comes to maturity. On land, that is rather poor, a portion, perhaps a quarter of the seed dies after vegetating. On land, that is much exhausted, or naturally very poor, a great many of the young plants die, and much of the seed does not vegetate at all. In order to make up for such failure in the success of the plants, the quantity of the seed should be increased in proportion to the poverty of the soil, and decreased in proportion to the richness of it, and also with regard to the suitability of the crop to the nature of the soil. Nineteen pounds sown with barley, on a loamy sand clean and in good heart, is sufficient; twenty-five or twenty-eight pounds will not be too much, sown with wheat, on a stiff loam, on a clay bottom.

STEEP.

Not any used, though it would unquestionably be better, and force the seed into a more general and quick vegetation.

TIME OF SOWING.

Among spring corn, it is sown so as to allow short tined harrows, that are covering in the corn, to go once, or at most only twice, in a place, after the clover is sown, to give it thereby a thin covering, as
the

the seed being small, round, and heavy, may easily be buried at too a great depth. When sown among wheat, the best practice is, to sow the clover as soon after the middle of March, as the land is sufficiently dry to bear harrowing. After sowing in both cases it should be rolled.

CULTIVATION WHILE GROWING.

If the land be in good heart, none is necessary, though the plants, while they are in the seed leaf, should be attended to every day, for the purpose of observing whether they are attacked by slugs, &c. which are too frequently as fatal and destructive to clover while in its tender state, as they are to turnips, and the same means of prevention should be adopted.

HARVESTING.

Every where near London, it is mown when the greatest number of heads are in blossom, but rather sooner than later, as the error of mowing the first crop too early would be fully compensated by the increase of the second. The proper time for mowing it may be known by observing the bottom of the plants, and care should be taken to mow it, when the lowest leaves shew the symptoms of decay, by dropping

ping off. For, if the crop is suffered to stand longer, the consequence will be, that it will lose more at bottom than it would gain at top. This takes place near or soon after the middle of June.

When it is mown, the swaths should not be spread, as is the practice with meadow hay, but suffered to lie in the swaths as the scythe leaves them, until they are dried about two-thirds through, which, if the weather proves favourable, will be in about three days; if the weather should then look promising, the swaths may be turned with rakes immediately after the dew is off, and if no rain falls, it will be fit to cock the next morning, (the fourth day) as soon as the dew is gone, and may be carried in directly.

If this is done as soon as the dew is off, the leaves will be just sufficiently tough to preserve them, but when this operation is omitted in the morning, and performed in the heat of the day, the leaves will be too dry, reduced to dust, and lost in the business of heaping and loading. If, however, it is heaped in good time, the loading and stacking may go on all the day; when part of it is become too dry, there is an art in pulling the rows into heaps, to avoid rubbing the leaves off. This is only familiar to some of the best work people, and is rather difficult to describe; but it is done by very lightly rolling the swaths over with larger forks than usual, keeping it whole or together, laying it lightly into the cock, and being careful to avoid breaking and tossing it about, shoving it on the ground, or beating it down.

The cattle should be kept out of the field, and the second crop will be in full blossom, and ready for the scythe, so as to be mown the last week in August.

This crop must be harvested as the first, and should not be longer delayed, both on account of its losing in weight, as aforesaid, and getting into stack before the equinoctial rains* set in; after this there will be a little sheep feed previous to the breaking up the land.

PRODUCE.

A showery summer produces great crops, and a very dry one stints them to one half. The natural quality of the soil has considerable effect, and its being in a high or low state of cultivation, has still more; but on the general average of years and soils, the two cuttings produce about three loads of marketable hay, which, in the same proportion, should produce on an Irish acre four tons of twenty cwt. each.

HOW

* In case of rainy weather, and the consequent danger of its heating, it is a good way to mix with the clover old straw, by shaking it through it when putting it into stack, or in alternate layers. The straw becomes thus impregnated with the juices of the clover, and while it assists in preserving it from heating, it is eaten with great avidity.—See *Agricultural Report of Cornwall*.

HOW DISPOSED OF.

“ The practice of keeping horses in the house, sheds, or fold yards, all summer, upon cut clover, tares, &c. is now very generally adopted by the best farmers, who find their horses thrive better, are cheaper kept than depasturing at large, and also that a quantity of manure is gained by that means, which otherwise would have been in a great measure lost, or of very little use ; as the dung of horses, when dropped in pastures, is mostly destroyed by insects in the summer season. An acre of good clover used in this manner, will keep from two to three horses, from the beginning of June till the end of October, about twenty weeks.”

“ A great objection against clover arises from its being apt to heave cattle by the sudden fermentation of the clover ; to prevent this inconvenience, cattle are put upon it in the middle of the day when it is free from any dew or moisture, they being first filled with natural grass, which hinders them from eating so greedily as if put on hungry. If the clover once pass they seldom take harm afterwards ; by using this precaution we have not had any hoven cattle for several years.”

“ When very much swelled an instrument is used, (similar to that used by surgeons in tapping for a dropsy) ; it is so contrived, that after being thrust in
between

between the rib and the hip, on the near side, one part pulls out while a tube remains in the orifice, through which an amazing quantity of fetid air escapes, and relieves the animal; but they apt to be hoven again afterwards."

"We have heard of hoven cattle being relieved by giving them an egg shell full of tar."

"Clover is likewise made use of in fattening sheep, from the beginning of April to the end of May, (by which time or sooner they may be sold to the butcher,) then kept uneaten till July and mown for hay, in about two or three weeks after the said hay is off; sheep, intended to be fattened with turnips, should be turned in and kept there till they go to turnips. With the exception of uncommon rich marshes, there is no pasture will support so much stock as clover and ray grafs."

EXPENCES.

	£.	s.	d.
Fifteen pounds of red clover, and 5lb. of white, at 6d. is 10s., sowing the seed and repairing hedge-rows and gates, three shillings, - - - - -	0	13	0
Mowing, making, team, stacking, straw and labour, thatching stack, - - - - -	0	15	0
		<hr/>	
		1	8
		<hr/>	
	0	2	Dung,

See the Agricultural Reports of Middlesex and Northumberland.

	£.	s.	d.
Dung, or top dressing, or showering with liquid manure, when used, -	1	10	0
Cutting, tying, and marketing, four shillings per load, but say per acre, -	0	8	0
<i>Total expence of the first crop, per acre,</i>	3	6	0

THE SECOND CROP.

Mowing, and making as aforesaid, 15s. cutting, making, binding, and marketing, as aforesaid, 4s. together, - -	0	19	0
<i>Total expence, per acre,</i>	£.4	5	0

PRODUCE AND PROFIT OF A CROP OF CLOVER.

The first crop varies, from one load (18 cwt.) to three.

The second crop, from half a load to two loads.

Together, from one load and a half to five loads.

About three loads, I think, would average the county (of Middlesex), the price in the London markets would average about 15s. a load, higher than meadow hay, and for these last three or four years it has produced about 5l. 15s.; but suppose it only at 5l. 10s. per load, the hay would produce 16l. 10s. per acre.

After the second crop is off there is usually a little sheep feed, worth about 5s. per acre, which make the whole produce of an

acre, - - - -	16	15	0
Deduct, as above, the expences, -	4	5	0
<i>Remains profit, per acre,</i>	12	10	0

In the county of Northumberland, they have two tons on the statute acre, the first crop. Taking the average in England on clover crops, to be two tons and an half of hay, including the first and second crops, would be four tons of hay. The only great expence to the Irish farmer is, the expence of seed, for which this year I paid 25s. per stone, of 14lb. The seed was imported from London. I purchased this from a man in a small village in a neighbouring county, who has this spring (1801), taken to the amount of near £. 500 for clover seed. So that, although they are so little acquainted with the advantages of clover in this county, it is pleasant to find that it is getting into use in the country, although in a state of imperfect management,

Laying arable Land down to Grass.

The humidity of the climate of the Island renders it peculiarly favourable to grass; it is, therefore, the extreme of ignorance and absurdity for people to maintain, that grasses sown on their lands do not thrive.

In this county, nor in any other part of Ireland, can the farmers ever be considered as getting into any thing like a proper course of husbandry, until they get into the general practice of laying down their land with grass seeds, and that not in the exhausted worn out state, in which it is left after repeated crops; but

after

after being cleaned and meliorated by green root crops. The great complaint I found was, the difficulty of getting hay-seeds. This may be obviated, and can only be obviated by taking some pains at first to procure or gather good seeds, and after once got into them, to make it a rule to have the land previously perfectly clean, so that no other grasses will grow but those you put down.

It is adviseable, when grass seeds are sown with oats or barley, to sow the grain thin, scarcely one half the common quantity, which will shade the seeds without destroying their vegetation. It is also the custom amongst the best farmers, to suffer the grass after the corn is taken off to be very little fed, and it is heavily rolled the next spring, in order to press the soil home to the roots.

In land not so highly conditioned, the laying down to grass-seeds would be very successful by cleansing the ground well after a crop of winter tares had been fed upon it, then laying on manure, ploughing it in with a very thin furrow, and in August or September sowing grass-seeds without corn. The produce will be a most abundant crop of hay the next summer.

In this county corn crops can only be grown with advantage in the rich lands near the sea, and, perhaps, in some vales consisting of strong loam.

Grass ought to be considered as the staple roots, to clean and renovate the land, and one crop of corn to lay down with. In this mode the whole of that part of the county, now under culture, may be re-
stored

stored, and kept in a constant high state of fertility. It is very justly observed by Mr. Marshall, "That grasses improve the land, and those, who wisely adhere to having a large proportion of their farm in them, may boast of a constant plenty of crops. It is the subterfuge of ignorance or knaves to say, that grasses do not thrive on their lands; but the true reason is, because they do not lay their lands in proper condition, nor with proper grasses and good seeds; for certain it is, where corn grows grasses may grow also, and that they are, when properly managed, very profitable to the farmer, let his land be whatever it will, as they keep the land constantly in good heart, so and afford the most constant and rich produce to the cultivator."

SECT. 9. *Hay-making.*

IN this very important branch of the rural art, the farmers in this county are as far behind hand, as they are in the proper means of the production of those grasses tilled to make the best hay, or in the management of the land, on which it is grown.

I was myself witness to the great effect of superiority in management last year, by Mr. Mills, who pursued the best English mode of hay-making, by which his hay was evidently superior to any I found in any part of the county.

I think

I think I cannot render a more important service to this county, and indeed to most other districts in Ireland, than by relating the mode adopted of making hay in England; and, as Mr. Middleton has in this particular given the mode of carrying on the operation day by day, I shall beg leave chiefly to borrow from his admirable Report of Middlesex.

He states, that the mode of procuring proper feeds is very difficult. Large quantities were sold at the Royal Mews, Charing-cross, at ten pence a bushel, where the best hay is consumed; consequently it is the most likely place to procure the best feeds; and they certainly, upon examination, look particularly well and bright; but this appearance is principally owing to the greatest part consisting of blossoms, instead of feeds; the reason of which must be, that the hay was made while the grass was in blossom, before the bulk of the feeds were perfected; so that amongst twenty bushels of these pretended feeds, there is not really contained more than two pecks in a good and perfect state. But then they are of the earliest kind, and will generally consist of meadow foxtail (*alopecurus pratensis*.) This grass is of great value, and may be easily collected by children from the swaths during mowing time in great abundance.

But the best way for a general assemblage of meadow grasses, is to save a piece of fine old meadow, such as is known to abound with the best grasses, by letting it stand for three or four weeks longer, until it is perfectly ripe. Then mow the grass, and thresh it, without suffering it to heat in the stack, and *during*
autumn,

autumn, the *same year*, sow the land you intend to lay down with the seeds thus procured. To which add, for every acre, 10lb. of white clover, 3lb. of yellow clover, 2lb. of the red honey suckle, 5lb. of timothy, 1lb. of ribwort, and 2 or 3lb. of burnet; together with soft grafs, foxtail, ryegrass (and in some cases sainfoin) or any other meadow grasses, that may be obtainable.

The neat husbandry and superior skill and management, that are so much, and so justly highly admired, in the *arable* farmers of the best cultivated districts, may with equal justice be said to belong, in a very eminent degree, to the *hay* farmers of Middlesex: for by them, may very fairly be claimed the merit of having reduced the art of making good hay into a regular system; which, after having stood the test of long experience and practice, is found to be attended with the most desirable success. Even in the most unfavourable weather, the hay, made according to the Middlesex manner, is superior to that made by any other method, under similar circumstances. It is to be regretted, that this very excellent practice, has not yet, except in a very few instances, travelled beyond the borders of the county.

In order that the subject may be more clearly understood, I shall relate the particular operations of each day, during the whole process, from the moment, in which the mower first applies his scythe, to that, in which the hay is secured in the barn or the stack.— Before I enter more immediately on this task, I would just premise a few observations, viz. when the grafs is
nearly

nearly fit for mowing, the Middlesex farmer endeavours to select the best mowers, in number proportioned to the quantity of his grass, and the length of time it would be advisable to have it at hand; which having done, he lets it out, as piece-work, or to be mown by the acre.*

About the same time he provides five-hay (men and women) to each mower. These last are paid by the day, the men attending from six till six; but the women only from eight to six: for an extra hour or so in the evening, when the business requires dispatch, they receive a proportionate allowance.

The mowers usually begin their work at three, four, or five o'clock in the morning, and continue to labour until seven or eight at night, resting an hour or two in the middle of the day.

Every hay-maker is expected to come provided with a fork and a rake of his own; but when the grass is ready, and labourers scarce, the farmer is frequently obliged to provide both, but for the most part only the rake.

Every part of the operation is carried on with forks, except clearing the ground, which is done with rakes, and loading the carts, which is done by hand.

Having premised thus much, I now come to the description of the business of the

FIRST DAY.

All the grass mown *before* nine o'clock in the morning, is tedded (or spread), and great care taken to shake

* Each man mows from an acre and a half to an acre and three quarters per day; some there are, who do two acres per day during the whole season.

shake it out of every lump, and to strew it evenly over all the ground. Soon afterwards it is turned, with the same degree of care and attention, and if, from the number of hands, they are able to turn the whole again, they do so, or at least as much of it as they can, till twelve or one o'clock, at which time they dine.

The first thing to be done after dinner, is to rake it into what are called *single* windrows; that is, they all rake in such a manner that each person makes up a row, which rows are three or four feet apart; the last operation of this day is to put it into grass cocks.

SECOND DAY.

The business of this day commences with tedding all the grass, that was mown the first day *after* nine o'clock, and all that was mown this day *before* nine o'clock. Next, the grass cocks are to be well shaken out of staddles (or separate plats) of five or six yards diameter. If the crop should be so thin and light as to leave the spaces between these staddles rather large, such spaces must be immediately raked clean, and the rakings mixed with the other hay, in order to its all drying of a uniform colour. The next business is to turn the staddles, and after that to turn the grass, that was tedded in the first part of the morning, once or twice, in the manner described for the first day. This should all be done before twelve or one o'clock, so that the whole may lie to dry, while the work people are at dinner. After dinner, the first thing to be done is, to rake the staddles into *double* windrows; then the
double

double windrows are put into bastard cocks, and lastly the single windrows are put into grafs cocks ; this completes the work of the second day.

THIRD DAY.

The grafs mown and not spread on the second day, and also that mown on the third morning, is first to be tedded in the morning, and then the grafs cocks are to be spread into staddles as before, and the bastard cocks into staddles of less extent. These lesser staddles, tho' last spread, are first turned, then those which were in grafs cocks, and next the grafs is turned once or twice before twelve or one o'clock, when the people go to dinner as usual. If the weather has proved sunny and fine, the hay, which was last night in bastard cocks, will this afternoon be in a proper state to be carried ; but if the weather should, on the contrary, have been cool and cloudy, no part of it will be fit to carry. In that case, the first thing set about after dinner is to rake that, which was in grafs cocks last night, into double windrows, then the grafs, which was this morning spread from the swaths, into single windrows. After this, the hay, which was last night in bastard cocks, is made up into full sized cocks, and care taken to rake the hay up clean, and also to put the rakings on the top of each cock. Next the double windrows are put into bastard cocks, and the single windrows into grafs cocks, as on the preceding day.

FOURTH

FOURTH DAY.

On this day the great cocks, just mentioned, are usually carried before dinner ; the other operations of the day are such, and in the same order, as before described, and are continued daily until the hay harvest is completed. In the course of hay-making, the grafs should, as much as possible, be protected both day and night against rain and dew by cocking. Care should also be taken to proportion the number of hay-makers to that of the mowers, so that there may not be more grafs in hand at any one time, than can be managed according to the foregoing process. This proportion is about twenty hay-makers (of which number twelve may be women) to four mowers ; the latter are sometimes taken half a day to assist the former. But in hot, windy, or very drying weather, a greater proportion of hay-makers will be required, than when the weather is cloudy and cool.

It is particularly necessary to guard against spreading more hay than the number of hands can get into cock the same day, or before rain. In showery and uncertain weather, the grafs may sometimes be suffered to lie three, or four, or, even five days in swath. But before it has lain long enough for the underside of the swath to become yellow, (which if suffered to lie long would be the case) particular care should be taken to turn the swaths with the heads of the rakes. In this state it will cure so much in about two days, as only to require being tedded a few hours, when the weather

is fine, previous to its being put together and carried. In this manner, hay may be made and stacked at a small expence, and of a good colour ; but the tops and bottoms of the grafs are insufficiently separated by it.

There are no hay-stacks more neatly formed, nor better secured, than those of Middlesex. At every vacant time, while the stack is carrying up, the men are employed in putting it with their hands into a proper shape ; and about a week after it is finished, the whole roof is properly thatched, and then secured from receiving any damage from the wind, by means of a straw rope, extended along the eaves, up the ends, and near the ridge. The ends of the thatch are afterwards cut evenly below the eaves of the stack, just of sufficient length for the rain water to drip quite clear of the hay.

When the stack happens to be placed in a situation, which may be suspected of being too damp in winter, a trench, of about six or eight inches deep, is dug round, and nearly close to it, which serves to convey all the water from the spot, and renders it perfectly dry and secure.

The Middlesex farmers are desirous of preserving the green colour of their hay as much as possible, though a lightish brown is of no disservice to it. Hay of *deep* brown colour, occasioned by its having heated too much in the stack, is said to weaken the horses, that eat it, by promoting the excess of urine, and consequently it sells at a reduced price.

If you would make your hay come out of the stack of a fine colour, and the beauty of the flowers to be preserved

preserved and appear, the hay, you have shaken out of bastard cocks to prepare for carting, should be cocked in the heat, and remain till next morning; then turn and open the cocks, for the air to take away the damp, that is collected, which otherwise would heat in the stack, and, of course, the beauty of the colour would be done away.

In the making of hay, some attention should be paid to the quality of the soil, and the kind of herbage growing on it. The hard hay of a poor soil is in little or no danger of firing in the stack, and should therefore be put very early together, in order to promote a considerable perspiration, as the only means of imparting a flavour to such hay, which will make it agreeable to horses and lean cattle: it will be nearly unfit for every other sort of stock.

I have thought it worth while to copy this valuable account of the process of hay-making, in order that it may possibly excite attention to this important object so very *little attended to* in this and most parts of the island. For a fuller acquaintance with the subject, I must refer to the Report itself.

In addition to the account here given, I shall only add, that it is the moisture received from the atmosphere, and not the sap of the grass, that is the general cause of the heating of hay. If the grass is dead, which it soon is in dry weather, and has not been wetted by rain, it may be early stacked with safety. But though it were ever so dead and discoloured, if it has been drenched in rain, and stacked without being skin dry, it will most certainly heat.

Agreeable

Agreeable to this fact, I am inclined to believe, that erecting extensive sheds, under which to carry the hay in rainy weather, would pay for the expence by the superior quality of the hay so made. An example of this management I have seen at the Duke of Argyle's, at Inveraray, where the climate is extremely variable and rainy.

His Grace has erected extensive sheds for putting up his cattle in winter. In the summer these, not being wanted for the cattle, are made use of for making his hay. The grass is never cut until the dew is entirely evaporated; it is then carried from the scythe under these sheds, where it is spread abroad and made, and afterwards put into the lofts above the sheds, or put into cocks and afterwards stacked. It is the best hay I have ever seen in any part of Great Britain, and possesses the full nutritious quality of the grass, so that bullocks brought in from grass are fattened on it without any other food. The horses fed with it scarcely require any corn, while hay bleached by the sun and rain, as is generally the case in this country, is hardly sufficient to keep cattle or horses from starving.

SECT 10. *Dairies and their Produce.*

THERE are no dairies of any consequence in this county. The milk in the northern part of the county is chiefly applied to the feeding of lambs for the Dublin market. This is done not by the lambs suckling the cows, as is said to be the practice in some parts
of

of England, but by women squirting the milk into the lambs mouths. They generally in this way give them from half a pint to a pint three times a day. This mode of management is very distressing to the poor children, whose parents prefer the advantage of rearing a few early lambs with the milk of their cow, to affording it for the nourishment of their infants. The poor people in this part of the county are not only guilty of this injustice frequently to their own children, but also to the public children, which they receive from the Foundling-house in Dublin, and by the price they receive with whom, they chiefly pay their rents. It ought, therefore, to be a point made, that no child should be given to any woman, who suckles house-lambs or kids.

With some of the more considerable farmers this business is very much attended to, but on account of the fatigue and expence attending it on a very large scale, it does not seem so much pursued by opulent farmers as I am told it was some time ago; and on conversing with some of the most extensive in this line, and who have sent the earliest lambs to Dublin market for some years past, I scarcely think that it pays for the hay they are obliged to give the cows, with the extra better keep for the ewes.* The price however

P

is

* Mr. Young, in his tour, tells a story of a custom of the farmers giving their ewes claret, in order to make them take the tup sooner than usual. I did not find any traces of this custom, whether from this article having become scarce, or the
the

is very considerable, being from a guinea and a half to five guineas. As therefore it is a point of industry, that might be of some consequence under proper management, it may be of use to the farmers to be acquainted with the mode, in which they rear their house lambs for the supply of the London market.

The sheep begin to lamb about Michaelmas, and are kept in an enclosed well-sheltered field during the day, and in the house during the night, until they have produced twenty or thirty lambs. These lambs are then put into the lamb-house, which is kept constantly well littered with clean wheat straw; and chalk (usually previously baked in an oven) both in lump and powder, is provided for them to lick, in order to prevent looseness, and thereby preserve the lambs in health. As a prevention against gnawing the boards, or eating each others wool, a little wheat straw is placed, with the ears downwards, in a rack within their reach, with which they will amuse themselves, and of which they eat a small quantity. In this house they are kept, with great care and attention, until they are fit for the butcher.

“ The mothers of the lambs are turned in every
 “ night at eight o’clock, into the lamb-house, to their
 “ offspring. At six o’clock in the morning, these mo-
 “ thers are separated from their lambs, and turned
 into

the farmers having discovered a more economical mode of treating the fair ladies of the fleecy tribe, I do not presume to determine. The farmers felt rather indignant at Mr. Young’s ludicrous account of their system, and insist he was imposed on in the relation.

“into the pastures.” And at eight o'clock, such ewes as have lost their own lambs, and those ewes, whose lambs have been sold, are brought in, and held by the head till the lambs by turns suck them clean; they are then turned into the pasture; and at twelve o'clock, the mothers of the lambs are driven into the lamb-house for an hour, in the course of which time each lamb is suckled by its mother. At four o'clock all the ewes, that have not lambs of their own, are again brought into the lamb-house, and held for the lambs to suck; and at eight the mothers of the lambs are brought to them for the night.

If a ewe gives more milk than its lamb will suck, the superabundance is given to the twins, or to any other lamb, whose mother may not be able to furnish it with sufficient food. The shepherd must in this case hold the ewe, or she would not suffer the strange lamb to suck. From their timid nature, it is extremely essential that they should be kept free from every species of unnecessary disturbance. This method of suckling is continued all the year. The breeders select such of the lambs as become fat enough and of proper age (about eight weeks old) for slaughter, and send them to market during December, and three or four succeeding months, at prices, which vary from one guinea to four guineas each. This is severe work for the ewes, and many of them die under excess of exhaustion. However care is taken that they have plenty of food; for when green food (viz. turnips, cole, rye, tares, clover, &c.) begins to fail, brewers grains are given them in troughs, and second crop hay

in racks, as well to support the ewes, as to supply the lambs with plenty of *milk*; for if *that* should not be very abundant, the lambs will become stunted, in which case no food could fatten them.*

The rearing early lambs for the London market is a very extensive business, and is now gone done to a great distance in the country, from whence they send them up in covered waggons. For this purpose they are at great pains to get Dorset ewes, which have the quality of taking the tup within a few weeks after their bringing forth. There seems, however, to be no natural impediment to ewes, any more than cows taking the tup at any season of the year. It chiefly depends on their being well kept. The improved method is to keep the tup by himself, at least with only a female or two to quiet him, introducing the ewes in succession. Fifty or sixty ewes are as much as should be trusted to a shearling or young ram; a full aged tup will suffice double the number. The ram and ewe are kept for breeding four or five years. Great advantage has been found in this county in crossing with the Dishley blood in the size of the early lambs. Perhaps a South down or a Dorset would be still better. Quære: Might not the farmers in this county supply with advantage the Liverpool market, as well as the Dublin, with early lambs?

SECT.

* Those who would wish to see the whole process of house and grass lamb feeding, may consult Middleton's Survey of Middlesex.

SECT. 11. *Price of hides, tallow, wool, and quantity sold.*

The price of hides and tallow is regulated in the northern part of the county by the Dublin market. In the southern part of the county this year

Hides were 1l. 17s. 4d. per cwt.

Wool 1l. 2s. 9d. per stone.

Tallow 2l. 16s. per cwt.

CHAPTER III.

F A R M S.

SECT. 1. *Their size.*

A GREAT part of this county, and particularly that part, which belongs to non-residents, is let in large farms, from two or three hundred acres in extent, to several thousands. The lands belonging to the see of Dublin, to the extent of many thousands.

It has been the fashion of late years to decry this mode of letting lands, and some non-residents in this county have refused to renew to those principal tenants, and have parcelled out their lands in small tenements, expecting from this arrangement to receive a considerable addition to their rents ; and I do believe, being also led into a persuasion of thereby ameliorating the
circumstances

circumstances, and adding to the prosperity of the immediate occupant of the soil.

To combat prejudices, which have gained current and popular admission amongst any of the classes, of which the community consists, is at best an ungracious office. Where those prejudices, however, are endeavoured to be impressed on men of exalted rank, and enlightened understandings, by holding out to them objects merely of immediate accumulation, it will be by no means difficult to engage them to dismiss such impressions from their minds. But in cases, to which there is superadded the specious appearance of humane considerations and general happiness, there is an inclination to give way to such dispositions rather than oppose them.

Truth, notwithstanding, demands a candid representation of the circumstances, which have presented themselves to our understanding, on a subject the most interesting of all others to the agricultural improvement of this island. We offer them with peculiar diffidence, as the result of immediate observation, and propose them only as objects of future investigation.

The improvement of land, like any other branch of employment, cannot be made without capital, and on lands, where the primary objects of the agricultural improvement are to be made, such as buildings, planting, fencing, enclosing, clearing the land of rocks, stones, draining, &c. not even including the slow returns to be expected for the expence laid out in manuring worn-

out

out lands, the capital required is necessarily much greater than on lands, where these improvements have been completed, and from whence returns are immediately consequent on the regular *routine* of cultivation, without any extraordinary expence.

In such circumstances the improvement of land can only, it is said, be consequent upon a very great length of tenure equal to the possession of the fee simple of the land, or upon a great extent of farm at a moderate rent, part of which the tenant can sub-let at a greater rent, in order to enable him to improve by laying out considerable capital on the part he himself keeps in his own hands.

In this county, and in every part of this island, where I have had the opportunity of investigation, it is not the small farmer even under leases for ever who makes any improvement. It is the capital farmer, who possesses a considerable farm on leases for ever, and next to him the possessor of extensive farms on tenures more precarious, who are at all the means of introducing improvements in agriculture, and from whom in this county there can alone be any expectation of introducing the new improvements, to which we hope not in vain, we have endeavoured to excite active attention.

“ Every man, says Mr. Middleton, who has had opportunities of making extensive and accurate observations on the produce of land, must acknowledge, that it is rather the larger (not the largest, or those who occupy the most land, who too often let a great part of it lie in a state little better than waste, as are

most

most of the sheep-walks)—I say, it is rather the larger farmers and *yeomen*,* or men, who occupy their own land, that mostly introduce improvements in the practice of agriculture, and that uniformly grow much greater crops of corn, and produce more beef and mutton per acre than others of a smaller capital. Surely the landlords, but especially the community, are much interested in the encouragement of this description of men, who, by their superior skill and industry, and from the advantage of a sufficient capital, are able to obtain the greatest possible produce from the land, and at the same time, by a judicious management, to increase its value."

Much declamation has been exercised † against the conduct of such primary tenants, to whom it is the custom

* Yeomen in England are those, who are farmers on the land, of which they have the fee-simple, and is their own property. In Ireland, capital farmers, who occupy considerable tract of land, or even smaller farms, are allowed to have this appellation. Of these there are a great many in this county highly respectable. The support, which the yeomanry of this county afforded to his Majesty's Government in the late rebellion, cannot be too highly praised. I should deplore any system as extremely injurious to the community, that would tend to lessen the number and respectability of this valuable class of his Majesty's loyal subjects.

† See Dr. Crumpe's essay; Mr. Young's tour; The Lancashire reports, where the primary tenants or middle men of Ireland are represented in the most atrocious light. Every one, who is acquainted with their bravery and loyalty in the late rebellion in this county, as I have been, must feel a warm partiality to this class of the community, at least in this county. What may be the effect in other parts of the island of letting lands in this manner, I am not prepared to state. Where large tracts are let for grazing farms only, I believe it is a very pernicious system. Vast evils I know have arisen from the same circumstance of late years in the northern and western parts of Scotland and the isles adjacent.

custom in many parts of this island to let out large tracts of land, and much indignation excited by a representation of the oppressive manner, in which they are, I am afraid too frequently, in the habit of sub-letting small portions of their farms. And I am clearly of opinion, that where a proprietor resides on his estate, he may divide it into small tenements, and by moderate rents, and proper encouragement, he may, according to Sir George Saville's saying, "encrease his income by lowering his rents."

It must also be admitted, that there are instances, although comparatively very few, of the primary tenants, who occupy large and extensive farms, behaving with want of propriety to their under-tenants. But the question is, whether it is better for a *non-resident* to let his estate in large farms to men of sufficient capital, who can be made accountable for the rents, or to let it in small tenements to poor tenants, and who, if they have not the rent at the time it is due, must have their cattle driven for the payment by an unfeeling law-agent, who has no interest in their welfare. And whether, in this case, the small tenant is not often more distressed by being immediately under the proprietor, than if an intermediate tenant was placed between him and his landlord, whose interest it is to exchange mutual kindnesses, and take his payments of rent in as easy a way as he may be capable of making them, frequently also advancing him small sums to make up accidental losses, or to relieve him in unforeseen calamity.

I believe

I believe I am perfectly warranted in saying, that with regard to this county at least, the experiments made of letting farms in small parcels to occupying tenants, and taking away the intermediate and primary tenants, have not answered the intended effect. And I have been well assured, that in cases, where this has taken place, there is greater poverty and actual distress than in any other part of the county.

On the whole, it is perfectly obvious, if every portion of the land, whether occupied by a greater or a lesser tenant, was cultivated to the extent, of which it is capable, according to the capital and industry of each, in a proper and intelligent garden-like manner, the tenant, the proprietor, and the community, would thereby receive incalculable advantages, and happiness and prosperity be universally diffused.

Every part of the land capable of cultivation would then be made to give forth, without exhaustion, its utmost produce. The proprietor, instead of receiving a small income from high rents for patches of his land, would receive a larger income, by moderate rents for the improved value of his whole land. Capital would be gradually accumulated by the industry of the whole. Farms would naturally become divided into those of a greater or a smaller size, according to the capital to be employed, and the larger tenant, with the larger capital, would look to accumulation from his own industry, more than from the industry of his sub-tenants, and they themselves would find, in improved cultivation, the certain means of aggrandisement, instead of
deriving

deriving a precarious subsistence from a repetition of a few miserable crops.

SECT. 2. *Farm-houses and Offices.*

THE farm-houses in this county of the principal tenants, are in the north and east of the county, in general of a superior style of accommodation, and their offices roomy and convenient. In the southern and western parts, as well as those that had begun to be erected in the mountains, they have been almost wholly destroyed in the rebellion. They are, however, rebuilding them, in general on a more commodious plan than heretofore, and all of them with slated roofs, where they were formerly only thatched. The habitations of the lower tenants and cotters are in general extremely wretched.

SECT. 3. *Mode of repairing them, whether by landlord or tenant.*

GENERALLY by the tenant, the land-holder in some cases supplying wood. On Lord Fitzwilliam's estate, a very liberal allowance is made for all improvements.

SECT. 4. *Nature of Leases.*

GENERALLY leases on lives, or a term of years, whichever lasts longest. On the estates of residents, three lives or thirty-one years:—on those of non-residents, generally twenty-one years or one life.—There are many farms, however, on leases for ever, a tenure very common in this country, but little known in England.

SECT. 5. *General state of leases, and of particular clauses therein.*

THE leases are in general not much loaded with restrictions. They have mostly a clause against what is called beat-burning more, or the greater beat-burning, and suffering beat-burning beg, or the lesser beat-burning, provided they put on the land a certain number of barrels of lime. As to burning more or burning beg, as Mr. Arthur Young says, if burning is good, the more the better.

Lord Fitzwilliam, in all his leases, reserves a power to plant a certain number of acres on each farm, which his agent generally has done in such a way as to add much to the appearance of the country.

He

He is also very liberal in giving to the smaller tenants trees to plant around their cabbins.

A singular circumstance enough has taken place within these forty or fifty years in this country. So little were proprietors scrupulous about the length of the leases they should grant, that leases frequently contained clauses obliging tenants after a certain time to take leases for ever of the farms they held, and there are not few instances where the farmer refused to abide by the clause, and rather threw up the farm than take it at rents not one-tenth part of what land now sets at. So far now are proprietors at a loss to find tenants, that there is a vast competition for every piece of land, that is out of lease.

On the subject of the general state of leases, it may perhaps not be thought irrelative to the object of the Society, that of future improvement, to throw out a few general observations, which are the result of considerable attention to this subject in different parts of the united kingdom.

In a former part of this Report, I have remarked, that there are many instances of farmers on leases of lives and even a liberal term, not improving. A similar remark presented itself to me in the county of Devon.* Whereas in some parts of Scotland, on a lease

* A circumstance happened respecting this, which I shall beg to relate. A short time after the publication of my Report by the Board of Agriculture, it had been circulated, from the remarks alluded to, that my report was most injurious to the tenantry, and a meeting of the neighbouring farmers was held at Newtown-Abbot, for the purpose of entering

lease of nineteen years, and in Norfolk, on a lease of fourteen years, farmers do not hesitate to lay out large sums of money in making improvements.

How is this difference to be accounted for? Clearly by the superior skill and knowledge of the business of agriculture possessed by the latter over the former. For it must be acknowledged, that however much the true principles of agriculture have of late extended themselves in Great Britain, the enlightened practice of husbandry is chiefly confined to Tweedside, to Leicestershire, and the north and north-eastern districts of England.

In Scotland, and the north of England, the improvements in agriculture have chiefly arisen from some of the proprietors of large estates employing as their agents men highly skilled in husbandry, to direct the tenants in the improvement of their lands, and the

improvement
ing into resolutions to be transmitted to the Board of Agriculture, in reprobation of the alleged misrepresentations therein contained. A friend of mine, a considerable farmer, near Totness, on hearing of the meeting, attended; and after allowing them to inveigh against the author and the report for some time, he asked them gravely if they had seen the report, and read attentively the part, at which they were so much offended. They confessed that not one of them had either seen the report, or heard it read, but they were sure it was very much against them. My friend then took it out of his pocket, and begged I might be heard in my own defence, on which they allowed him to read the paragraph, that had excited their indignation, and acknowledging their folly and the truth of the observations it contained, the meeting broke up without coming to any resolutions, and joining with my friend in a laugh at the ease, with which their credulity had been imposed on.

improvement of live stock, and also to shew an example themselves of superior cultivation.

In this island, and indeed in most parts of England, the only qualification required in an agent is to receive the rents, which certainly is by far the least part of his duty. If, instead of this, the proprietors of great estates would look out for men, who were sufficiently acquainted with agricultural concerns, to arrange and dispose of lands into suitable and convenient farms, and to point out and describe the very best mode of cultivating every acre in these farms, a change for the better would soon take place very rapidly in this part of the united kingdom. If, in addition to this, leases were granted and renewed solely on account of the improvements proposed to be made, which, if not perfected, should be forfeited, every thing would go on in a progressive advantage to the community, the proprietor, and the tenant.

In such cases as those, to which I allude, of improvements to be made, and tenants not be allowed to exhaust the land themselves, nor to sub-let to others without restraint, I am clearly of opinion, that leases, rather long, would tend most to the advantage of the *community*, where the tenant is possessed of capital, and the will and disposition to lay it out in improvement.

Where also, as in most parts of this country, the tenant has all the primary improvements to make, as clearing of rocks and stones, draining, fencing, &c. and often building, it will require such a lease as will give him ample security in receiving a return to himself

self and his family for the money he is about to lay out. And this also will be found to be the advantage of the family of the proprietor, as well as of the community. For the truth of this observation, I need only appeal to the improvement made on the Rockingham estate, in the barony of Shillelagh, and the adjoining district of Cashaw, within the last century, on which that family have always given long leases, and *allowed for improvements.* And although the present proprietor is from family settlements not enabled to renew for more than twenty-one years, or one life, yet the confidence the tenants have in their leases being renewed on moderate encrease of rent, does not impede them in making very valuable and extensive improvements. By which means the encrease of revenue to that family, in the last seventy years, is perhaps greater than on any non-resident estate, containing so great extent of mountainous and barren land, in any part of the island, and also under the disadvantage of being very remote from lime or other manure, and from any great town or navigable river or canal. So that, had it not been for the wise and liberal policy of this highly respected family, that part of the county of Wicklow, like many other extensive districts in Ireland, would have remained an unpeopled desert, covered with a few wandering herds of cattle.

SECT. 6. *Taxes or cesses paid by Tenants.*

County and parochial taxes. There is no land nor poor tax. It is one of the subjects of complaint noticed in a former part of this work, and very general, that the petty farmers load their cottiers and sub-tenants with a very undue proportion of these taxes.

SECT. 7. *Proportion of working horses or bullocks to the size of Farms.*

THIS is according to the quantity of land in tillage, which, on some farms of many hundred acres, does not amount sometimes to above twenty or thirty acres.

SECT. 8. *General size of fields or enclosures.*

THESE are very different in different circumstances. Five acres, or from that to eight, seems to be preferred for enclosed pastures. From ten to fifteen the general run of arable fields. On large farms, and on gentlemen's demesnes, they are of greater extent.

SECT. 9. *Nature of fences. Mode of hedge-rows and keeping hedges.*

IN the barony of Newcastle, on the eastern-side of the county, there are in the fences some live hedges; around some of the demesnes of the proprietors, who are resident, and of the capital farmers, different kinds of trees and brush-wood afford some appearance of shelter; but in the general aspect of the country, the agreeable sensations, derived from the view of those improvements, are greatly lessened by the contrast of by far the greater part of the county presenting you with the miserable appearance of crooked mounds of earth, covered here and there with ragged furze, affording little or no shelter, and scarcely any kind of fence against the wandering sheep, whose legs they often tie to prevent their getting a mouthful of the corn on their little meadows.

Some, however, of the resident gentlemen are with great spirit and propriety endeavouring to introduce a better system, and obliging their tenants to enclose with quicks. In all cases, however, it would be the best mode for the proprietor to divide and enclose the different farms at his own expence, and charge the tenant interest for the money so laid out, obliging them to keep the fences clean. This has been done with great success by the Right Hon. Mr. Foster, at Collon, and is now doing by Mr. Greene,

Greene, at Kilranelagh, in this county. Fencing, however, is very much neglected, and in many instances to the great injury of the proprietors and the land. In many circumstances, this neglect is to be seen in a most shameful degree, particularly of not fencing young woods after they have been cut down; many hundred acres of wood are destroyed from this neglect.

SECT. 10. *Mode of Draining.*

THE mountainous nature of this county presents every where innumerable springs both on the declivities of the hills and in the valleys, all of which might be easily carried under the soil by drains, and very often might be made of admirable use in irrigation. They are allowed, however, too often to form quagmires, or to run carelessly over the ground without the application of any skill or industry to direct them to the purposes of flooding or irrigation. Mr. King, of Kingston, has given to the country an admirable example of complete and skilful drainage. His farm, which is about 80 acres, was formerly an entire furze croft, covered with rocks and stones, and full of spuey quagmires. By blasting these boulders of granite, and burying the pieces in deep drains, he has formed this farm, in its natural state not worth sixpence an acre, into the finest pasture, arable and meadow

ground any where to be seen, and which cannot be considered at present as worth less than forty shillings an acre. He estimates the expence, at which this improvement may be made, on many thousand acres in this county, at about 10l. an acre. If, however, by laying out 10l. an acre, a permanent improvement can be made equal to twenty shillings per acre, what an excellent mode of laying out money? At the most moderate calculation, a sixth part of this county could be so improved, that is, upwards of 50,000 acres. Nor should any proprietor ever let a farm, without having it previously examined by a person well skilled in the nature of understrata and of drainage, as well as irrigation, and either obliging the tenant to make those improvements, or making them himself, and charging accordingly for the improved value. When also it is considered, what an additional source of employment these operations would afford to the people, it is certainly worthy the consideration of the respectable Society, to which this Report is addressed, to suggest to the Legislature some measures for accelerating so desirable an improvement, by which such incalculable advantages would be derived to the community.

With this view, as well as for the discovery of substances to be made use of as manures, every proprietor should have the understrata of his lands examined by the augur, and a plan made of it, particularly on the declivity, and near the foot of the hills, and by draining and irrigating alone, there is no doubt he might add a hundred per cent to his income, and in many cases five times that sum.

SECT. 11. *Nature of Manures.*

ON this head we have already made a number of observations. It is a subject, which is not easily exhausted, but which the bounds of this work do not admit of going into so fully as we could wish, and which we may take perhaps another opportunity of doing, if what has been advanced in this outline of husbandry meets with a favourable reception from the public.

We have already mentioned, that lime and marl are the chief sources of manure in this county. There is, however, a great part of it, where one of these articles, lime, is very expensive, and marl not to be obtained. Here particularly the most effectual way of manuring is, to raise green crops for the purpose of feeding sheep and bullocks with them on the land. This is the only method, by which the loss of very nearly all the urine, (in itself perhaps equal to the dung) and a considerable part of the dung can be prevented; for in the stables, cow-houses, sheds, fold-yards, and dung-hills, even under the best management, there is great waste, perhaps of half, including dung and urine; under the very careless management, that ordinarily takes place, three parts of the manure are lost; but in the soiling of tares, turnips, rape, clover, &c. in the fields, there is no loss; the whole is immediately applied, without the cost of carriage, to the enriching of the soil.

Manures

Manures are made use of for two purposes, either for improving the texture of the soil and giving it a greater degree of penetrability, or for supplying the food of plants. This penetrability of the soil is also much increased by active operations, such as fallowing, horse-hoeing, scarifying, &c.

By the extended knowledge of chemistry, it is now completely ascertained, that carbon or charcoal dissolved in water is the chief food of plants. This discovery was made by M. Hassenfratz, and is excellently explained by Mr. Kirwan, Dr. Darwin, and other philosophical agriculturists.

When vegetable bodies are burned without access of air, there remains a great quantity of charcoal or carbon, as it has been called by the French chemists. This is now known to be one of the most universal materials of nature. And as vegetables bodies contain so much of it in their composition, they may be supposed to absorb it entire, when they grow vigorously. The whole atmosphere contains always a quantity of it in the form of carbonic acid or fixed air, which, being heavier than common air, is constantly falling down on the earth, particularly in the form of dew. Hence, therefore, the great advantage of constantly stirring the earth between the rows of vegetables, by which it acquires a greater portion of this material to be conveyed to the roots of plants.

Lime has also a great tendency to unite with carbon, either in the soil or in the decomposition of vegetable matter, and thus to render it soluble and fit to enter into the plants as their food.

On this account, the lime, which is designed to be spread on land, should be previously laid in a heap, and either suffered to become moist by the water of the atmosphere, or slacked by a proper quantity of water; otherwise, if it be spread on wet ground, or when so spread be exposed to much rain, the heat generated will be dissipated, without breaking the lumps of lime into powder, which will then gradually harden again into limestone, disappoint the expectation of the farmer, and afflict him with the loss of so much labour and expense.

Carbon also seems to become soluble in water by putrefactive fermentation of vegetables, especially by the fermentation of the dung of animals, as appears by the black liquor from dung-hills, which therefore ought to be carefully preserved.

Dung-hills ought, therefore, to be made in a hollow place, the bottom either well panned, or made of hard rammed clay. No water ought to be suffered to flow on them from the high grounds, or the eaves of the farm offices. The simplest and best mode I have seen is, to form the dung-hills into oblong pies, built round with fods about three or four feet high. When one of these is filled cover it with earth about a foot or eighteen inches, from old hedge-rows or virgin soil. It is a very good plan also to cover the bottom of these pies with old earth. The whole afterwards being turned over and mixed with the fods, &c. forms an excellent compost.

A reservoir should always be made for the black water, that drains from them, which answer admirably as a top-dressing, being showered from carts made
like

like those for watering the streets, and used either on grass land or as a top-dressing for grain crops, as wheat and barley, or also for moistening collections of weeds, earth, and other substances to form composts.

Scrapings of roads, sweepings of ditches, paring the sides of them, &c. are frequently made use of here, and are very proper materials for manure and for composts.

It is also a very common practice to pare or spade the heathy ground near bogs and morasses, and burn it to spread on their meadow ground, and frequently also as a manure for cabbages. On the borders of the extensive bogs in the South, these are formed into large heaps, and, from their appearing at a distance perfectly white, have the appearance of lime; but on a near inspection this white appearance arises from the great quantity of coarse quartz sand, contained in the turf so burnt, which must be a very indifferent fertilizer. At the same time the great body of fire, contained in these heaps, reduces the turf and all the vegetable matter contained in it to ashes. *Quaere*; Would not slow combustion in small oblong heaps answer better by not destroying the whole of the vegetable matter, and reducing it to charcoal instead of ashes?

The *black peaty earth* laid up to drain, frequently turned over and mixed with lime, is, of all others, the best dressing for upland and light grass land. An intelligent farmer shewed me a field, one half of which he had manured with black peaty earth without lime, and the other half with dung from his cow-houses. That manured with the peaty earth was by much the most luxuriant.

The Rev. Mr. Truell makes use of lime as a top-dressing, on his young grain crops, on land, which he has reclaimed from bog.

In Lancashire, marle has been introduced as a manure after being burned, which may be in a kiln after the manner of lime, or laid over a gutter, under which faggots, &c. for fuel have been previously laid. It has also been burned in a common oven, and in both ways been found to answer at about ten bushels per statute acre, (four barrels to the Irish acre) after being bruised into a kind of powder, and sown with the hand as a top-dressing.

It would be very much worth while to try this, not only with marle, which might thence become an object worth being carried to a distance to the mountainous grounds, but also with limestone gravel, which consists of marle and pebble limestone, the small pebbles of which would thereby be converted into lime.

Mr. Buckley, of Leicestershire, I am told, burns clay in this manner, and finds it to answer as a manure. He makes four gutters or funnels with stones or bricks, and in them places faggots and culm, over which he puts the clay, and when one layer is thoroughly heated and burned, he adds another, until it is raised into large a mound. Something of this nature would answer with marle or limestone gravel, making use of peat and furze instead of culm.

An improvement on this might be made by building a sod wall around it, as in the common imperfect lime-kiln, and to encrease the heat by putting in additional layers of peat and furze.

Paring and burning is a mode of manuring the land, which has been long reprobated from an idea of its destroying and diminishing the staple of the soil. In my account of Devonshire I have had occasion to observe, that, notwithstanding the fears of theoretical writers on this head, the practice has been continued in the South of Devon for three hundred years, without diminishing the staple or the fertility of the soil.

It is expressly stated in the Middlesex Report*, that on Enfieldchace, where this apprehension led the farmers to plough up tough, wiry, bent, and heathy oldsward, without paring and burning, the parties suffered a great loss. Nor were they at all more benefited by thinking to meet with every success from *paring only*, and carting the parings off the land into heaps, there to remain until the mass should be reduced into mould.

The impropriety of breaking up this kind of land, without paring and burning, is manifested in the neighbourhood of Beach-hill, where land, after twenty years inclosure and cultivation, is in a worse state now than it was originally. The original wiry, bent, and dwarf shrubs, are now growing in full vigour.

The only possible objection, that can be advanced against this practice, arises from the *rapacity* of the occupiers, who finding, that from the first crops of corn the land is in great heart, go on in sowing corn repeatedly, until the land is wholly exhausted.

So

* Middlesex Report, page 295.

So that, instead of making a law, as has been in this country against paring and burning, the law ought to be against the *knaveish* occupier and the *negligent* land-steward, who permits so infamous a succession of crops. There is no more propriety in thus *generally* condemning paring and burning, than there would be against all warm stimulating crops.

“ But paring and burning has more merit than any other manure, in its property of converting heath, furze, shrubs, and wiry bent into coal, most fitly prepared for the food of plants ; and it will pulverize such a soil, as much in two years, as all other means can effect in twenty.”

“ Paring, burning, and liming at the same time, is the most efficient and cheap dressing, that can be given to land in the breaking up of commons and rough pastures, where the natural productions are ling, heath, furze, rushes, and coarse grass. On whatsoever soil they may be found, it never has failed of advancing the land to the first degree of fertility ; and he must be a very bad farmer, who cannot continue, for any length of time, land so enriched in a high state of productiveness.”

“ Suppose two or more of each of the crops of turnips, tares, rape, and clover, to be raised and fed on the soil, and the land then laid down to grass without corn, in such case, it cannot be doubted, but the herbage would be most abundant, and its duration, if continued in pasture, would be coeval with the land.”

The quantity of land, that might be improved in this county, by paring and burning, liming, and taking
repeated

repeated crops of tares, turnips, rape, and in very poor mountainous soils chicory, is immense. There is a space from Powerscourt deer-park to the high mountains, above the Seven Churches, consisting of near 12,000 acres, that might be made worth 20s. an acre, for feeding ground, by this practice, and I do not believe the expence would exceed, under proper management, £.7 per acre.

After paring and burning with a small quantity of lime, say 25 or 30 barrels, sow rape, and feed it on the ground, after which turnips, or tares, or both, and sow it down with grass-seeds; it will become some of the best pasture land in the county. Rye is very good to mix with tares for feeding off.

I have known rye sown in Cornwall on poor moory soil, for spring feeding for ewes and lambs, answer extremely well.

The *chicorium intybus*, or chicory, introduced by Mr. Young, (which is the wild endive, not the dandelion, as stated by some writers on agriculture,) is a most excellent plant on all poor thin soils. From the following experiment, I think it will do on any mountain soil in the whole county, and be a wonderful acquisition.

In the year 1797, on a very poor field in the neighbourhood of Prince-hall, in the forest of Dartmore, in the county of Devon, belonging to the late Mr. Judge Buller, consisting of fifteen acres, chicory was sown by his orders. When it came up, his bailiff, mistaking it for weeds, thought the seed had failed and ploughed up the field, to lay for a summer fallow. In the autumn

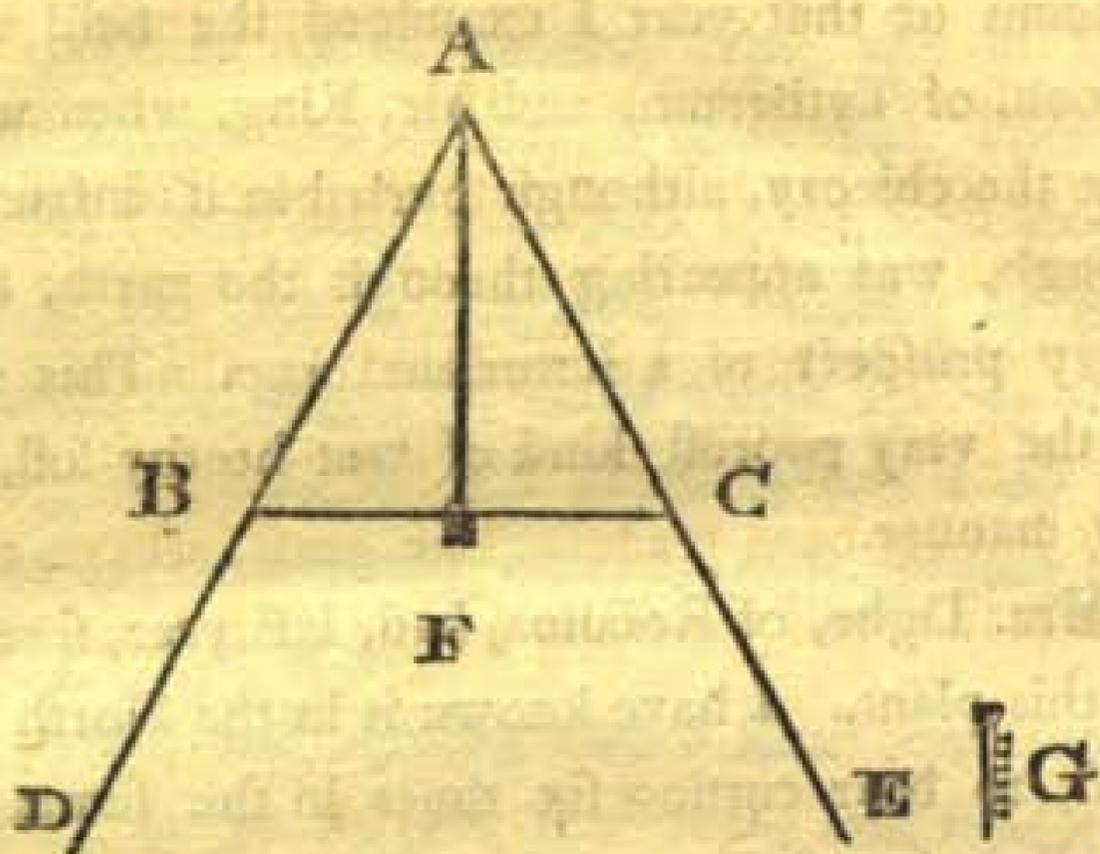
autumn of that year I examined the field with Mr. Crook, of Tytherton, and Mr. King, when we found, that the chicory, although buried in its infancy by the plough, was appearing through the earth, and with every prospect of a luxuriant crop. This land was of the very poorest kind of wet heathy soil, without any manure.

Mrs. Tighe, of Rosanna, had, last year, several acres of this plant. I have known it in the North of Scotland, to bear cutting six times in the summer. It is excellent for foiling cattle. Calves and pigs are remarkably fond of it.

Watering is another kind of manure, already practised pretty generally in the Southern part of this county, but, except in the single instance of a meadow belonging to Mr. Mills, at Cronebane, with very little attention to science or economy in the distribution or management.

To enter into any minute directions on this subject would much exceed the limits of this work. I had an instrument made at the Rev. Mr. Symes's, at Ballyarthur, with which also I laid out a water-meadow last year at Mr. Tighe's at Woodstock, which is very simple and expeditious, of which also I have given a drawing in my Report of Devon. It is merely a level in the form of an isosceles triangle.

A B



A B C having the sides extended to DE, being 12 feet in length, with an expanse of ten feet, and a weight F hanging from A to intersect the base B C. Let one of the legs as A D remain fixed on the point D. Move the other A E round D as a centre until AF bisect the base B C. The point E will then be on a level with D, and the space D E form ten feet of the conducting canal. Proceed in a similar manner from E and so on, until your intended canal is finished. A graduated iron pin G may be made use of to direct the fall of the canal, so as to draw the water to follow, for which purpose an inch is generally sufficient in 100 feet. The distributory cuts should not be more than two inches deep and four inches broad. The feeders, or leading cuts may be twice or three times that breadth, but should not be more than two inches deep. By this means the water is diffused through the roots of the grass in the most easy and gentle manner. The feeds placed loosely on the sides of the cuts, with the grassy side uppermost,

so as to let the water filter through them, should be particularly attended to. In this manner a meadow of several acres can have water distributed in a few hours. When the meadow is intended to be kept up for mowing, the fods may be replaced in the cuts, and the whole being rolled, there will be no loss of grass by their having been made. The grass, where cuts have been made, will generally be the most luxuriant.

CHAPTER V.

GENERAL SUBJECTS

SECTION I.

POPULATION.

THE number of houses, in the return of the hearth money collectors, are stated in Dr. Beaufort's Memoir to his map of Ireland, to amount to 11,546. From some enumerations of the number to a house made by the Rev. Mr. Whitelaw, Mr. Henry Tighe and others, I cannot take the average number at more than five and an half to a house. The inhabitants may therefore be computed at 58,000, a very small population for so large an extent, amounting only to 23.75 in a square mile, and 26.6 acres to each house on an average.

Or about 1000 souls to each parish, averaging about 5,370 acres.

But it is to be taken into consideration, that almost the whole of Balinacor, at least five-sixths of it, is uninhabited, and a very large tract in the barony of Talbostown, which together cannot be estimated at less than one-third of the extent of the whole county. This being taken from the whole number of acres and the

the remainder taken at 200,000 will give 17.33 to a house, or about 3.13 acres to an individual, which is by no means so despicable a population as would appear from Dr. Beaufort's statement, considering that it is entirely an agricultural population; there being no large towns or villages in the county.

The agricultural population, on an average, of all the cultivated land in England and Wales, is about one inhabitant to little more than thirteen acres*, which would in the same proportion allow eight acres to be a similar proportion for the cultivated lands in Ireland.

SECT. 2. *Number and size of Villages and Towns.*

Wicklow, which is the county town, does not contain above 1,250 souls; Baltinglass, not above one half, and Blessington not a third; Carysfort only a few houses. These were formerly boroughs, and sent representatives to the House of Commons, but are not considered as of sufficient population to send any to the United parliament. Nor are there any other considerable towns or villages. The principal are Bray, Newtown Mount Kennedy, Rathdrum, Arklow, Tinehely, Carnew, Stratford-upon-Slaney, Dunlavan, Donard, and Inniskerry.

R

These,

* The cultivated land in England and Wales is thirty-nine million acres, which being divided by about three million of agricultural inhabitants, gives a fraction more than thirteen acres.—See the *Middlesex Report*, p. 452.

These, however, although very small, have all of them weekly markets, where meat can be had, and on the eastern coast plenty of fish in the season. They are, however, by no means improved to the extent, of which they are capable, though possessing almost every one of them great advantages in point of situation, having streams of water adjacent, capable of working machinery for various manufactures, particularly the woollen*, with good falls for mills, and in some the additional advantage of abundance of turf for fuel.

SECT. 3. *Habitation, Fuel, Food, and Clothing of the lower rank—Their general cost—Price of Wages, Labour, and Provisions.*

THE *habitations* of the lower order in this county are in general extremely wretched, miserable hovels, that can scarcely bear a description. A bare recital of the state of this class of the community has been considered as an unmerited satire on the country, and those

* By the desire of Mr. Wainright, Lord Fitzwilliam's agent, I measured the stream of water at Tinehely, in the driest part of last summer (1800,) and found it afforded at the bridge 127,12 tons of water in an hour. Excellent falls might also be had either above or below the bridge. Abundance of turf for fuel, and a populous neighbourhood, the people industrious, and the women accustomed to spinning woollen yarn. Altogether an excellent situation for establishing a branch of the woollen manufacture.

those, who have endeavoured to call the attention of the public to the amelioration of their situation, have been stigmatized as incendiaries*.

A cowardly apprehension of unmerited censure, or a truckling disposition to court popular applause, would be equally disgraceful to the Reporter on any subject, the investigation of which the respectable Society, to which this is addressed, deem necessary to lead to the future improvement of the country.

“Not to extenuate, nor set down ought in malice,”
Is a maxim most religiously to be preserved, and as this is open to future correction, it seems best to omit nothing in order to excite communication and induce attention.

In those parts of England and Wales, which are purely agricultural, you roam with pleasure from extensive demesnes to surrounding hamlets, in the midst of orchards; you wander from cottage to cottage, welcomed by the smile of cheerfulness, and gratified by the comfort of their habitations; the women and children are well clothed and well fed, nor are any to be found absolutely poor, in such situations so as to become chargeable to the parish, but the extreme old, the blind, and very young children, who may have unfortunately become orphans.

That in a district in this island, which contains none of those large and crowded manufactories, which al-
ways

* I allude here to a letter published in 1796, by a very worthy minister in this district, which, however, is so moderate and correct, that I have followed it in the scope of the following observations.—See Letter to the Right Hon. Henry Grattan, by the Rev. Mr. Sandys.

ways occasion a numerous poor, the circumstances of the lower class should be extremely wretched, as is generally the case in this county, and many other parts in Ireland, under similar circumstances, is a lamentable evil, which it is absurd to deny, however difficult it may be to point out the road to redress.

To estimate the general cost of the mud or fods formed to prop up a roof of miserable thatch, that hardly defends them from the falling rain, and often permeable by every breeze, is only difficult from the smallness of the expence it must occasion. A farmer shewed me several new cottages he was erecting for his labourers, in a stile of superior splendour to most I had seen, and where the little wood made use of was necessary to be purchased. These he told me would cost three pounds each habitation. So that thirty or at most forty shillings would be a sufficient estimate for the general run of the cabbins for the labouring cottier. Yet for such hovels with a patch land of a rood in extent, two guineas is the common charge to the occupant*.

In the towns and villages cabbins may sometimes have cost a pound or two more. The rent is seldom less than two guineas, and often three guineas, without any garden or potatoe ground. Nay, in one instance a gentleman

* It is asserted in a late publication, which pretends to great accuracy, that it is usual in the county of Wicklow to let a cabin and an acre of land for two guineas a-year. I shrewdly suspect, that the worthy Baronet's informant mistook *acre* for *rood*. An error of *trivial consequence* in a compilation intended as the ground-work for the future historian of the present times.

a gentleman, who took some trouble to inquire, found that in the town of Wicklow, three guineas were paid for the rent of a cabin, absolutely without a roof, and this I must add, held immediately under a great proprietor, who certainly is wholly unacquainted with the circumstance, otherwise he could not suffer such to exist, and whom, therefore, it would be unfair even to name.

That, however, a single instance of such a nature should exist, is only one of the numberless proofs, which must force themselves on the impartial inquirer, in many parts of this island, of the indifference and neglect to the amelioration of the state of the lower orders, which too generally has prevailed, but which I am happy to observe, there is every prospect of being rapidly done away, at least in this county, as I every where found the gentlemen of the country uniting in relieving their distresses, and some of the leading proprietors taking very active measures for their future and permanent comfort*.

With regard to the *fuel, food, and clothing* of the lower ranks, and their comparative value with the price of *wages, labour, and provisions.*

It

* The Earl of Meath is building a set of cottages for his labourers, on a very convenient plan. Lady Dennis has a beautiful crescent of cottages for her labourers. Mr. Henry Tighe, this summer, has built two cottages for his labourers, on the plan given by Mr. Holland, and published in the volume of Communications to the Board of Agriculture.— These cottages cost £.79, or £.39 10s. each, and are very complete and comfortable. Mr. Tighe considers, that by getting two guineas a-year for each of these he is paid sufficient interest for the money laid out.

It is perfectly evident, that in the present failure of potatoes, their usual food, the labourer in agriculture could not subsist on the price he receives for his labour were it not for the gentlemen of the country uniting, as I have stated it, in raising funds for the purchase of food, which they sometimes sold to them at a reduced price, and in many cases gave away provisions to a great amount.

It certainly deserves to be recorded, that Lord Fitzwilliam, the whole of the scarce season in this summer (1800), relieved the poor at his own expence, on his extensive estate in the barony of Shillelagh. The order of this highly respected nobleman to his agent, contained these words, "I insist that you do not spare my money to procure subsistence for the people." The number his Lordship supported was 800, who had oatmeal served to them twice a week.

The price of wages was in general raised by the gentlemen of the country to one shilling per day, which, however, was not without the aid of getting oatmeal, &c. at a reduced price, sufficient for the subsistence of a labourer and his family. Oatmeal was at that time from 37 to 40s. per cwt., a stone and an half of which a week, or three pounds a day, is a very bare allowance for a working man, even subsisting on it three times a day without any thing else, but now and then a little milk. The price of oatmeal at the retail shops was 5s. 5d. per stone, which would make his food at the above rate 8s. 1½d. per week, without any thing for his family. But this price was generally reduced to one half by the gentlemen of the country,

country, and with the advantage, of getting milk from their dairies, the labourers in this county were much more comfortable than the same distinction of people in the towns and villages, where they had not these advantages.

But still much* is required to be done to place the labourer in agriculture, in this county, on that footing which he is entitled to expect in the scale of the community, which, according to the judicious Mr. Smith, ought to be such, "That the joint labour of the man and woman should produce something more than what

* The following estimate was made, when provisions were nearly fifty per cent cheaper than at present.

PRICES OF PROVISIONS.		s.	d.
Oatmeal per stone,	- -	2	2
Potatoes per stone,	- -	0	4
Herrings per dozen,	- -	1	0
Milk per quart,	- -	0	0 $\frac{1}{2}$
Butter per lb.	- -	0	8
Bacon ditto,	- -	0	7
Salt per stone,	- -	0	8
Candles per lb.	- -	0	8
Soap per ditto,	- -	0	8

Quantity of provisions necessary for a man weekly.

		s.	d.
Meal, half a stone,	- -	1	1
Potatoes, two stone and an half,	- -	10	
Fourteen quarts of milk,	- -	0	7
Three herrings,	- -	0	3
Butter, one lb.	- -	0	8
Bacon two lb.	- -	1	2
Salt,	- -	0	1 $\frac{1}{2}$
Candles,	- -	0	3
Soap,	- -	0	3
		5	2 $\frac{1}{2}$

what is precisely necessary for their support." Or in other words, that the labourer should not be a pauper.

In order to investigate this subject a little further and more fully, to comply with the Society's enquiries under this head, I shall take the rate of subsistence at the old prices before the last years of scarcity, as in the foregoing note.

That I may not exceed in this calculation,

	s.	d.
Let the diet of the man daily be,	0	8
That of the woman, - - -	0	6
Of a child, - - - - -	0	3

ANNUAL CLOTHING OF A MAN.

	s.	d.
One great coat in two years -	6	4 ¹ / ₂
Working jacket, - - - -	7	4
Waistcoat, - - - - -	4	10
Breeches, - - - - -	6	6
Two pair of stockings, - -	4	4
Three pair of shoes in two years,	11	4 ¹ / ₂
Two shirts, - - - - -	8	2
One hat in two years, - - -	1	7 ¹ / ₂
	<hr/>	
	2	10 6 ¹ / ₂

Let it be £.2 per annum, or weekly 9d.

ANNUAL CLOTHING OF A WOMAN.

	s.	d.
One gown in two years, - - -	3	3
One petticoat, - - -	4	0
Pair of stockings, - - -	1	8
Two pair of shoes, - - -	9	9
One bed-gown in two years, - - -	1	6
Two shifts, - - -	6	6
Two caps, - - -	2	0
One cloak in two years, - - -	4	4
One hat in two years, - - -	1	0
	<hr/>	
	£. 1	14 0
	<hr/>	

Let it be £1. 10s. per annum, or weekly six-pence halfpenny.

The clothing of the children may be estimated at 10s. per annum, or weekly two-pence halfpenny.

The state* of the labourer in agriculture, in this county, may be estimated as in three different circumstances.—1st. He is maintained by the common farmer, and receives six-pence per day. 2d. He receives 1s. 1d. per day in summer, and 10d. per day in winter.—Or 3d, he receives from gentlemen, when employed all the year round, 10d. per day.

No.

* See Part II. of this Report. Eastern district.

No. I.

State of the Labourer maintained.

	S.	D.
Weekly diet of the man, - - -	4	8
Ditto of the woman, - - -	3	6
Clothing of the man, - - -	0	9
Ditto of the woman, - - -	0	6½

 9 5½

Weekly diet of the man, - - -	4	8
Earnings of ditto, - - -	3	0
Ditto of woman by knitting and a nursed child, - - -	2	9

 10 5

One shilling and eleven-pence half-
penny redundant.

No. II.

State of the labourer employed at 1s. 1d. per day.

	S.	D.
Weekly diet of the man, - - -	4	8
Ditto of the woman, - - -	3	6
Ditto clothing, - - -	1	3½

 9 5½

Earnings of the man, - - -	6	6
Ditto of the woman - - -	2	9

 9 3

Two-pence halfpenny deficient.

No.

No. III.

State of the Labourer at 10d. per day.

Weekly diet and clothing as

above, - - - - - 9 5½

Earnings of the man, - - - 5 0

Ditto of the woman, - - - 2 9

7 9

One shilling and eight-pence halfpenny
deficient.

I have made no allowance for the produce of his potatoe garden* if he has any, nor for a pig, because these are feldom adequate to pay the price of the cabin and the land. Nor do I take any notice of children, and from these three cases adduced, it is evident there is no provision for them. Neither have I made any allowance for fuel, expences of lying-in, or sickness.

If then the joint labour of the man and woman be scarcely adequate to their support, what are they to do?

* In the island of Grenada and most of the new islands in the West Indies the negro slave is enabled, by raising yams and other vegetables on the ground always given to him with his cabin to clear at the end of the year on an average, £.7! The price of land for cottagers in this county is feldom less than three guineas an acre, generally four pounds, and that for land, for which a farmer would not give half a guinea.

do?—They must either deprive themselves of that sustenance necessary for their support, or they must beg or steal!

The only answer, that may be given to these statements, is, the general kindness and charity of the gentlemen of the country, that, where the labourer is annually employed at 10*d.* per day, he is regarded as a member of the family, and receives many advantages denied to those of another description, such as a cabin and potatoe ground rent free, the grazing of a cow, a great coat, or a blanket annually. All this I am very ready to grant, but still, on considering the general state of the labouring poor, it is necessary to keep in mind Mr. Smith's position, and we earnestly hope, that the gentlemen of the country will take the whole of the state of the labourer into their consideration, and exert themselves in having his situation fully ameliorated.

The most obvious and easy mode of amending the situation of the labourer is, by the increase of the price of labour, which ought always to keep pace with the price of provisions.

It seems uncommonly hard, that, when the price of labour to those employed in manufactures is universally increased to double and treble what it formerly was, of that the labourer in land, the greatest of all manufactures, should be kept down or raised only in a very inadequate degree to the expence of his support.

It is in vain to say, that agriculture will not afford equally with manufactures an adequate price for the labour employed in its various operations.

“ Agriculture

“Agriculture may very properly be considered as the art of manufacturing the soil, and unquestionably ranks the highest in the class of manufactures, since it not only makes a *greater return* for the *labour bestowed*, than all the rest put together, but it is also of the first necessity, the demands for its product being urgent and irresistible.”

It is for the improvement of this manufacture of the soil, that the true amelioration of the state of the labourer is to be looked for. It is to this great object, that it is earnestly to be desired the intelligent and active exertions of every gentleman in this island should be devoted.

It has always been the fashion to lay much stress on the difference between a gentleman and an actual labouring farmer, and to allow a decided superiority to the latter, nay, even to deny all possibility of the former deriving profit from the practice of husbandry; and hence gentlemen will tell you, that they cannot afford to increase the wages or price of labour to the people they employ, as their agricultural operations are only from public spirit or pleasure.

“The whole of this is a very improper statement. Nothing can be more true than that the man, whether gentleman or farmer, who determines to remain ignorant of his business, and who indolently suffers himself to be under the guidance of ignorance and prejudice, allowing himself to be *cheated through the nose*, will have a fair chance to be everlastingly unsuccessful. But grant, that the gentleman possesses a moderate portion of the *science* of agriculture, and a decent competency of activity and resolution, and there can be
little

little doubt that the balance will preponderate on his side, whatever may be the quantity of lands from a cabbage garden to a farm of a thousand acres."

"The personal labour and superintendance of the mere common farmer, in the old beaten track, can never stand in competition with the advantages of the new husbandry, of the most productive kinds of live stock, of an ample portion of manure, and of the garden cleanness of the hoe culture."

"I wish to see gentlemen of this country practise agriculture for profit, and viewing it in a trading light, it certainly makes as ample a return for the use of money as any employment of money in manufacturing industry, or any domestic concern whatever. And although it is not been hitherto the general practice, it is easy to prove, that very great capitals, to the amount of twenty, thirty, or forty thousand pounds and upwards, might be safely and prosperously employed upon an extensive farm."

SECT. 4. State of Tithe, its general amount on each article—What articles are exempt, and what charged by modus.

THERE are no tithes on agistment in this part of the United kingdom. I could not ascertain its amount on each article; some of the clergy refused to give me an account of it, as they did not wish to disclose their income. Some take their tithes by a very moderate *modus,*

modus, which they have not attempted to increase, although they might double and treble their livings by so doing. Nor did I find, that any of the very respectable clergy, of which this county consists, had taken any advantage of the rise in the price of grain, but uniformly charged the old prices, in the valuation of their tithes, in general about one-third of the present market prices for the produce of the land.

SECT. 5. *Use of Beer and Spirits—Whether either or which is increasing.*

THE use of spirits, on account of the high price, is, very happily for the lower classes, almost totally abolished. This county was formerly remarkable for excellent ale, particularly the Wicklow ale, celebrated by Mr. Young for its prolific virtues; but, although I did not hear of any decrease of the latter circumstance, I could not find the ale had maintained its reputation.

SECT. 6. *State of Roads, Bridges, &c.*

THE roads are in general uncommonly good, both the direct and cross roads. They are also accommodated with convenient bridges.

SECT.

**SECT. 7. Nature of Soil—of Mines—Minerals,
Clays, &c.**

FOR this we must refer to the foregoing parts of this Report.

SECT. 8. State of Navigations, and Navigable Rivers.

THERE are no internal navigations in this county. There is a line of navigation very practicable in the southern part of the county, to form a communication with the limestone quarries in the county of Carlow, and the collieries of the county of Kilkenny, to which I have endeavoured to attract active attention in the gentlemen of the county. The rivers are not navigable.

SECT. 9. State of Fisheries.

AT Arklow there are forty-five boats employed in the herring fishing every season; six hands in each boat. From eighty to one hundred mease of herrings taken by each boat during the season. Average price, 14s. per mease. The rent of the fishermen's cabins from £.3 to £.5. Some pay one shilling per year for the ground and build themselves*. Their children are employed during the dead season in making nets, and

* This we understand has lately been granted to the fishermen by Lord Carysfort.

and when the herring season is over the boats are employed dredging for oysters, which are carried to Liverpool, and coals and earthen-ware brought in return. Oysters sell at eight-pence per hundred, or six shillings by the thousand.

If the herring season should prove boisterous, the profit arising from the draughts of fish is very inconsiderable, as from the wretched state of the harbour their boats are liable to be much damaged and often totally wrecked. This harbour at a very small expence might be made both safe and convenient for boats.

SECT. 10. *State of Education—Schools, and Charitable Institutions.*

Mrs. Tighe, of Rosanna, has the honour of being the first, who established female orphan schools in this county. Mrs. Latouche, to her school for female orphans, has lately added a day-school in the village of Delgany, where she has proper mistresses to teach any of the children, and young women of the parish, who choose to attend, all manner of plain work and spinning, in addition to reading and writing.

In the parish of Wicklow the gentlemen are arranging a plan of education, on a very interesting scale, for the lower class of children in the parish.

There appears every where, amongst the numerous opulent inhabitants in this county, every disposition to encourage charitable institutions of every kind. The

late lamentable insurrection and rebellion has, indeed, driven away many from the country, which in all parts of it, particularly the eastern side, formed the happiest neighbourhood in the island.

With the re-assurance of tranquillity, families are beginning to return to their residence in this delightful district. With a truly amiable spirit, gentlemen in this county seem every where willing to forget the horrible rage of desolation of the deluded wretches, whose conduct has so fully disgraced the page of human nature.

It seems the general point of emulation to do away every pretext, if any pretext there can be for the desperate abettors of anarchy, again to make a prey of bigotry and superstition, and to lead their miserable devotees to destruction.

SECT. 11. *State of Absentee and resident Proprietors.*

NEARLY two-thirds of the county, I believe, belong to proprietors, who may be considered as non-residents, although some of them occasionally remain in the county for a short time.

SECT. 12. *State of Circulation of Money or Paper.*

CIRCULATION wholly paper. Small change in very bad silver, which, in this and every part of Ireland, is a very distressing circumstance to the poor, and a great inconvenience to the internal commerce of the country.

SECT. 13. *State of Farming or Agricultural Societies.*

AN Agricultural Society has been instituted this year (1800), which promises to be of great advantage to the husbandry of the country. Some very spirited experiments are already in progress, in different parts of the county, the result of which will be of much importance, and will form an important head of communication in the re-publication of this work.

SECT. 14. *State of Manufactures, whether encreasing—
Of Encouragement to them, and the peculiar aptness of
the situation for their extension.*

AGRICULTURE, as we have in a former Section of this Report already observed, may very properly be considered as the art of manufacturing the soil.

In this point of view the *seed grain* may be said to constitute the *raw material*. When the corn and straw are dressed and sent to market, the greater part of it is then fit for consumption, and *may be called a finished manufacture*.

Taking then the *seed grain* at 25*s.* the additional value above this is entirely the produce of labour, which I consider amounts in the best arable land in this county to £.11. 15*s.* an acre, or £.900 per cent. on the cost of the raw material. In other counties the average is considerably higher than here stated.

From what species of manufacture then is so great a return to be made?

In the manufacture of land we have indeed the assistance of that fair handmaid Nature, who demands no price for her favours, but only that assiduous courtship, which excludes any rival from participating her genial influence. At her shrine labour must be our constant attendant; she demands employment for the child of indigence, and will not fail to reward the employer with the horn of plenty.

Other manufactures cannot support their own population, but on the contrary have a tendency to shorten greatly the duration of life. It is therefore to Agriculture's healthy sons we must look for a supply, to make up the loss experienced in manufactories, in great cities, in commerce, and above all in war. Agriculture alone is the only certain and ultimate resource of the state. From hence only is to be derived health, wealth, and strength.

If the great landed proprietors, amongst whom the greatest part of this county as well as most others in Ireland is divided, could be led to act upon the conviction of the great truth, that their interests and that of the community are one and the same, as a family interest can only be permanent with the permanent interest of the community, they would earnestly unite in every effort to bring those improvements of agriculture, the advantages of which are now so well established, into general practice. Nor would they rest, until by every encouragement and attention every acre of their estates should be brought into that state of manufacture and garden-like culture, which would not only

only support the present population in comfort and strength, but thereby enable the country to support any future increase of population, until we covered (as is said to be done in the island of Japan,) the mountains with soil from the vallies, to enable them to produce food in abundance, and until we drained the surrounding ocean of her finny race, to form a nursery of force and strength, to defend us from danger, and humble the pride of every foe.

There are, however, some manufactures, which by being domestic deserve the attention of even a country purely agricultural. One of these has already formed her seat in the northern part of this island, viz. the manufacture of flax. The South seems most adapted to that of wool, and this also has made no inconsiderable progress. In this county a kind of frize, and ratteen of pretty good quality, is very generally made for domestic uses, and considerable quantities are annually sold at the fairs.

In the Southern part of this county also a considerable quantity of flannels are manufactured, of which the following quantities were annually sold at the hall built for that purpose by Earl Fitzwilliam, at Rathdrum, for four years previous to the breaking out of the late rebellion in May 1798.

Account of Flannels sold at the Hall of Rathdrum.

	PIECES.
January 1794 to 1795, (inclusive)	5,329
To January 1796, - -	5,556
To January 1797, - -	7,304
To January 1798, - -	3,927
From thence to and for May, 1798,	2,143
	<hr/>
<i>Total,</i>	24,259

The

The hall being occupied as a barrack ever since the month of May 1798, no account has been taken of the sales. It is observable, that the year previous to the rebellion there was a considerable deficiency, which was observable in every other species of industry, the people's minds being taken up with the contemplation of the insurrection, for which they were secretly preparing. The average of the three preceding years ending in January 1797, at 120 yards to a piece, and 1*s.* 8*d.* per yard, gives the average amount at £.50,624 annually.

But instead of the woollen business in this country being carried on in a small way, there seems every reason to expect, that there will be very speedily various branches of the woollen manufacture established in Ireland.

It has been said, in opposition to this, that the wool in Ireland is not fully sufficient for the demand for the domestic manufactures already carried on. This, however, is a very fallacious proposition, as by the act of union English wool is allowed to be imported duty free.

If, therefore, the Irish woollen manufacturer* was able to supply the home market before the union in
coarse

* There has been for many years in this county an establishment at Greenane, near Rathdrum, for carrying on the manufacture of superfine woollen cloths, in which the Messrs. Allens, a family from the west of England, have made a very considerable capital. This establishment was burnt to the ground in the rebellion, by which the proprietor sustained a loss of upwards of 5000*l.* His claim for the losses he sustained,

coarse woollens, and also, which has been the case of late years, to supply the Dublin and other markets with a great proportion of woollen goods, he has now the following additional advantage in his favour :

Suppose

sustained, was, I have been informed, rejected by the commissioners, which is very unfortunate for the country, as well as for the proprietor. But it was hoped, that some public aid would be granted, to enable him to renew this means of employing the people, which amounted to upwards of 300 persons, of the following descriptions :

Wool-sorters and women assistants	-	-	10
Scourers, dyers, &c.	-	-	6
Belonging to the machine-room	-	-	20
Jenny-spinners, reelers, &c.	-	-	30
Weavers, and assistant warpers, winders, &c.	-	-	90
Millmen, gig mill workers	-	-	6
Sheermen, pressers, &c.	-	-	12
Carriers, labourers, &c. immediately employed in the business	-	-	12
Clerks, and under-assistants to attend the works	-	-	6
Burlers, nickers, &c.	-	-	8
			<hr/>
			200
Additional workmen would be necessary, when employed as a superfine manufactory	-	-	58
			<hr/>
			258
			<hr/>
Persons employed in an establishment on the scale of Messrs. Allens, immediately in the works	-	-	258
But taking the other persons remotely employed, as soap-boilers, machine-makers, smiths, &c. &c. the advantage to the employment of the people of a manufactory on such a scale, cannot be taken at less than one-fifth additional	-	-	51
			<hr/>
Forming the number depending on such a manufactory	-	-	309

Suppose English wool cheaper than Irish - - - - -	£.40 per ct.
Deduct 8 per cent on importation, expences, &c. - - - - -	8
	<hr/>
Present advantage in favour of the manufacturer - - - - -	32
	<hr/>
Take only one half of this on the whole value of the cloth	16
	<hr/>
	16
Coarse cloth pays an import average duty - - - - -	6
	<hr/>
	22 per ct.

The Irish manufacturer has then a clear advantage of above 20 per cent, above what he had before the act of union. To which is to be added, cheapness of labour, advantage of falls for machinery, in many situations, also abundance of turf for fuel, and coals not unreasonable.

But the highest of all proofs, that the union is favourable for the establishment of branches of the woollen manufacture is, that several very respectable houses in that manufacture in England, have been enquiring to find out proper places for carrying it on, and I am informed several establishments are already forming in different parts of Ireland.

It is impossible there can be any invidious wish now to check the prosperity of Ireland, or any manufacture here:—and it is now perfectly well understood, that national capital and national industry can be extended, and participated without being diminished.

With

With regard to the encrease of the wool as the raw material, I am perfectly of opinion, that the breed of sheep may be encreased in this county to a great amount, and that by the introduction of turnip husbandry, and sheep, the mountain lands may be made to return a great value to the proprietors, as well as be thereby an additional source of wealth to the community, and of employment to the people.

SECT. 15. *State of Mills of every kind.*

AT Newtown-mount-kennedy there is an excellent flour and bolting-mill, built by Lord Rossmore. In general, however, there is a great deficiency of mills in this county, although no district in Ireland abounds with such numerous streams and excellent falls for mills, and every species of machinery.

SECT. 16. *State of plantations and planting—Of the effects of the encouragement heretofore given by the Society, particularised in the list annexed—Of any improvements, which may occur for future encouragement, and particularly for the preservation of trees, when planted.*

BEFORE the late unfortunate disturbances, planting was going on rapidly in this county, and a number of candidates applied for the premiums of the Society annually. Some destruction has inevitably taken place in

in the plantations so made, on account of the residence of all those, who were near the mountains, and who had received the premiums (as it is adjacent to them here planting has chiefly taken place) being destroyed: the fences being also impaired, cattle had injured them. However the plants all seemed thriving, particularly at the Marquis of Waterford's lodge, where there is a fine screen of planting, extremely well disposed on the brow of the mountain adjacent to the ruins of his lodge.

Many of the farmers complained to me, that the premiums of the Society did not extend to smaller spaces than ten acres, as they could not always spare ten acres, in one place for planting, without encroaching on their best meadow or pasture ground. If premiums were granted by the Society, or the Farming Societies of the different districts, to small tenants, and even cotters, for planting a rood or two round their cabbins, as is doing by Lord Fitzwilliam, it might have the effect of giving the lower class a love for trees, and be a greater means of preventing their wanton depredations on them than any penalties.

SECT. 17. *State of Nurseries within the county, and extent of Sales.*

THERE are no nurseries of any considerable extent in the county.

SECT. 18. *Price of Timber, and state of it, in the County.*

THE woods in this county principally consist in coppice woods, which are usually cut at 30 years growth, at which time they are worth, if judiciously thinned, and preserved from cattle, 70l. an acre. The thinnings will produce 17l. an acre, which makes the whole of the value 87l. an acre. Most of the woods belong to absentees, and, besides the frequent depredations of cattle, are neglected until they reach twenty-five or thirty years growth, at which age they are generally felled, what is commonly called *smack smooth*, worth about 30l. an acre. Or if a few reserves are left, they are sure to die in a short time, for want of their accustomed shelter, being too much drawn up. This very often brings disrepute on the practice of leaving reserves, the failure of which, however, has arisen solely from the want of timely and judicious thinning. Thinning woods, at stated periods, is of more consequence than is generally imagined. A remarkable instance of this has occurred in the southern part of this county to a friend of mine. This gentleman has a wood near Rathdrum, consisting of twenty-five acres, nearly two of which are waste. It was felled by the present proprietor's father, about thirty-three years ago, then thirty-two years growth, and had never been thinned. There were only 120 reserves left along the
bank

bank of the river. It was sold for 300l. The wood when felled was carefully coped up from cattle, until it received its first thinnings, which it did at 16 years growth; it then produced wattles for kishes (large baskets for carrying turf), cordwood, and some hoops; also about 150 barrels of bark. After paying all expences of labour, &c. the profits netted 100l. In 10 years after it was thinned again, and produced poles fit for roofing cabbins and railing, together with 350 barrels of bark. The clear profits amounted to 320l. The two sums together make 420l. which gives 17l. 9s an acre. The wood was valued this year (1800), and the valuation amounted to 1650l. or nearly 72l. an acre. Now allowing the price of bark, poles, and cordwood to be worth double what they were 33 years ago, the time it was last felled, and allowing upwards of 200l. for the reserves, the wood will have encreased its value to the proprietor of rather more than 3 to 1.

The above-mentioned coppice is situated on a very steep and rocky brow.

Thinning coppice wood is only to be entrusted to a careful and honest woodman, a description of people not sufficiently known, or encouraged in this county. This gentleman happens to have one uncommonly skilful, and trained up in his family, at this business, from his childhood.

From the same gentleman I have been favoured with an account of the management, which has generally been pursued with regard to the woods on his estate.

The

The number of reserves usually left on an acre, at 30 years growth, which is the first fall, have been 60, worth 3s. each, which in 30 years more, the second fall, are worth 2l. 10s. each. Of these 20 are left to 90 years, the third fall, worth then 60l. each on an average. A few have been left to the fourth fall, 120 years, but they have not encreased in value at all equal to the third growth, or even the second, being worth not more than 9l. or 10l. each. This demonstrates, that the great increase of improvement declines at about 100 years growth. It may, however, be worth while to leave a few of the above description for ornament. The calculation is as follows :

1. *At 60 years growth.*

Coppice wood, deducting 10l. on account of the overstands, and 50 young ones reserved for the next fall, worth 3s. each	£. s. d.
40 Reserves, allowing 20 to stand for the next fall, worth 2l. 10s. each	52 10 0
	- 100 0 0
	<hr/>
Produce at 60 years growth	152 10 0

2. *At 90 years growth.*

Coppice wood, deducting 20l. on account of overstands	50 0 0
50 Reserves, at 2l. 10s. each	125 0 0
20 Do. at 7l. each	140 0 0
	<hr/>
Produce of fall at 90 years growth	315 0 0
Add	152 10 0
	<hr/>
Total produce per acre	467 10 0

The first fall, it must be recollected, was only valued at 70l. an acre, which if cut, without leaving reserves, would produce at the end of 90 years, only 210l. whereas by leaving reserves at the loss of only 16l. 10s. it will produce 467l. 10s.

But the great advantage of early thinning will prove itself more fully by the following calculation :

Produce by thinning per acre	-	17	9	0
Do. by the first fall, deducting 9l. for reserves	-	61	0	0
Do. by reserves, &c. in 90 years	-	467	10	0
		<hr/>		
Produce of one acre by thinning & reserves		545	10	0
Produce of wood without thinning, and making reserves, according to the present barbarous practice	-	120	0	0
		<hr/>		
Clear gain per acre by the above management		425	10	0

Valuing a wood at the highest, at 30 years growth, cut down without thinning, is 40l. an acre; in three falls it will only produce 120l. as above.

The actual loss suffered, therefore, by the mismanagement of the woods of non-residents in this county, for these last 90 years, taking them only to amount to 2500 acres, amounts to the sum of 1,063,750l.

If I were to enter into a calculation to shew the further losses sustained by this description of proprietors, from neglect of planting waste and unprofitable lands; from the neglect of cultivating lands to their utmost; from the want of draining, clearing the lands of rocks, &c.

&c. it would appear hardly credible, and fully demonstrate, that owners of estates, in this part of the united kingdom, would be amply recompensed for the trouble of residing a little more on their properties than they have been accustomed to do, and with that the advantage of employing able and intelligent men to conduct their improvements, and manage their estates. By granting well advised leases, and timely renewals; by a liberal treatment of their tenants, and by full encouragement to the industry of all descriptions of the inhabitants on their estates.

—— Procrastination is the thief of time ;

To-morrow and to-morrow ;

Still Lothario 'tis to-morrow.

SECT. 19. *Quantity of bog and waste land—Possibility and means of improving it—Obstacles to it, and the best means of removing them.*

THERE is a tract of many thousand acres of boggy land in the central mountains of this county. In the low ground, also, there are many small pieces of bog, which are very useful to the inhabitants in supplying them with turf for fuel. In the southern district, there is a tract of several miles in length, called the Derry bog, extending through the whole of the barony of Shillelagh, and the district of Cashaw.

The vast tract of boggy land in the central district has hitherto been in a great measure inaccessible, from
the

the want of a road. The military road now forming leads directly through the centre of this tract, and will open it to the enterprize of individuals.

A great part of this mountainous tract of boggy land consists of peat, of more or less depth and consistence. That, which contains the brown spongy peat, consisting of vegetable matter not sufficiently decayed or compressed, is the most difficult to be improved, as it holds water like a sponge; and even when you form the drains, the adjacent turf does not let go its water, and would seem to require some heavy substance to compress it, in order to drain it completely of its moisture, which is necessary previous to its being rendered fertile by the addition of calcareous substances. This kind of turf, however, is by no means the most extensive in this tract. It is generally of the black solid peat, which is far more capable of being drained. This has, indeed, been proved to a great extent in making the military road, where the drains, made under the judicious direction of Captain Taylor, have had the complete effect of drying the adjacent grounds, and rendering them consistent, and capable of bearing people on their surface in those places where before they were impassable. The means of improving peat ground, by limestone gravel, marl and lime, is only a late discovery, and amongst one of the most important in modern times. In order to facilitate the improvement of this tract, this road, which we have before mentioned, will do a great deal, by enabling limestone and limestone gravel to be brought from the low lands adjacent, and affording a back carriage for turf.

I also

I also observed here, that at Shranamuck, a place where an iron smelting furnace is said to have been formerly erected, a great variety of deep drains have been made, and in the fields or spaces intersected by these drains, the superior luxuriance of the grass was very evident; so that it would appear, that by draining alone, this tract of boggy ground would be greatly improved.

There is, however, in all this tract, a great extent of dry ground, very well adapted for sheep; and the greatest and most immediate means of improvement, seems to be that of introducing the Cheviot sheep, which have been found by experience to thrive well on the wet mountains in the Highlands of Scotland, which are by no means equal in fertility to the tract of land we have observed in this county, and which, with the introduction of the turnip husbandry into the adjacent vales, and lower grounds in the mountains, will render this tract of great value, which hitherto has been considered of hardly any other use than that of supplying turf for fuel.

SECT. 20. *Habits of Industry, or want of Industry amongst the People.*

I FOUND every where a general complaint, that on days wages the labourers did not do a sufficient quantity of work for the gentlemen who employed them, but every where, when they worked on task wages,

they did a great deal of work. Nor amongst the common farmers who fed them well, and worked with them themselves, did I find any deficiency in the quantity of labour they performed. In general the people, of all descriptions, seem inclined to industry more than otherwise.

SECT. 21. *The use of the English language, whether general, or how far increasing.*

IT is very remarkable, that although the Irish language is common in all the counties around, in the county of Wicklow the Irish language is unknown.—Nor did I find any of the natives of this county, even in the most remote vales in the midst of the mountains, accustomed to speak the Irish language.

SECT. 22. *Account of Towns, Castles, Monasteries, &c.*

THIS I must leave to the Antiquarian, as it would lead to too much discussion for the limits of this work.

SECT. 23. *Whether the county has been surveyed.*

IT has, and a map published by Nevill, at the expence of the county.

SECT. 24. *Weights and measures.*

POTATOES, 20 stone to the barrel—Wheat, 20 stone—Barley, 16 stone to the barrel—Oats, 14 stone to the barrel. Other measures I have explained as they occurred.

Nature and Use of Implements of Husbandry.

The most interesting object on this subject is the introduction of the drill plough into this county. The Rev. James Symes has one of M'Dougall's construction with three coulter. Mr. Clements and Mrs. Tighe have one each, of the Rev. Mr. Cooke's drill plough.

The experiments now making with these implements will shew the farmers of this county the advantages resulting from this excellent mode of management.

The advantages of the drill husbandry may be comprehended under the following heads.

1st.—By sowing the grain and particularly wheat in rows, scattered by a drill plough at regular distances, and buried at a regular depth, the grain is neither crowded nor too thinly dispersed.

2d.—Nor are the roots buried too deep in the soil nor too shallow.

3d.—By turning the soil first from the rows in the spring for a week or two, and then turning it up against the rows, the soil is exposed to the atmosphere, by which it is brought into a greater state of pulverization, and is probably impregnated with the food of plants.

4th.—It becomes more penetrable by the superficial roots of the corn.

5th.—By raising it to the second joint of the corn stems, four or six, or six new roots with new stems will shoot out, which without this heaping up of the soil against the plants would not take place.

6th.—The complete destruction of weeds by the hoe, so that the whole of the nutriment of the soil goes to the production of the grain alone.

It must always be remembered that it is from the hoeing between the rows that the great advantage of this husbandry arises, in this respect Mr. Tull the original author of this system, and his disciples the Rev. Mr. Cooke, Mr. Exter, and others, have always preferred horse-hoeing, on account of its going deeper into the soil, and more completely loosening it and pulverizing. The disadvantage of the horse-hoe is that the rows must be placed at too great a distance. Of late, therefore, it is supposed that a great improvement on the drill husbandry is made, by the introduction of the hand-hoe, in place of the horse-hoe, and which I understand is now brought into almost general use in Norfolk by Mr. Coke.

“ Mr. Coke, of Holkam in Norfolk, assured me that in thirteen years experience on a farm of 3,000 acres, he had found the drill husbandry in that country greatly superior to sowing seeds of all sorts by the hand, in what is termed the broadcast method, but differs in the number and arrangement of his rows, from the method of Mr. Tull, in the following circumstances.”

“ Mr. Tull drilled two rows of seed a few inches from each other, and then left a space of two or three feet, and then drilled two more rows near each other, for the purpose of passing the hoe between each double row drawn by a horse, which was therefore termed a horse-hoe; but Mr. Coke drills all his rows of

of wheat and of peas nine inches from each other, and those of barley six inches and three quarters from each other; this is performed by the drill plough of the Rev. Mr. Cooke, which drills six rows at a time, and thus sows an acre of land in an hour, and is drawn by a single horse, and the quantity of seed consumed is about six or seven pecks to an acre, which is about half the quantity used in sowing by the hand in the broadcast method."

"Early in March Mr. Coke uses the hand-hoe, which for hoeing the rows of wheat and of peas is about six inches wide, and for hoeing those of barley about four inches wide. By this hoe the surface is not only turned over and the weeds between the rows rooted up, but it is also accumulated about the roots of the growing corn and covers, and consequently destroys the growth of poppies amongst them, which is a very common weed in that part of the country."

"A second hoeing is performed about the middle of May, and the soil is again not only cleared from weeds, but is accumulated against the rising corn, each of which hoeings cost about 1*s.* 8*d.* an acre."

By the earth being thus accumulated against the roots of the corn it is said to tiller or tellure much, that is, to throw out four or six stems or more, around the original stem, and thus to increase the number of ears like the transplanting the roots, inso-much that Mr. Coke obtains by this method between four and five quarters of wheat on every acre, which in the broadcast method of sowing did not yield more than three quarters on an acre, besides saving a strike

and

and a half of seed corn, unnecessarily consumed in the broadcast method of sowing. To this should be added another advantage, that as the land is thus kept clear from weeds and has its surface twice turned over, and thus exposed to the air, it is found to save one ploughing for the purpose of a succeeding crop of turnips*.”

This practice of hand-hoeing seems to be well calculated for throughing up the soil against the plants, yet Mr. Exter and others who practice with great attention the drill husbandry, have assured me that they find no disadvantage in using Mr. Cooke's horse-hoes (which are appendages to his drill plough) in the narrow interfections between the rows of corn drilled at nine and seven inches distant from each other. The scarificators, which are triangular shares, they also highly approve. Nor do they find that any accidental trampling of horses does any injury to the corn, but rather the contrary.

Of the experiments made by the Rev. Mr. Symes, of the comparative advantages of the drill and broadcast modes of husbandry, I hope to be able to relate the result before this work is out of the press, from the actual measurement of the quantity arising from the seed sown in each manner. And although these experiments may not be considered as entirely conclusive, they have this advantage, that it will shew how easily they may be tried. On the whole of the subject of the drill and broadcast methods, the excellence

* Darwin's Phytol. page 38. Lond. Ed.

lence of the drill and hoe culture in turnips, rape carrots, pease, beans, and in short, all root and pulse crops, seems perfectly established; but there is still much difference of opinion whether in grain crops, as wheat, barley, oats, it deserves all that preference, which many individuals from their experience have given to this practice. I have lately been assured by a gentleman who has himself been a practical farmer for thirty years, that from the most assiduous attention to this subject, literally ploughing the ground and sowing the seeds with his own hands, that he considers the broadcast husbandry *for his grain crops* as very superior indeed to the drill on clean ground, after pulse root and green crops. That he also totally disapproves of encouraging grain crops to tiller or throw out new roots with new stems, which happens by heaping up the earth to the second joint of the stem, and he adds, that by plants being thus encouraged to throw out these new roots and stems, the principal stems are deprived of their requisite powers of nourishment, and also by occasioning the crop to ripen unequally, and waiting for the ripening of these new stems or younger brothers, the grain in the principal or original stems becomes over ripe and full of bran, and he is certain that there will be more actual produce in *weight of grain, and quantity of flour* from the *three or four original stems*, than from *those*, and the *four or six new stems*, thus produced by heaping up the earth against them.

This opinion, coming from a man not only of a thorough acquaintance with science, but from the re-
sult

fult of long and attentive actual practice, carries with it the greatest importance ; and although it should by no means discourage further trials, yet it has this great consolation with it, that by very superior preparation of the ground, a farmer need not despair of abundant crops, even although he cannot put the drill system in practice, with regard to grain.

And if, indeed, upon full investigation, and extensive experiment, this gentleman's opinion should be confirmed, the drill and hoe system, for these crops, should be given up.

This gentleman has also invented a new, and very handy drill machine, for beans, pease, turnips, and other small seeds, and which will answer also for grain, constructed on the most perfect mathematical principles, which may be seen at the Dublin Society House, under the name of the SEMINATOR, and may also be purchased at Nugent and Orson's, Henry-street, Dublin.

It sows all kinds of seed, with the most perfect accuracy and correctness, and can be had at a very small expence. As none of them have as yet been sold, the price was not fixed, but I understand the price is to be two guineas and a half. It is perfectly simple, and not liable to go out of order, and may be managed by a child, the drills previously marked by a light plow ; which mode of drilling is, I am inclined to think, the best, and has long been practised by Mr. Duckitt, of Esher, in drilling all

kinds

kinds of seed, instead of making the drill by the coulters of the drill machines.

P L O U G H S.

THE common plough in use in this district, is the *swing plough*. It is feldom, however, formed on any scientific principles, and is generally very clumsy, and ill adapted for making clean or regular work.

On the construction of the plough, vast improvements have been recently made, particularly by Mr. Small, which has been brought to so great a degree of perfection, by the addition of a cock or bridle affixed to the beam, and connected with the beam behind the coulter by a chain, that you can add to or diminish your furrow even to the eighth part of an inch.

As it is by no means easy to explain the form or principle of the construction of the plough by drawings, it is better to refer the reader to the plough itself, which he will see, with the form and construction of the bridle, at Henry-street, as above.

C A R S.

THE single horse-car is chiefly used in this county, and is so well known, as not to need a particular description. It is generally considered here, that a horse with a car, draws about six hundred weight, and they

are held to be peculiarly adapted to a mountainous country. The single horse-cart, however, on the construction made use of in the South of Scotland, is a much better carriage, and will enable a horse to draw double the weight they commonly do on the car.

Furze Breaker or Furze Mill.

THIS machine has been introduced into this county, by the Reverend James Symes, being constructed under his direction, from a drawing sent him from Wales by a common country carpenter. A boy, with this machine, will feed it, and break a sufficient quantity in a day to feed seven horses, which quantity, being the tops of the furze, a man will cut in two hours, nor do the horses, when fed on this, require any oats. Mr. Symes feeds in this way his working horses the greatest part of the winter. He sent a model of it to the Dublin Society, from which Nugent and Orson have constructed them, with an improvement of making cast-metal instead of wooden wheels. I am informed it is sold by them at four guineas. In Wales, they form them to move with a horse or with water, and break furze for the neighbouring farmers at a low price.

Kentish-turnwrest Plough.

THIS plough was introduced into this county by the late Marquis of Rockingham, who sent to his estate,
in

in the barony of Shillelagh, the old Kentish farmer, who is mentioned by Mr. Arthur Young, as the conductor of the Kentish farm established by his Lordship at Wentworth. The Reverend Mr. Symes has one made from the plough brought over, and has found it of great use in ploughing up tough ley grounds, which have not before been turned over by the plough.

C O N C L U S I O N.

I HAVE thus endeavoured, so far as my information and ability enabled me, to give an interesting view of the county of Wicklow; together with such observations as presented themselves to me at the time, which I thought might lead to further improvement.

It will not be expected that I shall say much in extenuation of the many imperfections it contains. More time would have enabled me to render it less unworthy the acceptance of the public. But the views of the Society leading to immediate improvements, would not perhaps been so well answered by delay. It would be very desirable, that the Reports from other counties were also made out, in order to consider if some great general measures might be adopted to accelerate general improvement.

Feeble, and perhaps unavailing, as is this attempt to excite attention to the improvement of this county, I hope it will be received with that candour which the
public

public are ever ready to bestow on well intended endeavours to promote the public service. I beg also that the gentlemen of the county will accept of my best thanks, for their kindness and assistance during my progress, and of my best wishes for the improvement and prosperity of the county of Wicklow.

ROBERT FRASER.

FINIS

I N D E X

TO THE

COUNTY OF WICKLOW.

- A**GRICULTURE, connection of mineralogy, and chemistry with, 45.
-
- , The art of manufacturing the soil, 253.
-
- , Superiority of, in profit to manufactures, 259.
- Agents, qualifications of, 223.
- Argillaceous strata, 11.
-
- , district, 100.
- Archer, Mr. his average of produce, 71.
- Arable land, laying down to grass, 191.
- Argyle, Duke of, mode of hay-making, 208.

B.

- Bog, means of improving, 271.
- Belview, improvements of, 64.
- Breed of cattle, 182.

C.

- Coke, Mr. of Holkam's, drill husbandry, 276.
- Country, beautiful view of, 29.
-
- , population of, 240.
- Carbon, chief food of plants, 230.
-
- , formed by slow combustion, 232.

Climate

INDEX.

C.

- Climate, means of improving, 4.
Cheviot sheep, letter from Sir John Sinclair on, 99.
Clover, red, management of, 189.
Crops, best course of, 142.
Cultivation, great principle of, 147.
Cooke, Mr. mode of improving coarse pasture, 130.

D.

- District, eastern alluvial, 46.
——, western alluvial, 78.
——, southern argillaceous, 100.
——, central granite, 98.
Downs, Glen of, 63.
Darlington, Robert, account of his successful industry, 69.
Dargle and Powerscourt, 49.
Draining, its great importance, 226.

E.

- Extent of the county, 1.
—— of culture,
Estimate of the expence of marling, 82.
Expence of premiums for cultivating wastes, 84.
Estates, mode of management recommended, 271.
——, Lord Fitzwilliam's admirable custom on, 120.
——, value of, may be greatly encreased by proper agents, 223.

F.

- Food of the poor, 55—242.
Farms, their size and observations on, 213.
Fairs and markets for cattle, 184.
Fences, nature of, 226.
Fisheries, state of, 256.
Farming Society, 259,
Furze-breaker, 282.

G.

- Granite, metals seldom found in, 31.
——, exceptions to this, 32—33.

Gold

INDEX.

G

- Gold mine, 19.
 Gravel, limestone, enquiry concerning, 72.
 Grasses, natural, 185.
 ———, artificial, and best mode of managing, 186.
 ———, best mixture of, 187.
 ———, a knowledge of, indispensable, and how to be obtained, 188.

H.

- Heathy mountains improved, 87.
 Husbandry, drill, introduced, 113.
 ———, new and old, explained, 128.
 Habitations of the lower rank, 242.
 Habits of industry, 273.
 House lamb, management of, 209.

I.

- Implements of husbandry, 275.
 Interesting calculations on the value of woods 269.
 Importance of abundance of water, 89.

K.

- Kennedy, Mount, 67.
 Knowledge of the composition of soil necessary, 46.
 ——— advantages of, superior to mere labour, 254.

L.

- Lamb, house lamb, management of, described, 209.
 Labourers, section on, 242.
 Land steward, his qualifications described, 223.
 Leases, section on, 220.
 ———, further observation, 119.

M.

- Manures, commonly used near Powerscourt, 57.
 ———, Animal recommended, 142.
 ———, Various observations on, 131, 147, 124, 229, 234.
 Mountains,

INDEX.

M.

- Mountains, and general strata, 5.
Mode of culture, 123.
Marle, its use and application, 130.
Mills, state of, 265.
Marle and limestone gravel, abundance of, 46, 68, 72, 78,
80, 87.
Manufactures, section on, 259.
———, Inferior to agriculture, 260.
———, Woollen, advantages possessed by Ireland for carrying it on, 262.
Measures, and weights, 274.
Middlesex, mode of hay-making recommended, 201.

N.

- Nature and composition of soils in this district, and means of their improvement, 125.
New husbandry explained, 128.
Nature of pasture, 178—Means of improving it, 180.
Nature and use of implements in husbandry, 275.

P.

- Paring and burning, 234, 180, 160, 232.
Parish of Powerscourt, interesting particulars with regard to, 53.
——- Castle M^cAdam, 101.
Preliminary observations on the objects of the work, 45.
Powerscourt, 49.
Population, section on, 240.
Price of provisions and labour, 242.
Plantations and planting, 265.
Ploughs, 284.

R.

- Rivers section on, 35.
Rape, culture of, 174.
Red clover, proper management of, 189.

S.

- Strata, general, 5.
———, granite, 6.
———, hornstone, 8.

INDEX.

S.

- State of calcareous, 9.
——, argillaceous, 11.
——, metalliferous, 13.
Summit of Lugnaguilla, 29.
Southern district, section on, 100.
Size of farms, interesting observations on them, 216.
State of leases, 220.
—— tithe, 154.
—— navigations, 256.
—— fisheries, *ibid.*
—— education, &c. 257.
—— manufactures, 259.

T.

- Tares, cultivation of them earnestly recommended, 149.
Turnips, best modes of cultivating, 156.
Tithe, state of, 254.
Towns and villages, 241.
Timber, state of it in the county, 267.
——, calculations, showing the advantage of attending to
it, 269.

V.

- Vetches or tares, mode of cultivating, 149.

W.

- Watering, 237.

ERRATA AND ADDENDA.

Page 31, line 24, for "*years of months,*" read "*years instead of.*"

Page 62, line 22, for "*landing,*" read "*taking up.*"

Page 68, line 10, for "*more ornament,*" read "*more from.*"

Page 73, line 5, for "*bed, is covered,*" read "*be discovered.*"

——, line 23, for "*for fragments; ended,*" read "*fragments ended.*"

Page 74, line 22, for "*Roadsteads,*" read "*roadstead.*"

Page 194, line 25.—Since writing this paragraph, I have been informed that there has been invented a leather tube, which is put down the beast's throat, till it enters the stomach, through which the air generated in the digestion of the clover is discharged, without the necessity of having recourse to those operations which are commonly in use, and which, even if ever so well performed, give much torture to the animal.

RDS